

A Methodology for Evaluating Housing Programs in Egypt

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Abstract The recent period has witnessed significant theoretical developments in the area of evaluation, with its various types and tools, as well as approaches used in its implementation, which are used in various fields, particularly in urban planning. Although there has been a breakthrough achieved in the use of these tools globally and internationally, there is no way to apply them to Egyptian urban patterns in general and the housing sector in particular. This research paper aims at proposing a methodology for evaluating housing programs in Egypt, focusing on low-income housing programs prioritized by the state. This methodology is designed in stages based on studying global applications in evaluating low-income housing programs and concluding the most important steps and tools used in this regard, as well as the appropriate evaluation approach for each case; economic, social, environmental or technological to reach a theoretical methodology for evaluating housing programs that are appropriate to the Egyptian case. Then this methodology is reviewed and checked by experts and specialists, as well as by a group of administrative authorities in the State concerned with the application of housing programs in Egypt, through interviews therewith to consult them and ask for their views on the preliminary methodology in order to take them into account in the creation of the final methodology.

Keywords Housing Programs, Evaluation Methodologies, Low-Income Housing

1. Introduction

The research addresses low-income housing as one of the most essential issues in Egypt. The Housing sector topic has affected all Egyptian society categories, becoming an obstacle in the path of achieving the desired development. The housing problem in Egypt is the result of many consecutive economic, social and political conditions that Egypt experienced in the twentieth century [1]. The problem of housing in Egypt is not only about the provision of housing units, but also about the dimensions and other variables that affect the housing problem.

The State has therefore given it considerable attention in the form of a series of housing policies, programs and projects that attempt to resolve this issue.

The policies are general approaches and outlines of the State in dealing with the housing sector. The programs are a series of projects linked to each other to achieve common benefits. The project is the implementation of a specific number of activities that achieve the objectives of the programs and policies of implementing a number of specific housing units with certain specifications.

The country has built these policies and programs to deal with low-income housing issues since 1990 in order to find radical solutions to these issues [2]. Despite the efforts of the State and the private sector to solve this problem, there are many obstacles.

Some research projects have previously addressed housing issues in Egypt, especially for low-income groups, which represent a large proportion of the population in Egypt, some of which tackled the numerical problem of state housing units for low-income housing, as well as the price of housing units and the affordability of the targeted

groups for paying for those units. Some others tackled the role of the private sector in contributing to solving housing issues and evaluating the policies and strategies of the housing sector. Some other research projects addressed housing programs and evaluation in general without setting a methodology or a framework for the evaluation of low-income housing programs in Egypt.

The research problem lies in introducing policies and programs by the State without considering the evaluation of previous programs or identifying their strengths and weaknesses. This research seeks to develop a methodology for evaluating housing programs in Egypt, especially for low-income group, and to continuously evaluate them during implementation stages.

The research assumes that there is no clear approach or specific mechanism for evaluating housing programs in Egypt, especially for low-income group. This assumption was tested by presenting the current situation of the housing sector and identifying the problems of low-income housing and the State's attempts to overcome these problems by proposing multiple housing programs, but without considering the evaluation of those programs to recognize their advantages and disadvantages and the possibility of development and correcting their course during implementation. Based on that assumption, the result of the research is to propose a methodology for evaluating Egypt's low-income housing programs.

2. Objectives

The main aim of the research is to propose a methodology for evaluating low-income housing programs, specially the Egyptian case and to discuss the impact of the housing programs for the low-income group in achieving sustainable and resilience programs as a lack of evaluation framework for the previous programs to identify their strengths and weaknesses.

This is achieved through some of the following objectives:

- Analysis of global housing programs, methodologies and mechanisms of evaluation.
- Identification of global evaluation approaches and tools and their possible implementation in the Egyptian case.

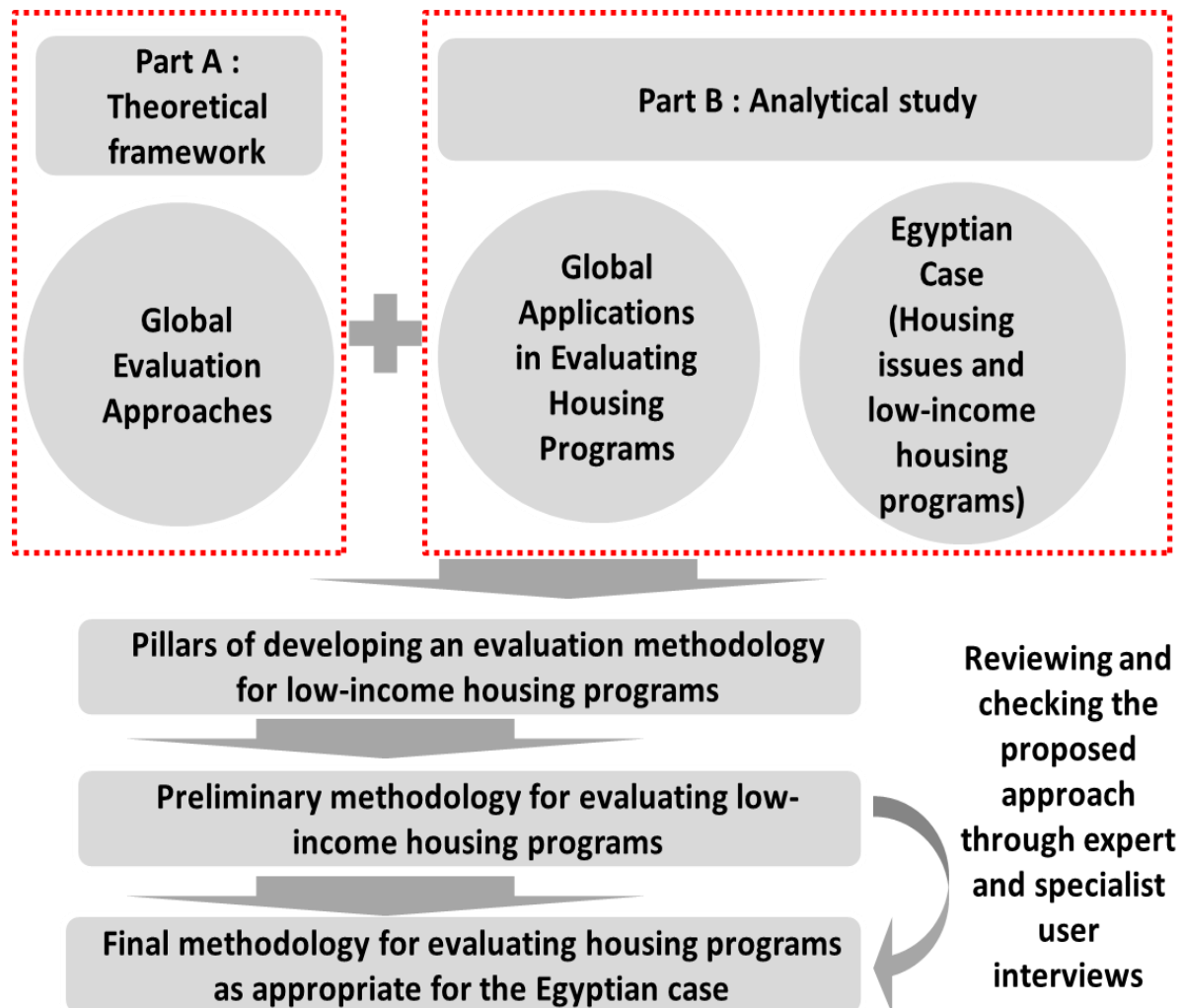
- Understanding low-income housing programs in Egypt.
- Concluding foundations for setting a general framework for developing a methodology for evaluating housing programs.

3. Methodology

The methodology used in this research is based on theoretical thinking through a review of global evaluation approaches and requirements using the inductive reasoning to localize global evaluation approaches to formulate a framework for evaluation that includes main stages, the tools used at each stage and the principles to be taken into account during the evaluation process.

Then an analytical study is presented using the comparative analysis approach for global and Arab applications in evaluating housing programs for low-income groups and learning the most important lessons, in terms of housing issues and the methods of addressing their housing programs and the methods and approaches of evaluating them and their evaluation tools. Then an analytical study of the current condition will be conducted to present the issues of Egypt's housing sector, particularly the low-income housing, and also introduce the housing plans and programs in Egypt's new cities and their evaluation in general and the strengths and weaknesses of each program by focusing on the social housing program.

From the conclusions of the two main parts of the research, the theoretical framework (approaches and methods of evaluation) and analytical study (global applications in the evaluation of low-income housing - the Egyptian case), a preliminary methodology is developed to evaluate housing programs in Egypt. It will be reviewed and checked by experts and specialists in the field, as well as by a group of administrative authorities in the State concerned with the application and implementation of housing programs in Egypt, through meetings therewith to consult them and ask for their views on the preliminary methodology in order to accommodate the proposed methodology to the Egyptian case to be taken into account in the development of the final methodology which is the main objective of the research. (Figure 1) indicates the methodology and stages of the research.



Source: Researcher.

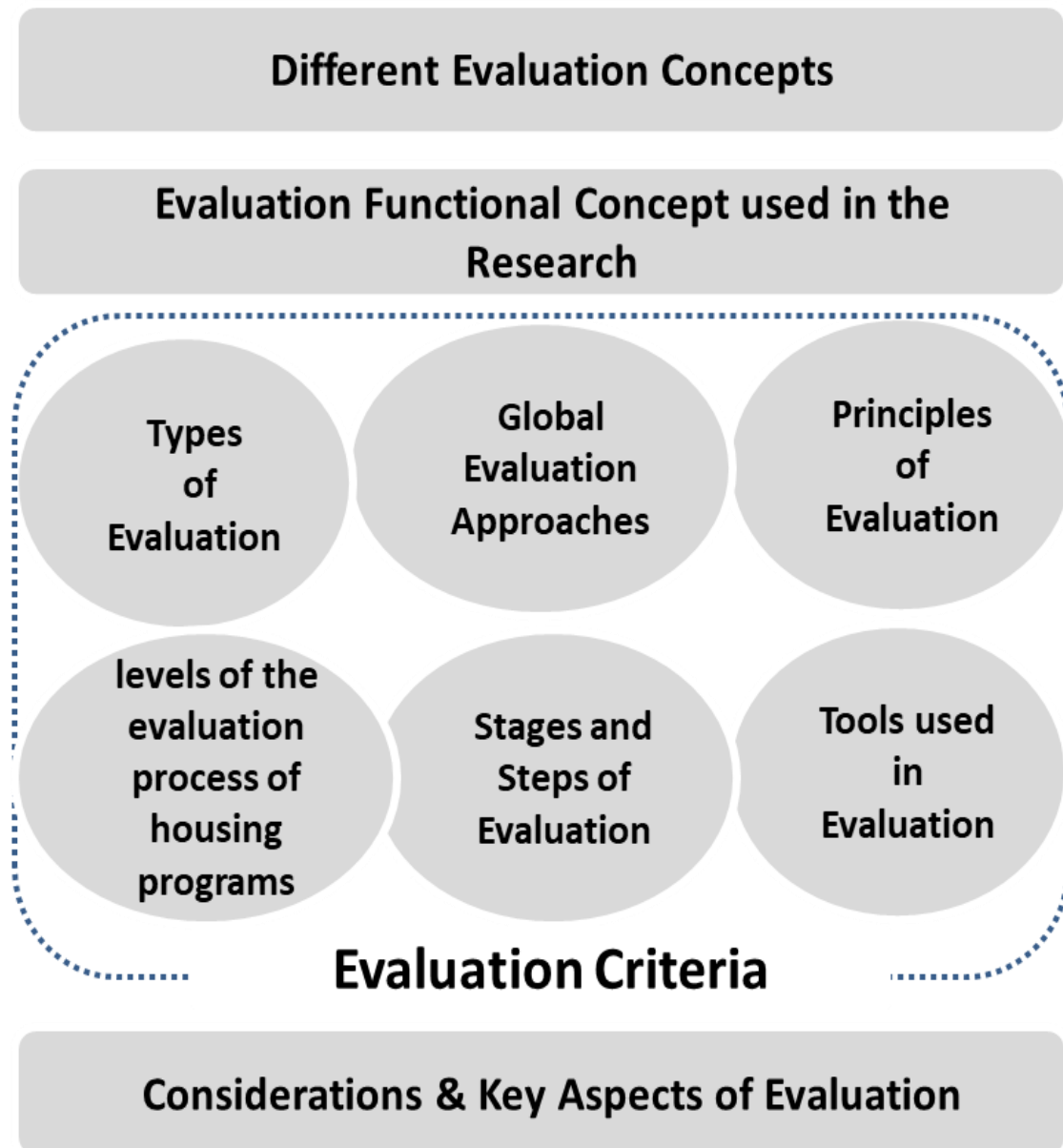
Figure 1. The methodology and stages of the research

Part A: Theoretical framework

3.1. Fundamental Frameworks of the Evaluation Process

This part addresses the main considerations of the evaluation process by presenting the concepts from both a methodological and a practical view, where different types, levels and stages of evaluation are considered. In addition, different approaches will be presented at local and

international levels, based on economic, social, environmental and other aspects. All the principles that require consideration during the assessment will be presented, with all modern evaluation tools and methods of application during the process in order to reach a comprehensive framework for all the aspects and variables of evaluation to be applied later on the Egyptian housing case. (Figure 2) indicates the aspects addressed in the theoretical framework of evaluation.

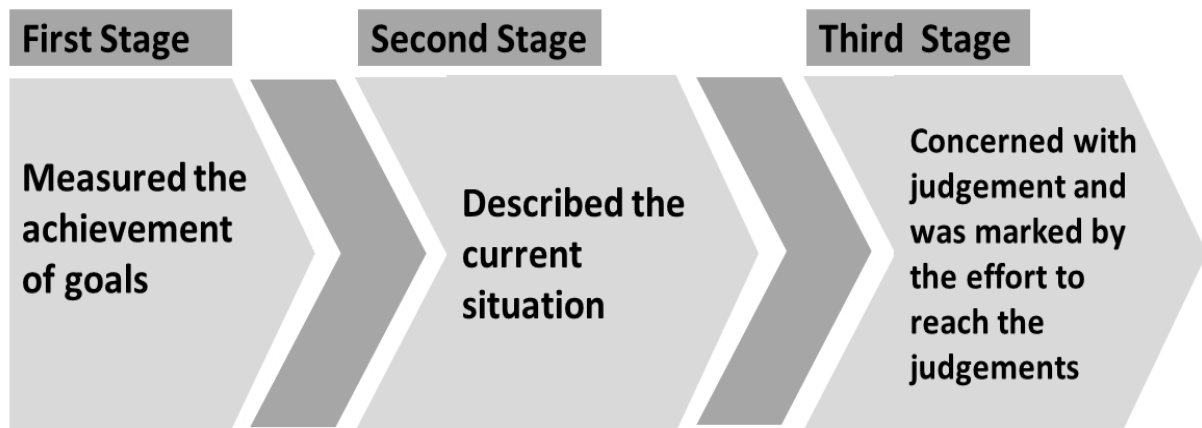


Source. Researcher

Figure 2. Considerations and key aspects of evaluation process

The evaluation process has been developed in the past few years, and there are recent attempts to provide a clear definition. The stages of historical development of the evaluation process have been conducted in 3 stages: First Stage: (was concerned with measurement of goals, and the role of the evaluator in the first generation was technical, by studying whether the aspect or the issue subject of evaluation can be measured by the appropriate tools or not).

Stage Two (was descriptive; it described the current situation and achievements of projects or programs). Stage Three (was concerned with judgements and was marked by the effort to reach the judgements through which the evaluation was made, while preserving the previous technical and descriptive functions. (Figure 3) indicates the stages of historical development of the evaluation process [3].



Source. Researcher based on [3].

Figure 3. The stages of historical development of the evaluation process

3.1.1. The concept of evaluation

This is a phased and structured process through which the information generated by the follow-up process is used to analyze the whole process and is done throughout the phases of planning by data collection and analysis to determine the extent to which programs and projects achieve their objectives and in the context of the implementation of the development strategy as the evaluation process is used to assess the efficiency and effectiveness of tasks and activities and to measure the results and impact of projects or programs on society [Researcher based on 4,5].

3.1.2. Importance and advantages of the evaluation process

The importance of evaluation lies in understanding and measuring the extent to which the objectives of projects and programs have been achieved and the reasons for succeeding in or failing at achieving them. The importance of evaluation increases because it measures the degree of achievement and its relationship to the objectives of the program, project or plan [6]. The process looks up for quality and quantity in different fields, helping to reach the standards and performance levels required for the achievement of the required rates of development. It also helps in accepting or rejecting new or innovative methods or techniques. Therefore, developed countries and specialized bodies have established special evaluation units with qualified and trained technical competencies. The most important reasons for the evaluation are [7]:

- Improving effectiveness.
- Recognizing the achievements of the project.
- The extent to which the objectives of the program have progressed.
- Identifying strengths and weaknesses.
- Effectiveness of efforts.
- Studying returns and costs

3.1.3. Types of evaluation

Evaluation is categorized based on the time of

completion of the evaluation process, and depends on the implementation of the program (pre-implementation evaluation, midterm evaluation, post-evaluation). The following is a brief description of the types of evaluation.

Pre-implementation Evaluation

Evaluation in this type is carried out before the implementation of the program or the project and is intended to assess whether the plan is accurate with respect to needs, objectives and the ways of implementation. It may identify potential difficulties as well as the needs of the target group of the program. Pre-evaluation is defined as an interactive process that provides judgement and recommendations in advance [8].

Midterm Evaluation

The midterm evaluation aims to ascertain the progress of the implementation, takes place at the midpoint of the implementation of the program and is concerned with initial outputs and results, which allow for an assessment of the quality of the project or program. The results of this assessment contribute to some adjustments during implementation [8]. The mid-term evaluation takes into account the following issues:

- Providing final data concluded from previous evaluation processes for the inputs being evaluated.
- Testing existing factors affecting the implementation process and efficiency in achieving the main objectives.
- Emphasis on setting the objectives accurately.
- Evaluating whether the indicators are relevant to the project and whether their modifications are necessary.
- Ensuring that the required quality standards are met (technical, financial and administrative)

Post-Evaluation

The evaluation aims to assess the program and the plan as a whole in the light of its contribution to the achievement of the objectives, and should be carried out no

later than three years after the end of the implementation period. It aims to study the long-term impacts and results and achieves sustainability of program or project [6], through the use of KPI (Key Performance Indicators) and OKR (Objectives Performance Results) tools [9].

3.1.4. Stages and steps of the evaluation process

The evaluation process consists of several phases based on proper preparation to define its objectives, scope, and evaluation-based methodology, as mentioned below:

A. Evaluation Planning

At this stage, demands and initial scope of assessment are analyzed, taking into account the time available and the financial situation of decision makers. The liaison officer and project manager draft terms of reference for the evaluation of the project. The terms of reference draft will be shared with the evaluation coordination authority and evaluation unit to ensure the quality and the final responsibilities and authorities [3].

B. Evaluation Design

At this stage, expectations are determined from the evaluation study, and objectives are set precisely. The purpose of the evaluation design is to provide an overview for factors that determine the extent to which the program has achieved its objectives [10].

C. Data collection and analysis

At this stage, data are collected, analyzed and taken in different ways as appropriate to the case study such as the following elements [11]:

- Meetings with end-users
- Surveys
- Observation
- Workshops

D. Preparation of reports and monitoring potential impacts

At this stage, the findings of the evaluation are presented in a form of a report and presented for discussion and consultation [12].

E. Using evaluation results

The information provided in the evaluation report helps in taking decisions. A plan is set within a time schedule to solve the problems of projects or programs [6].

F. Control and correction

The primary objective of the control process is to correct errors and deviations. Simply detecting them is not the goal unless it is accompanied by corrective steps as planned. Correction also means removing the causes and factors by which the deviation resulted [12].

3.1.5. Levels of the evaluation process

There are different levels for the evaluation of different planning elements. Monitoring and evaluation can be applied on the following different levels [13]:

- Project: (Focuses on a range of short-term activities).
- Program: (Includes a group of long-term activities) or (a set of projects).
- Sector: (Considers the long-term impact in the sector)
- Region: (Considers the impacts of interventions and policies at the national level and compares the regional level of performance with the national level)
- National: (Considers the long-term impacts of all development programs)
- International: (Considers the impacts of interventions and policies at the international level to identify trends and patterns of development worldwide.)

The second level of evaluation is therefore concerned with program evaluation (housing programs), selected and determined through the spatial and temporal scope as well as the objectives of the evaluation process.

3.1.6. Key principles of evaluation

This part presents the principles to be observed in the evaluation process which will be used and reflected on the Egyptian case in the formulation of the procedures and mechanisms to be implemented during the process, as well as the evaluation indicators and criteria, which will be clarified in the preparation of the proposed framework for the evaluation of housing programs in Egypt.

A. Validity of the methodology

The Research must be conducted in accordance with clear rules, in particular those relating to data collection and the inference and analysis methods adopted. Evaluation aims to examine the quality of projects and programs, as well as their improvement through the provision of information that helps to improve their effectiveness and efficiency. Evaluation identifies the strengths and weaknesses of projects. Evaluation project shall include the following [13]:

- Description of the subject of evaluation.
- Drafting evaluation questions.
- Determining evaluation criteria.
- Selecting research method and sample

B. Neutrality

Neutrality is to be objective, impartial, professional and honest. Evaluation shall be conducted in an impartial manner at all stages until the conclusions and recommendations are formulated [14].

C. Independence

The independence of the evaluation function is determined by organizational/functional and behavioral independence. Organizational and functional independence requires that the central evaluation function

be developed independently of the planning and management functions [15].

D. Credibility

Credibility is achieved by engaging neutral and unbiased technical and cultural professional evaluators, and by using appropriate methods and sources in data collection and analysis. Credibility requires transparent evaluation processes, participation of stakeholders, and a strong system for quality assurance [14].

E. Quality

All evaluations must meet minimum standards of quality. All evaluation reports must be submitted in a complete and organized manner, detailing evidence-based findings, conclusions, lessons learned and recommendations [14].

F. Benefits

The benefits of evaluation are demonstrated by its use in making relevant and timely contributions to organizational learning and decision-making processes [13].

G. Ethical conduct

Personal and professional integrity of evaluators and

respect for the confidentiality of sources must be maintained. The evaluation must be conducted with the highest standards of integrity. Residents must respect the rights of institutions and individuals to provide information with confidence [13].

H. Transparency

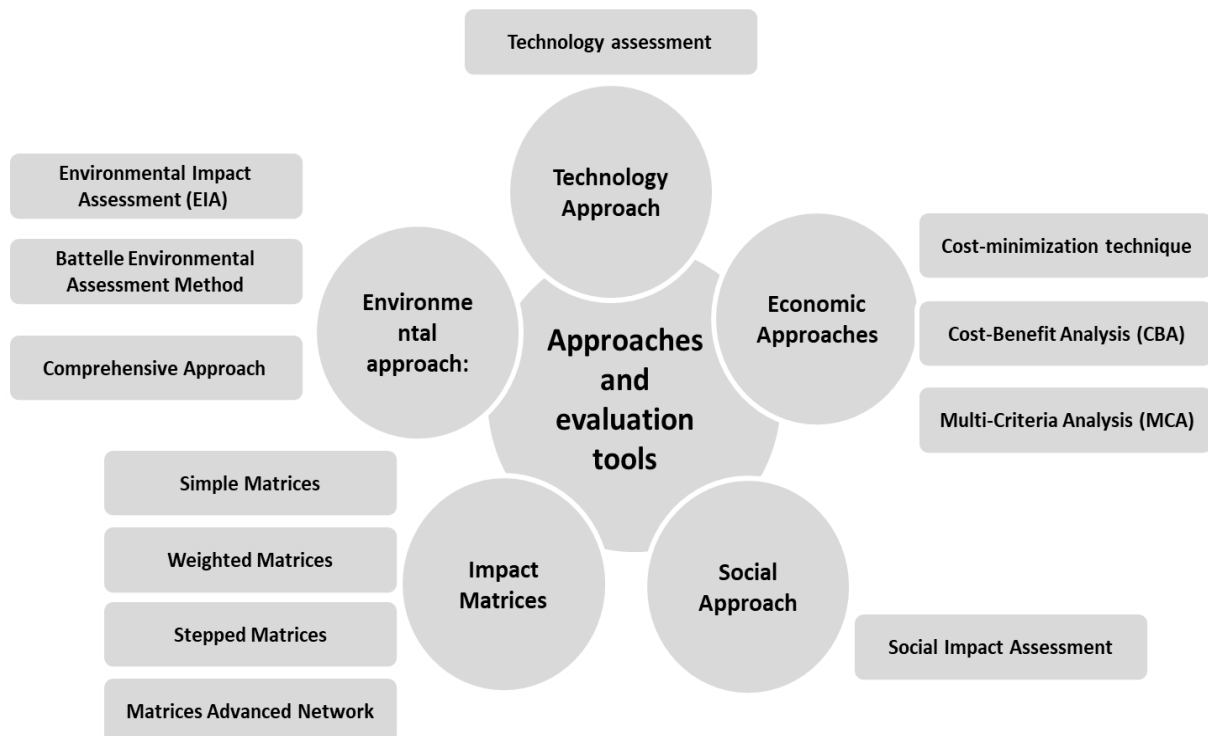
Transparency is guaranteed by consulting the key stakeholders at all the stages of evaluation. Terms of reference shall be available to key stakeholders and reports shall be circulated [13].

3.1.7. Approaches and evaluation tools

Approaches of evaluation of programs vary and can be classified into different approaches based on economic, social and other priorities according to different inputs and outputs of projects and programs.

The evaluation tools aim to identify how to apply the appropriate approach in the evaluation process which highlights the evaluation steps and procedures followed according to the used approach.

(Figure 4) indicates the approaches and evaluation tools. (Table 1) indicates the procedures and mechanisms for applying evaluation approaches.



Source. Researcher

Figure 4. The approaches and evaluation tools

Table 1. The procedures and mechanisms for applying evaluation approaches

Approaches of evaluation	Evaluation tools	Procedures/Mechanisms
Economic Approaches	Cost-minimization technique	This method is used for comparing program alternatives when project and programs outputs (benefits) cannot be measured. It is therefore assumed that benefits exceed the cost in these alternatives, and an emphasis shall be on reducing the cost to obtain them during cost minimization analysis [16].
	Cost-Benefit Analysis (CBA)	CBA method is associated with the valuation of the financial values of all returns and costs expected from a policy, plan or project and the evaluation of the final net profits over a certain period of time. Cost-benefit analysis aims at translating all the impacts to a financial value in order to help decision makers translate environmental and social costs in one measurement unit - money used to make decisions [17].
	Multi-Criteria Analysis (MCA)	Multi-Criteria analyses are conducted after the collection of different data and registering them in one index to be used in founding a rational basis for the classification of options and the common logical basis for such reasons, which helps in building a wide framework for the evaluation of the selection process impact, and simplification of the decision. Multi-Criteria decision methods have been classified to the following[18]: <ul style="list-style-type: none"> • Ordinal methods • Weighting methods • Multi – attribute utility based methods Weights and evaluation grades are set for the purpose of organizing and evaluating the alternatives.
Social Approach	Social Impact Assessment	The social impact assessment process sheds the light on the role of projects and programs in changing the culture of local communities. The steps for social impact assessment are[19]: <ul style="list-style-type: none"> • Public Participation: Development and implementation of an active participation plan of the public and stakeholders. • Defining alternatives: Definition of the proposed project and logical alternatives. • Conditions for studying the base plan: Documentation of the proposed project impact on the cohesiveness of human environment/space and current social conditions and trends. • Studying of the scope: Define and prioritize the scope of similar social impacts through multiple methods, including discussions and interviews with a number of those who are actually affected. • Assessment of potential impacts: Analysis and prediction of potential impacts of the project and its alternatives within the framework of the objectives of the plan. • Prediction and assessment of reactions to the impacts: Determining the importance of social impacts of those affected • Evaluation of indirect and cumulative effects: Identification of post-proposed project impacts including Grade 2 and Grade 3 impacts. • Changes in the alternatives: Recommendations of new alternatives or estimation of the consequences for those affected or stakeholders. • Mitigation: Development and implementation of mitigation plan to avoid, reduce and compensate for negative impacts. • Observation: Development and implementation of an observation program to recognize the deviations from the proposed project and any unforeseen effects.
Technology Approach	Technology assessment:	Technology assessment is a type of systematic method used for studying a policy, plan or program for testing its impact on the surrounding society upon implementing a certain technology approach or expanding or modifying the use of a particular technology. The Methodological steps of technology evaluation can be defined in the following [20]: <ul style="list-style-type: none"> • Identification of the problem: Nature and area of study. • Description of the used technology: Identification and definition of the main technological variables and possible alternatives. • Prediction of expected technologies: It means predicting the characteristics and strength of changes in technologies. • Social description: It means descriptions (quantitative and qualitative) of different social aspects that interact directly or indirectly with the technology used. • Social expectations: It means predicting the social changes and their relationship to the technology used. • Identifying impacts: The types and forms of impacts that will result from the interaction between the technology used and the social environment. • Evaluation of impacts: It is concerned with linking impact assessment to the society that is affected while comparing alternatives to technology applications and dealing with desirable and undesirable consequences of its use.

Table 1. Continued

Environmental approach:	Environmental Impact Assessment (EIA)	<p>The steps for environmental assessment EIA are [21,22,23]:</p> <ul style="list-style-type: none"> • Introduction to the proposed project or program: This is the first step and the beginning of environmental assessment where the project, required to be environmentally evaluated, is defined with alternatives to avoid adverse impacts of the program. • Project screening: At that stage, it will be determined whether or not an environmental impact assessment is required for the project through positive and negative lists such as the impact on environmentally sensitive areas or the degree of environmental pollution. • Setting the maximum limit for the development project: Maximum limits of production or production-specific rates are determined, and if the permitted rates exceed the permitted limits, the environmental impact is assessed. • Sensitive sites: The spatial ranges are classified according to the degree of environmental sensitivity and then an environmental assessment of any project is carried out in highly sensitive locations. • Conducting a comprehensive environmental assessment: This phase is an essential result of the previous phase, as a comprehensive environmental assessment is to be determined according to the classification of the project and the degree of its environmental impact. • Evaluation of impacts: It is an important stage of EIA environmental assessment and is often divided into several steps (collecting reference data, identifying impacts, predicting changes, determining the significance of impacts, preparing a statement of environmental impacts). • Review: Through this phase, the quality of the environmental impact report is reviewed in accordance with specific criteria and it shall be confirmed that the environmental report includes all key issues of environmental impact assessment. • Decision-making process: At this stage, the decision on the proposed project is taken, while considering the results of the environmental impact assessment and the decision can take multiple forms. • Monitoring and control: Control plays an important role in the Environmental Impact Assessment process until: - (establishing a baseline for environmental conditions and trends - identifying seasonal changes).
	Comprehensive Approach (The environmental Assessment at the strategic level):	<p>Environmental assessment has been developed lately as a tool to integrate environmental interests in an orderly manner. The method of environmental assessment at the strategic level is one of the new dimensions of various methods of environmental evaluation, as it is supported by sustainable development considerations, cumulative environmental impacts as well as environmental assessment considerations for projects. Therefore, it is a comprehensive method that[24]:</p> <ul style="list-style-type: none"> • Facilitates and integrates sustainability in decision making process as well as making development policies and plans. • Considers cumulative and long- term impacts in the stages of policy, plan and program development.
Impact Matrices	<p>A more complex model, which can be used in quantitative terms, resembles lists that are used in tabular form to present information and uses matrices to quantify impacts by applying some numeric values to the size and importance of different project activities. Matrices can be used to assess the impacts of project activities on resources. It is divided into types[25]:</p> <ul style="list-style-type: none"> • Simple Matrices • Weighted Matrices • Stepped Matrices • Matrices Advanced Network 	

Source. Researcher based on [17,18,19,20,21,22,23,24,25].

3.1.8. The tools used in the evaluation process

There are two types of information or data to answer evaluation questions.

Quantitative and qualitative data: it is required to understand the different nature of each type of data because it affects the methods of data collection and analysis in the evaluation study.

The evaluation process requires the classification, composition, and organization of data in pre-analysis files, whether electronic or paper, while providing some

guidance for the preparation of data files:

- Dedicate one file for each type of data according to the type of assessment tool because each tool has its own connotations.
- Record the data on a device.
- Use data analysis software because quantitative data requires specific programs; Excel or SPSS (Statistical Package for the Social Science).
- Monitor the results of the preparation and processing of data in a manner appropriate to facilitate the

extraction of findings and indicators and classify them according to evaluation tools.

- Review the files and verify that all the data are processed and included.
- Data accuracy check: Once data files are obtained and processed, they must be reviewed to verify their accuracy before starting.

The tools used in the evaluation process are (Survey, Focus group, Activity log, Documentation, Meetings, Evaluation Form, One-site visit, Notes, Recorded conversations and stories).

After reviewing the evaluation fundamental frames, starting by the definitions and terminology, and then the levels and concepts of evaluations, and evaluation tools of projects and programs, various evaluation approaches have been concluded, which were previously presented in the last part; namely the economic, social, environmental, and technology approaches, as well as impact matrices. It is concluded that there is no direct theoretical approach to evaluating housing programs, especially the low-income groups. Therefore, the second part of the research in the following will present some global applications through which housing programs have been evaluated in different forms. The research is based on concluding the method and evaluation methodology of evaluating each experience and

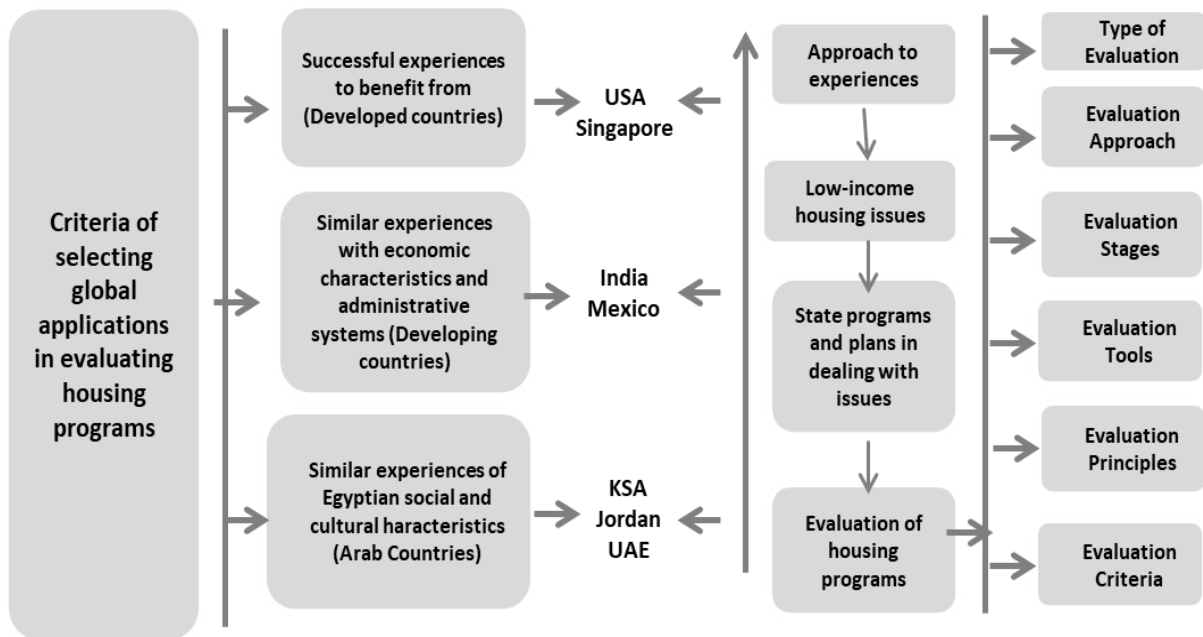
reflecting them on the study piers of the research.

Part B: Analytical study

3.2. Global Applications in Evaluating Housing Programs

This part addresses global applications in assessing low-income housing programs, with an objective to reach a successful scientific framework that can guide the evaluation process by reaching the stages, tools and methods of assessment and identifying the approaches used.

The research considered selecting applications in various housing problems for low-income category, as well as various housing evaluation approaches and the mechanisms for pursuing housing programs, in addition to the diversity of the spatial and geographical scope and the similarity of these applications to the Egyptian case either in terms of the administrative systems of these countries or similarity in cultural, social and economic characteristics. (Figure 5) indicates the methodology and steps of addressing global applications. (Table 2) indicates the problems of low-income housing in global applications and methods of dealing with them.



Source. Researcher.

Figure 5. Methodology and steps of addressing global applications in evaluating housing programs

Table 2. The problems of low-income housing in global applications and methods of dealing with them

applications	Low-income housing problems:	Methods of dealing with the Low-income housing problems:
USA case study	<p>Although the United States of America is one of the greatest countries, it suffers from some problems in the housing sector[26]:</p> <ul style="list-style-type: none"> • Neighborhood Decay – especially old neighborhoods, and the migration of their residents and replacing them by a much lower level of population. • Poor distribution of housing between different states as a result of migration. • Problems related to the ability to pay for housing (Affordability), whether in terms of renting the unit to individuals, homeless people who stay in streets or in metro stations. 	<ul style="list-style-type: none"> ● Supporting product or production: It is achieved through the reduction of factor prices - economically, which includes land, labor, capital and the entrepreneurship required for the production process [27]. ● Supporting the beneficiary: The beneficiary's support is achieved by increasing his or her ability to purchase a housing unit or suitable housing, so the beneficiary's support may include[28]: <ul style="list-style-type: none"> • Housing support or grant. • Social grant. • Providing governmental housing • Reducing housing • Tax cut ● Mandatory Inclusionary Housing Program: The Inclusionary Housing Program provides houses for lower- income households. A neighborhood (land lot) is being re-zoned to accommodate the increase in the demand on housing. The program started in January 2019 as five neighborhoods were re-zoned, starting from east of New York having the higher density; 75% of the total area was allocated for units with market price and the remaining 25% were dedicated for low-income households [29]. ● Vacant Cluster program: There are many vacant housing clusters with hundreds of housing units. The New Settlement Apartments is one of the projects, sponsored by the Settlement Housing Fund, one of the largest nonprofit organizations whose mission is to create and sustain high quality affordable low-income housing in New York. 30% of the units are dedicated to homeless households, and they cover their rents, 40% are dedicated for low-income households, 20% for moderate income households, and 10% for households to pay at the market price[30].
Singapore case study	<p>The importance of the Singapore experience lies in their creativity in finding solutions to comprehensive development. In some regions, population density reached 8000 people/km², making it the world's most densely populated country</p>	<p>The government has developed plans and programs to address the problem and improve and support the housing sector, establishing Singapore Housing and Development Board. Their mission was to provide high quality affordable housing. Through public housing (affordable) programs, the Board has expanded their work by managing real-estate and accommodations, by providing for them commercial, industrial, recreational, religious and social facilities. The State has also standardized housing construction through the board to be highly efficient in planning and making the best use of the available resources, thus reflecting the quality of housing units built, through the adopted saving system and providing installment payments that are affordable for households. The Government has made it possible for citizens to choose whether to rent or buy their own units, and the prices of these units have been set at less than the construction cost after the cost of the land was completely excluded from the housing unit price[31].</p>
India case study	<p>India has experienced a rapid population growth that has led to major problems in the housing sector, including [32]:</p> <ul style="list-style-type: none"> • Unregulated Market • Spread of slums and squatter areas around the railroad. • Contraction on the demand curve due to high prices • Decline in the number of newly constructed units by 45%. 	<p>To address these problems, financial institutions have been established specifically for the purpose of housing finance, including Housing and Urban Development Corporation (HUDCO), National Housing Bank (NHB), and National Buildings Organization (NBO) [33].</p> <ul style="list-style-type: none"> • Institutional Finance for Housing: Many financial institutions have been established by the government in order to provide housing finance such as cooperative house building societies to provide housing funding, Housing and Urban Development Corporation (HUDCO) providing housing loans to government housing boards, municipal corporations and development authorities, and The Housing Development Finance Corporation (HDFC) established in the private sector to provide housing finance [34]. • Village Housing Scheme: Rural areas represent more than 76% where the majority of families are deprived of housing facilities. The Village Housing Scheme has been proposed to assist in building and improving houses in rural areas. The scheme also aims to allocate home sites to agricultural workers without a home [35].

Table 2 Continued

Mexico case study	The average annual population growth rate in Mexico is about 2.1%, with 50% of Mexico's residential areas being slum areas, more than 60% of dwellings were built by people, and by housing programs adopted by the State [36].	Displacement and Resettlement: Housing units were built near the old center, having an area of 30 m ² :45 m ² having one or two floors. The units were designed with a narrow street façade, with the possibility of commercial activities in the ground floor. The Government also provided support to each family during the new housing construction period, supporting each family with a relocation allowance [37]. El Arenal Apartments for Newly Married Couples: This project aimed to accommodate 100,000 newly married couples using cheap building materials. The residents decided to gradually improve their housing units in cooperation with the government [38].
Jordan case study	The housing problem in Jordan, as in other developing countries, is caused by the lack of adequate housing for a low-income class, where there is a gap between the supply of certain type of housing units and the demand for such units[39].	An updated strategy for the housing sector has been developed through which problems and imbalances are accurately identified and solutions are found, where the Government is responsible for developing and implementing actions and measures to enable low-income families obtain a minimum level of appropriate housing [39]. A number of real-estate development finance organizations have been established to work on saving and lending for housing and banking services. A number of savings funds have been established to finance housing, such as the Social Security Fund, the Teachers' Housing Fund, university funds and others, as well as to increase the supply of affordable housing and the quality of rented housing [39].
Saudi case study	One of the most important problems in the housing development process in KSA is the increase in the price of housing. The National Real Estate Commission of the Saudi Chamber of Commerce and Industry referred to another problem affecting the Kingdom's housing sector, namely, high housing prices and limited supply of land in relation to its demand.	The Kingdom has a vital role to play in the provision of affordable housing, ranging from full or partial financing of projects from the State budget to facilitating access to finance through affordable bank loans for eligible citizens. The Kingdom may also distribute lands in their possession to individuals as grants or at symbolic value to build thereon after providing all required facilities and services. The strategy of the future Vision for Housing in the comprehensive development plan includes two main objectives, the first is to provide housing for every homeless family and the second is to increase the ownership of citizens. This vision is achieved through the following elements[40]: <ul style="list-style-type: none">• Improving the management and regulating the supply of residential lands, as well as providing public facilities and services and controlling land granting system.• Reviewing the building codes and specifications to help in reducing the cost and increase the supply of lands and housings.• Expansion in and providing support for charitable housing projects.• Increased availability of private sector funding and providing guaranteed options and support system.• Active participation of non-profit organizations in reaching low-income groups.• Developing medium-density communities with comprehensive lifestyle approach (work, residence, retail, leisure and education). The program succeeded in the development and improvement of regulatory and legislative activities through the establishment of the Real Estate General Authority as the central regulator of the real estate sector. The program has also launched the lease documentation service "Lease Platform" to regulate the real estate rental sector in Saudi Arabia because of its importance in safeguarding the rights of contracting parties[40].
UAE case study	The main problems in the housing sector in the United Arab Emirates is the high prices of land and housing units and the lack of affordable housing units. Therefore, the Government has implemented various housing programs, which have been translated into housing projects in all the emirates, the most important of which are:	Government housing: The government is building small communities to meet urgent needs, with houses known as Traditional Houses. The construction of government housing has undergone vast development and improvements; the unit consists of four bedrooms, a living room, a sitting area and other facilities. The design of the housing considered the need to reflect the cultural characteristic and standard of living while considering future expansion [41]. Support Program: Supplying new facilities to community housing in old cities by adding other utility rooms. When old cities became more crowded, municipalities planned new areas on modern grounds, to grant families lands in these areas[42]. Sheikh Zayed Housing Program: A law was passed for establishing the Sheikh Zayed Housing Program with the purpose of improving the living conditions of citizens, in commitment to the continuation of comprehensive social welfare, which was an important added value to the State's efforts in housing and urban planning[43].

Source. Researcher based on [27:43].

● **Fundamental frameworks from global applications in evaluating low-income housing programs**

In addition to the topics addressed in the previous part of the low-income housing sector challenges in each of the global applications and housing programs to address those challenges, global applications have been studied and analyzed in order to identify each approach to low-income housing issues, evaluation method and types, evaluation steps and stages, and tools used for each stage to conclude the governing frameworks in the evaluation process, the assessment criteria and measurement indicators to be reflected on the Egyptian situation.

The following are the conclusions and results of the study, which are an important part in the formulation of the proposed approach to the evaluation of housing programs in Egypt.

I. Types of Evaluation

By studying and analyzing the global applications used in the research, it is noted that the experience of the United States of America uses the pre-evaluation type. However, Singapore and Saudi Arabia use the mid-term evaluation, but India, UAE and Mexico use the post-evaluation type. (Table 3) indicates the types of evaluation applied in the global applications.

II. Stages of Evaluation

The preliminary stages of evaluation are similar in most of the research applications in terms of planning, evaluation, data collection and analysis, and vary in the final stages in monitoring the level of people satisfaction and the tools used, as well as in the correction mechanisms. (Table 4) indicates the stages and steps of evaluation used in the global applications.

Table 3. The types of evaluation applied in the global applications.

Types of Evaluation	USA	Singapore	KSA	Jordan	UAE	Mexico	India
Pre-evaluation							
Mid-term evaluation							
Post-evaluation							

Table 4. The stages and steps of evaluation used in the global applications.

Stages of Evaluation	USA	Singapore	KSA	Jordan	UAE	Mexico	India
Evaluation Planning							
Identification of key characteristics of the scope of study sample							
Identification of data collection tools and methods							
Data Analysis							
Concluding evaluation results							
Monitoring the level of satisfaction of people							
Management and follow-up							
Corrective measures							

III. Approaches of Evaluation

Approaches vary according to the case, some Case study applications adopt a single approach for evaluation such as Saudi Arabia, Jordan and the Emirates, and other applications depend on more than one approach in the evaluation process, such as the United States of America and India. (Table 5) indicates the evaluation approaches used in the global experience.

IV. Tools of Evaluation

With the diversity of approaches, it is necessary to know the different assessment tools that help in collecting the

data required to be able to reach the answers. (Table 6) indicates the tools used in the evaluation of the global experience.

V. Criteria of Evaluation

All criteria for assessing the success of the program have been monitored in accordance with the achievement of its objectives, including economic, social, environmental and institutional standards, the most important of which are those associated with safety and privacy, affordability, as well as the participation of residents. (Table 7) indicates the evaluation criteria used in the global experience.

Table 5. The evaluation approaches used in the global experience

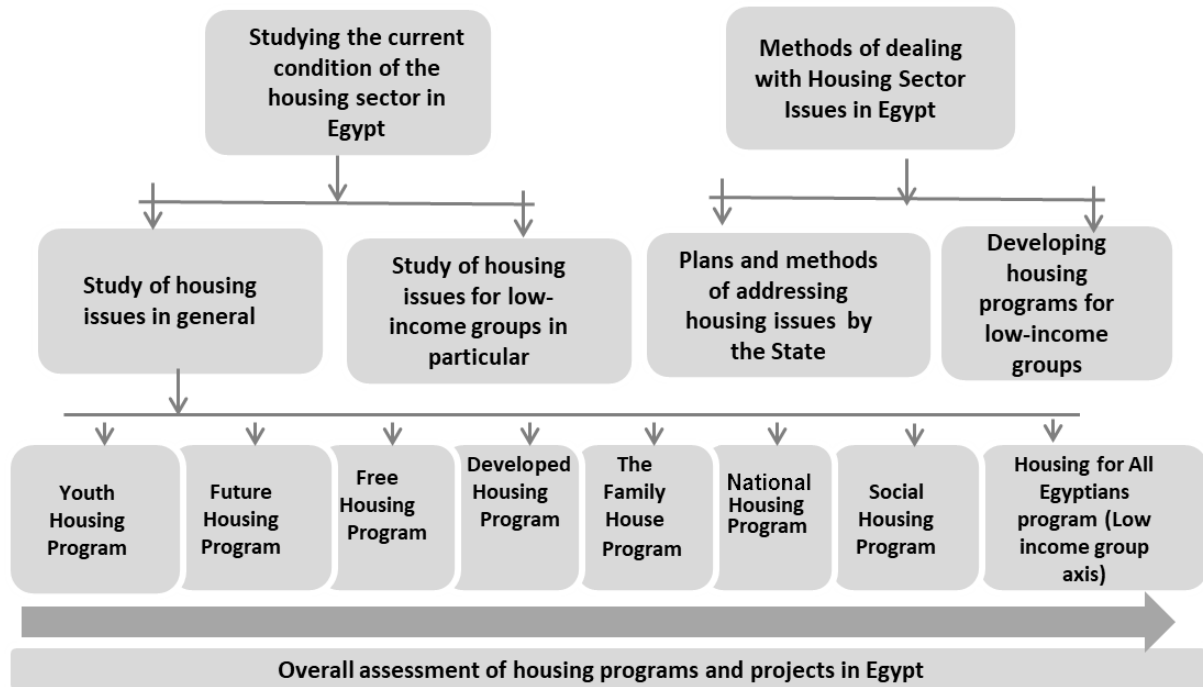
Approaches of Evaluation	USA	Singapore	KSA	Jordan	UAE	Mexico	India
Environmental approach							
Economic Approach							
Social Approach							
Technology Approach							
Impact Matrices							

Table 6. The tools used in the evaluation of the global experience

Tools of Evaluation	USA	Singapore	KSA	Jordan	UAE	Mexico	India
Survey							
Focus group							
Documentation							
Meetings							
Site visit							
Recorded conversations and stories							

Table 7. The evaluation criteria used in the global experience.

Criteria of Evaluation	USA	Singapore	KSA	Jordan	UAE	Mexico	India
The ability to have an appropriate housing							
Community participation							
Affordability							
Measuring the quality of life and standard of living							
Family ties and caring for the elderly							
Provision of basic services and facilities							
Ensuring that the project can be fully funded at different stages							
Flexibility in the quality and level of housing units							
proximity to the workplace							



Source. Researcher

Figure 6. The aspects of the Egyptian case study

3.3. Egyptian Case Study

The housing Issue is one of the most important issues facing development in Egypt. Despite the efforts covering the needs of urban areas by providing facilities and main services, the high rate of population growth and increased rural-urban migration, and the focus of public funding available to support the construction of new housing units have made it difficult to cope with the increase in populations and their requirements for basic services and facilities in urban areas. (Figure 6) indicates the aspects of the Egyptian case study.

3.3.1. Housing problem in Egypt

The housing problem in Egypt was intensified at the beginning of the sixties with the issuance of several laws to reduce housing rents for the benefit of poor groups. This led to the reluctance of the private sector to invest in low-income housing rental units during this period. Therefore, the State had to bear the burden of providing housing for poor society groups. The main reasons of this problem can be summed up as follows:

Economic Reasons:

Low investment in the housing sector in general and in medium- to low-income housing in particular; the increasing migration rates from rural areas to cities which increased demand on housing; in addition to the relative high cost of building housing units as compared to the ability of citizens, especially medium- and low-income groups to afford their prices[44].

Social Reasons [44]:

- The rise in domestic migration from rural to urban areas.
- Increase of population growth rates.
- It is difficult to cope with population growth and its requirements for services and facilities in urban areas.
- Influx of informal housing because of poverty and migration.
- Continuous decrease in the area of land available for construction.
- Unequal access to affordable appropriate housing for low- and medium-income housing.
- Large number of closed and unutilized housing units.

Legislative Reasons:

The housing problem emerged as a result of the absence of legislation necessary to regulate the housing process or the weak and inadequate existing ones. This has resulted in the emergence of slums, informal housing and housing constructed outside the permitted space or constructed against law. In addition, legislations have been enacted from a political perspective, which hindered the general construction of the medium-income housing [45].

3.3.2. Challenges of Egypt's housing sector, particularly the low-income group:

The challenges of Egypt's low-income housing sector can be summarized in the following [44]:

- The relatively high cost of housing units, which cannot be afforded by medium- and low-income

citizens as a result of private sector controlling the units.

- The demand for luxurious and above-average housing is attractive to the public sector to implement some housing projects, which has increased the imbalance between different levels of housing.
- The private sector has declined to provide low-income housing for several reasons: -
- The owners' desire for a quick profit.
- Increasing bank interest rates.
- The owners don't finish the apartment buildings.

3.3.3. Development of the plans and programs that address low-income housing Issues

The State has worked to reduce the problems of the housing sector by making and implementing policies since the very beginning of this problem, and has prioritized the housing issue. However, this priority has been affected by political conditions such as war, as well as the direction of support towards economic development, such as the inclination towards support for major industries and economic openness, as was the case in the 1970s. That has not prevented State from paying attention to the housing sector since the 1950s till today through its role in reducing those problems and making investments directed to the implementation of housing policies and the extent to which these policies and programs meet the needs of population, especially low-income groups, for housing units [46].

The adopted housing programs have started by Youth Housing Program, Future Housing Program, Developer and the Future, National and Social Housing Programs, and finally a Housing for All Egyptians program. The following table includes a comparative study for low-income housing programs adopted in Egypt. (Table 8) indicates the evolution of the housing programs in Egypt for low-income group. [Researcher based on 1,2,39, 44, 46, 47]

3.3.4. Fundamental frameworks from the overall assessment of housing programs in Egypt

The overall assessment phase of housing programs and projects, and their roles in solving the housing problems in Egypt were based on an exploratory study (survey) of the views of the population living in areas of these programs, as well as officials working for the Ministry of Housing, and authorities concerned with tendering the programs that were carried out based on previous studies with an objective to conclude some of evaluation criteria and indicators that shall be provided to ensure the success of these programs which are a main aspect in developing the evaluation methodology that is the main target of the research. The most important results and indicators of the survey on the role of housing programs in dealing with the problem as a concept in general is that there was a general consent that the housing problem of low income group can be solved through the currently proposed housing projects in new cities because it is the best way to provide more housing units. So it is a quantitative solution to the problem, as well as State support for units and affordable payment methods [2]. The main shortcomings of housing programs, especially for the Social Housing Program to be the last planned program that is already inhabited, have been limited to the following, from the perspective of the population and the authorities concerned: high cost of units compared to the purchasing power of low-income groups, small areas of units or land plots, poor finishing, and no guarantee that the housing units go to their beneficiaries. Most of these shortcomings are also related to economic aspects, as well as to some legislative aspects, the inability to sell or rent the units, the failure to introduce all programs in all cities as well as poor accessibility and that there is one prototype for all the programs in new cities.

Table 8. The evolution of the housing programs in Egypt for low-income group

Criteria and variables	Youth Housing Program	Future Housing Program	Free Housing Program	Developed Housing Program	Family Housing Program	National Housing Program				National Housing Program	Social Housing Program
						The Family House (The Core Housing)	Buildings	Build your own house	Primary categories		
Main objective of programs	Achieving a real boom in housing for the middle and poor classes by providing affordable housing for low-income young people.		Providing housing units at their cost to be affordable for low-income households	Providing housing units for low-income young people and help them build appropriate housing for them at the beginning of their lives.	Providing plots of lands to meet citizens' needs for appropriate housing for them and their families to build according to their needs	Providing lands with subsidized price for the units implemented by investors to reduce the cost of the unit.	Providing appropriate housing for low-income youth			Providing a suitable urban environment for low-income group	Providing one million housing units having different areas to help improve the quality of life
Targeted groups	Low-income youth	Low-income youth	Low-income Group	Low-income Group	Medium-income Group	Low- and Medium-income Groups	Low-income Group	Low-income youth	below the poverty line	Low-income group	Low- and medium income groups
Housing pattern	apartment							lots	apartment	apartment and lots	apartment
Proposed pattern area Based on the housing pattern	100 m ² – 70 m ² – 63 m ²	63 m ²	63 m ² - 75 m ²	50 m ² - 57 m ²	250 m ² - 350 m ²	100 m ² Land plots	63 m ²	Land lot area = 150 m ²	36 m ²	70 m ² 90 m ² Lands 209 m ²	90 m ² - 120 m ²
Project time limit	1996- 2005	1998 - 2000	1990s –2006	1990s -2000	2000	2006	2005	2007	2007 – 2012	2014 - 2019	2019 -present
Financing authority	NUCA	Future Society - NUCA	NUCA - Investors	NUCA	Individuals	NUCA	NUCA - Investors	Individuals	NUCA		

Table 8 Continued

Payment plan	The young man/woman shall be entitled to 18,000: 31,000 EGP, including a subsidized cooperative loan of 15,000 EGP, to be paid in 40 years at 5% interest, and the monthly premium shall not exceed 73 EGP.	The young man/woman shall be entitled to 15,000: 27,000 EGP, including a subsidized cooperative loan of 15,000 EGP, to be paid in 40 years at 5% interest, and the monthly premium shall not exceed 70 EGP.	Paying an advance payment equal to 25% of the total price of the unit; 15,000 EGP to be paid in 40 years at 5% interest	The Unit has two loans, a 15,000 pound cooperative loan with interest of 5% for 40 years and a supplementary loan of 10,000 EGP for 44 years without interest.	Providing land plots for citizen with a 15,000 EGP grant that will not be paid back	The citizen pays 5,000 EGP as an advance payment for reserving the unit and then pays a monthly premium after receiving the unit of 160 EGP, which increases by 7.5% for 20 years.	The citizen pays 5,000 EGP as an advance payment for reserving the unit and then pays a monthly premium after receiving the unit of 160 EGP, which increases by 7.5% for 20 years.	Provision of housing units to citizens = The citizen pays 5,000 EGP as an advance payment for reserving the unit and then pays a monthly premium after receiving the unit of 160 EGP, which increases by 7.5% for 20 years.	The units are for rent	15,500 EGP are paid as an advance payment. 12 quarterly payments are made with a total of 2600 per each payment. provided that the monthly instalments are for a citizen whose income reaches 2500 EGP, he pays 967 EGP per month, for a period of 20 years the value of the bank's financing of the unit worth 220 thousand EGP.	The mortgage finance is at 3% interest for 30 years. The minimum income for eligible people is 3500 EGP for 100m2 unit, having a total price 471 Thousand EGP. The fixed monthly premium is 1390 EGP. In addition, 120m2 unit is also including with a price 563 thousand EGP, for minimum income for eligible people is 4200 EGP. The fixed monthly premium is 1662 EGP. The finance for this type is for 30 years.
State Support	One billion and a half in direct support. * State supports up to 40% total cost	The State grants 15,000 EGP non-refunded grant to every citizen entitled to the unit	The State grants 15,000 EGP non-refunded grant to every citizen entitled to the unit	The State grants 15,000 EGP non-refunded grant to every citizen entitled to the unit	* There is no material support from the State, but the individual pays an advance payment and pays the land remaining value in premiums.	The State grants 15,000 EGP non-refunded grant to every citizen entitled to the unit. Facilities are supported in all housing programs	The State provides the land to citizen with 15,000 EGP non-refunded grant to every citizen.	Totally supported by the State and the rent is very low		Land and facilities are supported	Land is supported

Source. Researcher based on [1,2,39, 44, 46, 47].

4. Results

In light of studying the theoretical framework of the evaluation process, as well as global applications in evaluating low-income housing programs and the Egyptian case study through the analysis of the overall evaluation of housing programs in Egypt, and how the programs contribute in addressing the low-income housing sector issues, a preliminary methodology has been developed to evaluate housing programs in Egypt through a number of pillars and axes starting from the identification of the evaluation followed and the steps and stages of assessment and the procedures and tools used at each stage, and the basic principles in the process by adhering to the evaluation criteria.

(Figure 7) indicates the method of concluding the elements of the general framework and the proposed approach from all the studies that were addressed in the research.

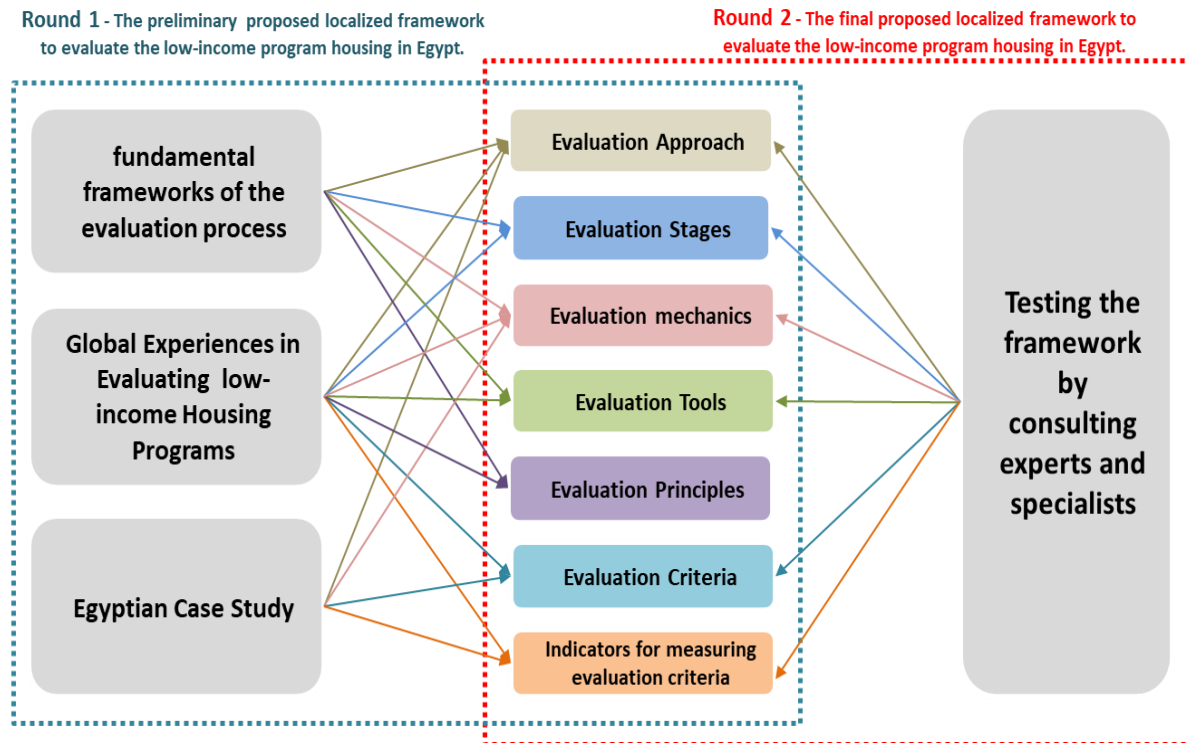
An evaluation methodology is proposed based on the integration between economic and social approaches, using evaluation tools of each approach, namely least-cost analysis, cost-benefit analysis as well as social impact assessment. The stages of the evaluation of programs that

fit the Egyptian case have also been identified (evaluation planning, evaluation design, determining evaluation criteria and program objectives, data collection and analysis, preparation of reports and monitoring potential impacts, using evaluation results, control and management and correction), the procedures followed at each of these stages and the tools and methods have also been defined.

Evaluation criteria have also been identified to ensure the success of the program, and to achieve sustainable and resilience housing programs, classified into 5 key criteria: Funding and cost, project planning and design processes, appropriateness of the proposed housing patterns, criteria of general satisfaction of population and criteria of management and follow-up mechanisms, in addition, the indicators that shall be achieved in each criterion have also been identified.

These criteria were set through the general framework for assessing housing programs in Egypt and the weaknesses of those programs presented in the Egyptian case study.

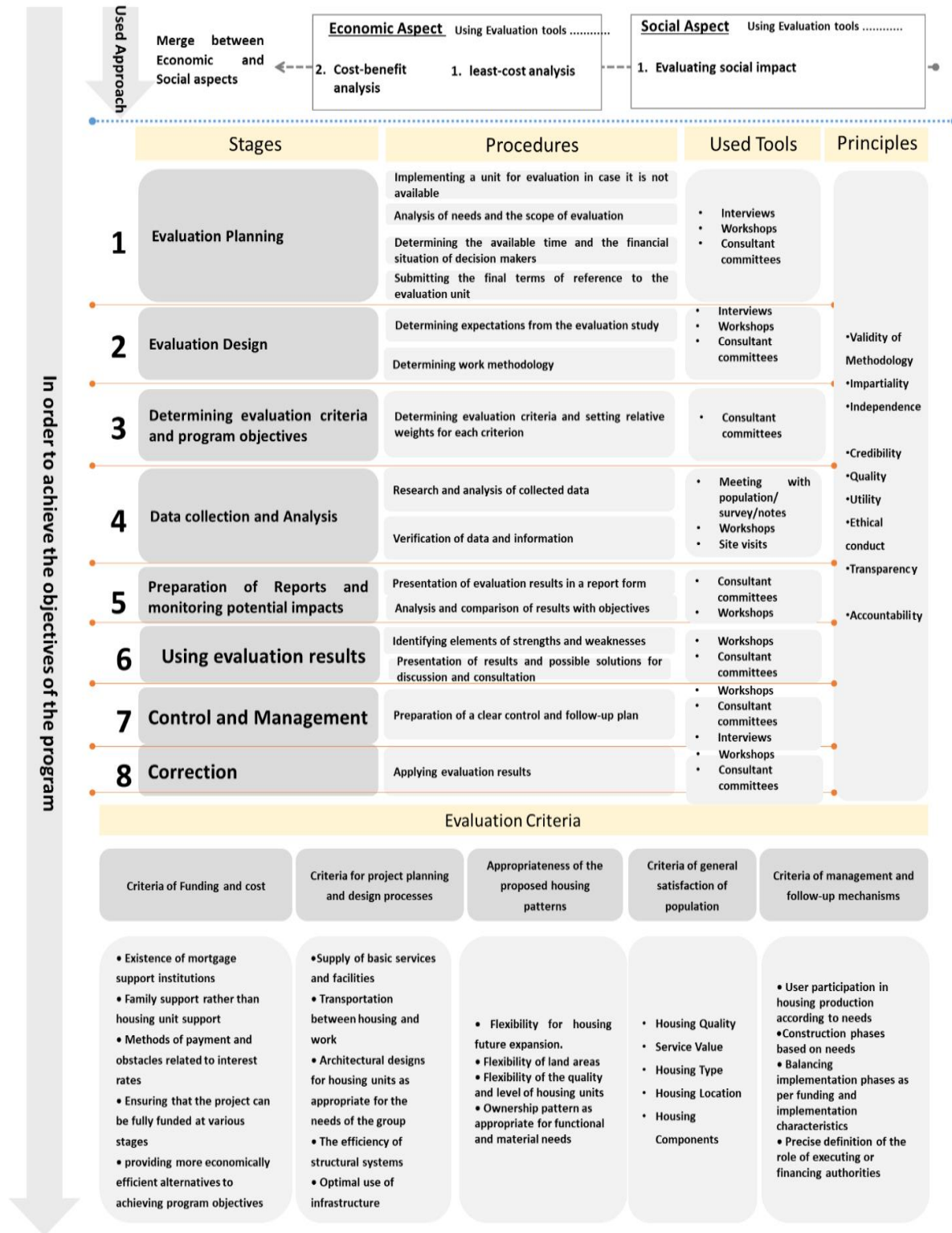
(Figure 8) indicates the preliminary proposed localized framework to evaluate the low-income program housing in Egypt.



Source. Researcher

Figure 7. The method of concluding the elements of the general framework

The Preliminary Methodology for the Evaluation of (Low-Income) Housing Programs suited to the Egyptian Case



Source. Researcher

Figure 8. The preliminary proposed localized framework to evaluate the low-income program housing in Egypt

The methodology has been proposed to evaluate low-income housing programs in Egypt to be applied to the Egyptian Case. In order for the methodology to be more

effective, it has been checked and reviewed by testing the preliminary methodology by consulting experts and specialists through meetings with members from different

authorities:

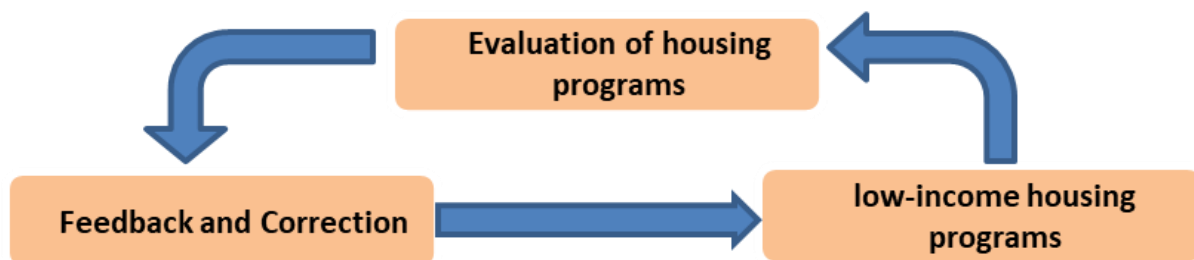
- Professors from the Faculty of Urban and Regional Planning – Cairo University
- Professors from the Faculty of Engineering – Department of Architecture and Planning - Cairo University.
- Leaders from the Ministry of Housing, Utilities and Urban Communities
- Leaders from the New Urban Communities Authority.
- Heads from the New City Development Agencies.

The most important recommendations and proposals for modifying and developing the preliminary methodology have come from a range of social, economic, legislative and institutional dimensions and pillars as follows:

- Regarding the assessment methodology used, the integrated socio-environmental economic approach was proposed where the environmental approach was added by including environmental impact assessment to the social impact assessment as well as cost-benefit analysis.
- As for evaluation phases, it has been proposed to add (define the overall objectives of the program) to the planning of the evaluation in the first phase and (detailed objectives of the program) to the third phase. In addition, the third and fourth phases have been

integrated in the preliminary methodology, to become monitoring potential impacts and preparing evaluation result reports. The correction stage has been replaced by the control and management so that the sixth stage has become the correction phase and the seventh has become control and management. So that the evaluation process is an ongoing process. Figure (9) indicates the cycle of the evaluation process.

- Regarding the tools and methods used at each stage, it was proposed to identify and detail how each tool would be used because each method of dealing with each tool would vary depending on the stage in which it is used. For example, consultant committees would differ in the evaluation planning phase from the management and control phase.
- The criteria of evaluation have been proposed in 6 groups to be integrated with program objectives. The criteria can be summed up as follows: Possession pattern criteria - urban planning criteria – design criteria of housing units – criteria of economic aspects - criteria of social aspects - criteria of institutional frameworks). Table (9) indicates the relative weights of the evaluation criteria and their measurement indicators.



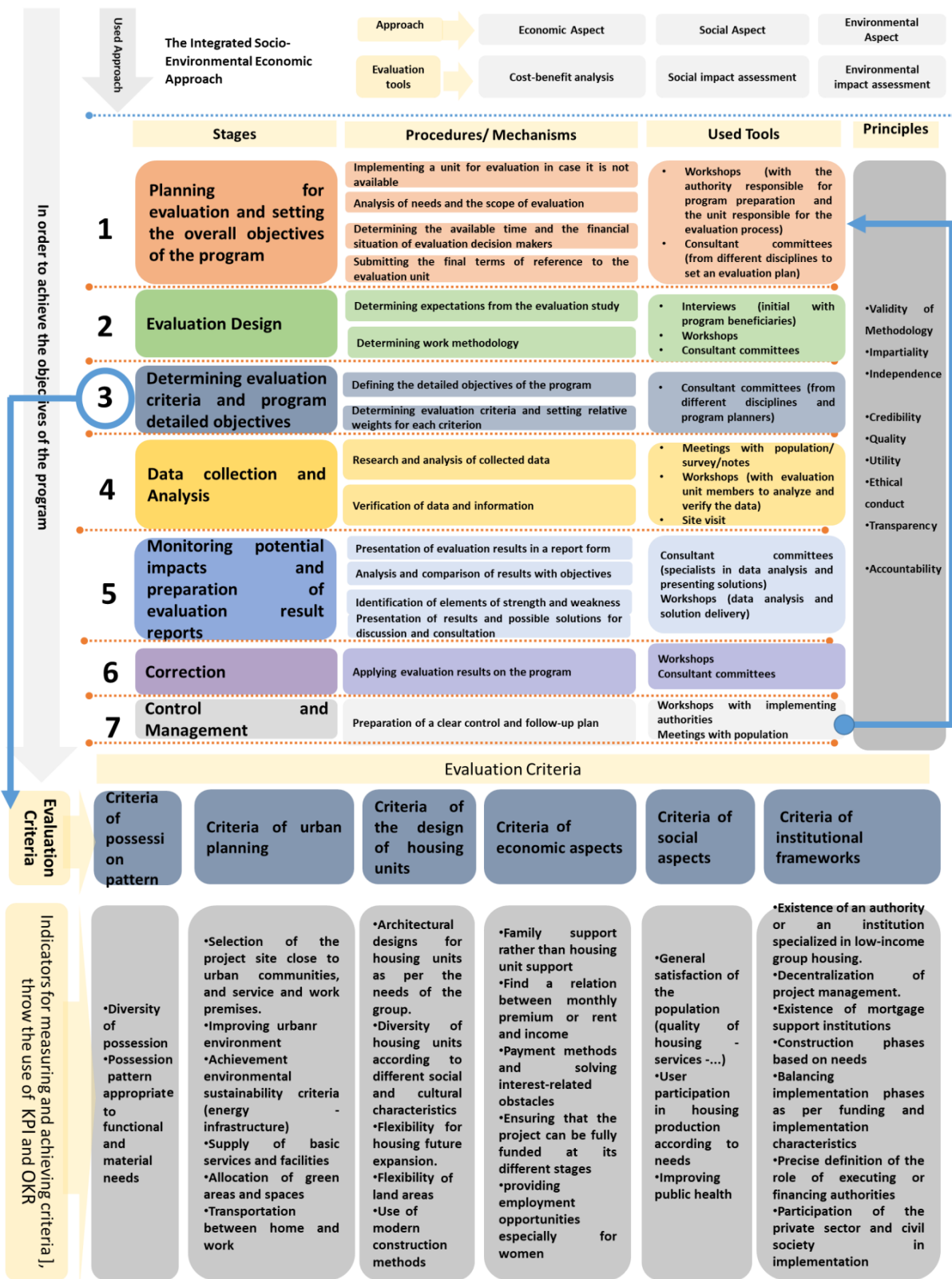
Source. Researcher

Figure 9. The cycle of the evaluation process

Table 9. The relative weights of the evaluation criteria and their measurement indicators

Evaluation Criteria	Indicators for measuring and achieving criteria	Round 1 - The preliminary proposed localized framework		Round 2 - The final proposed localized framework		relative weights of the evaluation criteria
		Global applications	Egyptian Case studies	consulting experts and specialists	Leaders from the Ministry of Housing and NUCA	
Criteria of possession pattern	Diversity of possession					2
	Possession pattern appropriate to functional and material needs					3
Criteria of urban planning	Selection of the project site close to urban communities, and service and work premises.					2
	Improving urban environment					2
	Achievement of environmental sustainability criteria (energy - infrastructure)					1
	Supply of basic services and facilities					2
	Allocation of green areas and spaces					2
	Transportation between home and work					1
Criteria of the design of housing units	Architectural designs for housing units as per the needs of the group.					1
	Diversity of housing units according to different social and cultural characteristics					3
	Flexibility for housing future expansion.					1
	Flexibility of land areas					1
	Use of modern construction methods					1
Criteria of economic aspects	Family support rather than housing unit support					2
	Find a relation between monthly premium or rent and income					1
	Payment methods and solving interest-related obstacles					2
	Ensuring that the project can be fully funded at its different stages					4
	providing employment opportunities especially for women					2
Criteria of social aspects	General satisfaction of the population (quality of housing - services -...)					2
	User participation in housing production according to needs					2
	Improving public health					1
Criteria of institutional frameworks	Existence of an authority or an institution specialized in low-income group housing.					2
	Decentralization of project management.					1
	Existence of mortgage support institutions					1
	Construction phases based on needs					3
	Balancing implementation phases as per funding and implementation characteristics					2
	Precise definition of the role of executing or financing authorities					1
	Participation of the private sector and civil society in implementation					2

Source. Researcher.



Source. Researcher

Figure 10. The Final proposed localized framework to evaluate the low-income program housing in Egypt

Figure (10) indicates the final proposed localized framework to evaluate the low-income program housing in Egypt.

5. Discussion

The research paper has set a methodology for evaluating the housing programs for low-income groups to suit the Egyptian case. However, in order to implement this methodology in reality, there must be supportive frameworks, the most important of which is the institutional framework as mechanisms are set for these frameworks by the authorities that work on implementing the program and executing the continuous evaluation process. The Ministry of Housing, Utilities & Urban Communities is the main authority responsible for the implementation, follow-up and continuous evaluation of the program. The most important mechanisms and procedures are:

- Establishing an institutional entity responsible for program development and continuous evaluation.
- Enhancing the efficiency of the Government's executive bodies responsible for the housing sector and providing human and financial resources.
- Empowering and encouraging government bodies to achieve housing policy goals and to make the best use of resources.
- Improving performance and coordinating with relevant authorities, simplifying procedures and providing facilities.
- Integration of legislative, political and institutional frameworks. The political frameworks seek to achieve the principles of social equity in housing and translate them to policies. The legislative frameworks seek to translate the policy approach to legislative policies and legal frameworks. The institutional framework also seeks to achieve the goals of sustainable social development through the implementation of low-income housing programs and projects.

The research also concluded the criteria for evaluating housing programs in Egypt, which are measured and achieved through some of the indicators for each criterion that must be achieved to ensure the success of the program. However, the philosophy and implementation of evaluation criteria vary based on housing levels as well as the region. Also, criteria vary according to social, economic and cultural characteristics from community to another and have a direct impact on evaluation criteria. Therefore, an analytical and explanatory study of the philosophy of evaluation criteria shall therefore be prepared to be possibly implemented in the Egyptian case.

The research has addressed the currently applied financing systems for low-income housing projects, and the need to ensure that the project can be fully financed at different stages, but a detailed study for the efficiency of the financing system for low-income housing projects is needed to make housing affordable for individuals and must include all elements of housing production.

Selection of the locations of low-income housing

projects has been explicitly noted in the research in the criteria of program evaluation, in the planning criteria which shall be discussed in more detail with an objective to setting criteria and principles for selecting the sites of low-income housing projects.

6. Conclusion

The research has addressed the evolution of the evaluation methodology, which has witnessed significant evolution recently. Global evaluation approaches have been studied as well as the possibility to apply them on the Egyptian case and all the requirements of evaluation process supporting the success of evaluation, in addition to studying global applications in the evaluation of low-income housing programs and concluding the lessons learned that may be reflected and applied on the Egyptian case by preparing a methodology for the evaluation of low-income housing programs in Egypt. The methodology has been verified and checked by consulting experts, specialists and leaders of the State's bodies to include their opinions and proposals in the final methodology.

The main pillars of the proposed methodology are the evaluation approach, stages and steps of evaluation, procedures, tools, principles of evaluation process, and criteria of evaluation.

The Integrated Socio-Environmental Economic approach was proposed and used through research, as the evaluation tools of these approaches have been merged to reach this approach. The merged tools are cost-benefit analysis, environmental impact assessment and social impact assessment, which were achieved through the procedures and mechanisms, as well as the types and elements of evaluation criteria and indicators of their measurements, which are applied in the proposed methodology in the research.

Seven main evaluation stages have been identified, namely; evaluation planning, determining general objectives of the program, evaluation design, determining evaluation criteria and program detailed objectives, collection and analysis of collected data, preparation of reports and monitoring potential impacts, correction and changing of inappropriate approaches, and monitoring and management.

The evaluation criteria have been divided into six groups including possession pattern criteria, urban planning criteria, design criteria of housing units, criteria of economic aspects, criteria of social aspects, and criteria of institutional frameworks. These criteria have been integrated with the objectives of the program and indicators have been set to measure the extent to which the criteria have achieved their objectives.

Finally, the research has concluded a comprehensive methodology for the evaluation of low-income housing programs in Egypt that considers modern innovations in

the evaluation fields as well as the economic, social and environmental dimensions that take into account the Egyptian case. The approach has also focused on the mechanisms of its implementation through a proposal for institutional and legislative frameworks that would maintain the sustainability of implementation.

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