



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكرو فيلم

بسم الله الرحمن الرحيم



HANAA ALY



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم



شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



HANAA ALY



Ain Shams University
Faculty of Engineering
Department of Architecture
Post Graduation

Methodology of Sustainable Building Materials for Economic Housing in Egypt through Smart Applications

A Thesis Presented to Faculty of Engineering at Ain Shams University
Submitted in Partial Fulfillment of the Requirements for the Degree of
Doctoral of Philosophy
in Architectural Engineering Department

Presented by:

Bishoy Magdy Tawfeeq Sidhom

Bachelor of Science Degree in Architecture Department, Faculty of Engineering,
October 6 University, July 2012

And Master of Science Degree in Architecture Department, Faculty of Engineering,
Ain Shams University, May 2018

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November 2021



Ain Shams University
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Department of Architecture
Post Graduation

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Ain Shams University
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Approval of Grants

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Statement

This thesis is submitted as a partial fulfillment to Faculty of Engineering, Ain Shams University for the Ph.D. degree in Architecture Department.

The work included in this thesis was carried out by the researcher at the Department of Architecture, Faculty of Engineering, Ain Shams University, and During the Period from September 2019 to November 2021.

No Part of this thesis has been submitted for a degree of a qualification at any other university or institute.

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Bishoy Magdy Tawfeeq Sidhom

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Dedication

*To my grandmother, father, mother and my brothers
whom they are kind heart to me.*

*To my all my family and friends whom encouraged me
so much.*

To my country Egypt to have a rising and bright future.

Abstract

Buildings are considered the national valuable assets need to preserve and maintain, because of their functional, civilizational or historical value. The buildings are suffering from design problems, such as; architectural drawings and taking decisions that take many durations of time or implementation and maintenance by the implementation of the structure of buildings and finishes ... etc. Public buildings are not without the use of energy and resources to operate them and adapt them to the needs of their users. The close link between environment and development has led to the emergence of a concept of development called sustainable development to increase better opportunities for people in a society without a shortage to meet their basic needs for a long period of time to achieve prosperity and happiness for society, that leading role of aware architects the importance application of energy conservation systems and rational consumption and the use of renewable energy alternative to preserve the environment and reduce pollution resulting from the use of traditional systems of power generation. Sustainable housing development has become an important issue that needs to be taken into the subject to provide adequate housing for families, but they are still inadequate for the needs of users. The importance of the subject is to find suitable solutions to provide adequate housing for low-income families through the availability of appropriate construction methods and materials that achieve the appropriate cost, quality and sustainability as well.

The problem is the failure to take advantage of local materials that help to reduce costs, time and the completion of the implementation period and also is the lack of computer programs in the Ministry of Housing, government bodies and special housing agencies that help designers to make the right decisions in choosing the right materials in each region that adapt climatic conditions and adapted to nature. The research aims to identify the housing projects in Global, Egypt and the extent to which the criteria of sustainability are met or not available. Consequently, the focus of the study is not only to look at these projects in problems but to focus on developing future visions and how to implement sustainability, especially the idea of sustainable construction of the construction industry as well as on individuals and construction processes.

The research also aims to reach appropriate construction methods for sustainability to measure the application of methods, determine the degree of sustainability and how to apply technology, organize management and environmental conservation through the work of designing a computer program for sustainable materials for appropriate solutions in buildings in Egypt.

This thesis presents the study and analysis of economic housing projects in Egypt and the evaluation of the elements of sustainability achieved, the use of local building materials and how to apply them to achieve the sustainability of those projects and the requirements of users. The research finds that the lack of use and utilization of local materials leads to high costs of housing units and the emergence of problems in them that need to be maintained periodically because of the inability of those materials to weather conditions. This thesis also presents design a computer program by name **(Sustainable Materials in Economic Housing)** that considered as the introduction of local and sustainable materials to guide designers and companies to select the appropriate materials from the results and graphs that are appropriate in each region to reduce costs and achieve sustainable development.

**Key Words: Strategy - Sustainable Building – Environmental Performance
Efficiency - Purchasing power - Construction Industry - Local Materials -
Economic Housing - Computer Program**

Table of Contents

Approval of Grants	I
Statement.....	II
Researcher Information	III
Acknowledgement	IV
Dedication	V
Abstract	VI
Table of Contents	VIII
List of Figures	XXV
List of Tables.....	XXXII
List of Abbreviations.....	XXXVI
Research Summary	XXXVIII

Chapter One: Introduction of Research

Introduction	1
Scientific Addition in Research.....	3
Literature Review	4
Brief Introduction to the Scientific Field.....	10
Field of Research.....	10
Research Problem.....	10
Research Objective.....	12
Research Hypothesis	12
Research Methodology.....	13
Research Structure	14

Chapter Two: Housing in Egypt, Strategies and problems

Introduction.....	17
2-1-Housing Problems	17
2-2-General Definitions	18
2-2-1-Types of residential buildings	20
2-2-2-Types and degree of connection of the housing units to each other	20
2-3-Housing Strategy	22
2-3-1-Role of strategy	22
2-3-2-Objectives of the Strategy	22
2-3-3-Strategic strengths.....	23
2-3-4-Strategic weaknesses.....	24
2-3-5-How to improve Strategy	25
2-3-6-Types of Sustainable Housing Strategies.....	28
2-3-6-1-UN Habitat Housing Global Strategies	28
2-3-6-2- The Sustainable Development Strategy (SDS): EGYPT VISION 2030	34
2-4-Relationship between low income housing problem and income source	36
2-5-Conditions for the availability of adequate housing	41
2-6-General indicator of urban deprivation	42
2-6-1-Deprivation problem	42
2-6-1-1-Regional indicators for people living in the most disadvantaged areas of Egypt.....	43

2-6-1-2-Urban deprived Reasons	44
2-6-1-3-Quantification of deprivation	45
2-6-1-4-Methodology of calculating deprivation in Egypt.....	47
2-6-2-Affordability of housing	48
2-6-2-1-Problem of affordability of housing	48
2-6-2-2-People who can not afford housing in Egypt.....	49
2-6-2-3-Reasons for counting the ability to afford citizens housing costs.....	50
2-6-2-4- Proposals	50
2-6-2-5-Methodology of affordability	51
2-6-3-Housing overcrowding	53
2-6-3-1-Problem of overcrowding	53
2-6-3-2-People living in crowded conditions in Egypt	54
2-6-3-3-Overcrowded conditions and reasons	55
2-6-3-4- Proposals.....	56
2-6-3-5-Methodology of Overcrowded: Definition of Overcrowded.....	56
2-6-3-6-Extreme overcrowding	58
2-6-3-7-Method of calculation of overcrowding in Egypt	59
2-6-3-8-Specific concerns: overcrowding and health	60
2-6-4-Safety Housing	60
2-6-4-1-A problem in the weakness of the residential capacity	61