بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

MONA MAGHRABY

THE ROLE OF SUSTAINABILITY IN MITIGATING CARBON EMISSIONS IN CITIES AND ADAPTING TO CLIMATE CHANGE: A STUDY OF ASSESSMENT TOOLS

By

Hanan Ahmed Mahmoud Ahmed

A Thesis Submitted to the
Faculty of Engineering at Cairo University
In Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
In
Architectural Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Title of Thesis:
The Role of Sustainability in Mitigating Carbon Emissions in Cities and Adapting to Climate Change: A Study of Assessment Tools.

Key Words:
Climate change; GHG and Carbon emissions; cities and buildings; CO_2 assessment tools in cities and buildings; sustainable development Goals and Green Economy.

Summary:

Climate change (CC) is one of the most serious challenges facing the world in general and cities in particular, with consequences that go far beyond CC impacts on the environment and cities. Thus, it is a persistent challenge that requires collective global coordinating efforts to help countries shifting towards a low-carbon economy. The research deals with studying climate change and carbon emissions and their causes, and the mitigation and adaptation strategies, through examining two main elements – are the biggest causes of greenhouse gas emissions, mainly carbon (cities and buildings). The research aims at studying the criteria and tools for measuring carbon emissions for cities and buildings in order to find out the best and appropriate criterion for designing low-carbon cities and near zero-energy buildings based on carbon emissions calculations. The research depends on two approaches: the theoretical and analytical approach. The theoretical approach relies on data collection and processing on carbon emissions in cities and their different sectors, as well as that from buildings and their consumption of energy during their life cycle. The analytical method depends on the comparative analysis of some criteria, tools and different measurements' methods for emissions in cities and buildings. The research also reviews SDGs and the green economy as a tool to achieve SD. The research reviews the main findings through a proposal for a framework for dealing with climate change issues, based on the results reached during the research. This proposal is considered a guideline that explains the dimensions of the problem, its causes, and solution methods in a simplified manner through six elements. Finally, the thesis presents the results and conclusions as well as the recommendations to the concerned entities and authorities.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

Name: Hanan Ahmed Mahmoud Ahmed Date: / /2021

Signature:

Dedication

I dedicate my thesis to my family and friends.

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First of all, no word can be expressed to Allah for His gifts. I would like to express my sincere gratitude to my second country, Egypt, for welcoming foreign students and providing all means of care, attention and knowledge in safety, comfort and ease, and for giving me the opportunity to be a student at Cairo University. This a great edifice and a beacon of science and knowledge. Furthermore, I would like to thank my supervisor Prof. Dr. Mohsen Aboulnaga for the directives, recommendations and strong support during the research and study starting from the stage of the thesis title to what the thesis has reached now. On this day, I extend my sincere thanks to my distinguished professors in the examiners committee, for their kind approval for discussing this thesis, the external examiner (Prof. Dr. Morad Abdelkader Abdelmohsen) and the internal examiner (Prof. Dr. Ayman H. Ahmed). I thank everyone who studied me or contributed to my teaching from the doctors of Cairo University and all professors who, after God Almighty, give me the credit for teaching me the science of environmental design and planning. I am also grateful to the management of the Faculty of Engineering, Cairo University, and all its member employees for the directions and facilitation for the expatriate students the required services and assistance in various ways in all matters that would make them in a comfortable place for study and knowledge seeking in a system. Finally, I cannot forget to thank my family and friends for all the support.

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