Department of Architecture
Faculty of Engineering
Ain Shams University

SUSTAINABLE LANDSCAPE IN UNIVERSITY CAMPUS URBAN DESIGN

By

Ahmed Ibrahim Amr

B.Sc. Architecture, Ain Shams University, 2010

A thesis Submitted to the Faculty of Engineering in Partial Fulfillment of requirements for the degree of

Master of Science in Architecture

Supervised by

Prof.
Shaimaa Kamel
Professor of Architecture
Department of Architecture
Faculty of Engineering
Ain Shams University

Prof.
Germin El Gohary
Professor of Landscape
Department of
Urban Design and Planning
Faculty of Engineering
Ain Shams University

Prof.
Johannes Hamhaber
Professor of Urban and Regional
Management
ITT
Cologne University of Applied
Sciences

Ain Shams University
CAIRO, EGYPT
2015

STATEMENT

This thesis is submitted to Ain Shams University for the degree of Master in Architecture. The work included in this thesis was accomplished by the author at the Department of Architecture, Faculty of Engineering; Ain shams University.

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

Date: / /2015

Signature:

Name: Ahmed Ibrahim Amr

Faculty: Faculty of Engineering – Ain Shams University

BOARD OF EXAMINERS

Examiner	Signature
Prof. Ayman Hassaan Mahmoud Professor of Landscape Faculty of Engineering Cairo University	
A. Prof. Ahmed Atef Faggal Associate Professor of Architecture Faculty of Engineering Ain Shams University	
Prof. Shaimaa Mohamed Kamel Professor of Architecture Faculty of Engineering Ain Shams University	
Prof. Germin Farouk El Gohary Professor of Landscape Faculty of Engineering Ain Shams University	

ACKNOWLEDGEMENTS

First of all, I would like to thank God for his generosity, blessings and giving me power, health and patience to finish this piece of work. May He always guide me to help my country and widen my knowledge to serve humanity and Islam.

Second, this thesis is a tiny thank you to my mother Iman El Soufy, father Ibrahim Amr and brother Tarek Amr who always support me and are my backbone in everything. Nothing could be enough to show my respect, gratitude and endless love.

My deepest appreciation and thanks to my dearest supervisors. Words aren't enough to thank you for your great support and limitless help.

Thank you to Prof. Shaimaa Kamel, Prof. Gemin El Gohary and Prof. Johannes Hamhaber

Special thanks to my dear and supportive friends who always helped and really cared: Arch. Reem Fahmy, Dr. Marwa Abd El Latif, Arch. Merham Kelg.

I sincerely appreciate the help of Prof. Ahmed Sherif, Prof. Laila El Marsy, Prof. Maher Stino, Dr. Ahmed Amin, Prof. Tamer El Khorazaty, Prof. Hanan Sabry, Dr. Ahmed Rashed, Dr. Gehan Nagy, Dr. Samah El Khateeb, Eng. Tawheid (AUC), Eng. Aly (BUE), Arch. Mohamed Abeedo, Arch. Manar Mohamed, Arch. Mariam Ahmed and Arch. Sameh Ibrahim.

Thank you to my dear doctors who have great input in my knowledge and intellectual exposure Dr. Marwa Khalifa and Prof. Mohamed Salheen.

UPD staff, you are my second family that I am honored to be part of.

All members of ITT, Fachochschule Köln, I am so grateful for your company and support during my stay in Köln, Germany.

My friends and family, you are one of the pillars of my life. Thank you to: Mohamed Mamdouh, Ahmed Hany, Abdallah Salah, Abdallah Raouf, Akram Sherif, Moatasem Ziad, Mohamed Reda, Hatem Ahmed, Amira Nabil, Samar El Moatasem, Alaa Ehab, Sara El Ansary, Omneya El Mogy, Sara Abd El Baki, Mohamed Zayed and Simon Witti. To my dear uncle, and my favorite writer Mohamed Amr, thank you for the final review of the thesis.

ABSTRACT

This thesis aims to reach a set of comprehensive guidelines and checklist for sustainable landscape measures in university campuses. The study managed to examine the state of campus landscape in some of the contemporary universities in Egypt and check the application of sustainability regarding campus landscape.

The thesis is based on four qualities affecting sustainable landscape. The qualities are: Physical qualities, ecological qualities, individual use qualities and social qualities. The integration of these qualities covers two pillars of sustainability which are environmental and social sustainability. The two first qualities target how physical urban properties could function efficiently performing the required benefit and at the same time serving and protecting the ecosystem. The last two qualities focus on another factor which is the user.

The first four chapters included theoretical data from literature, reports and best practices clarifying the application of sustainable measures in landscape and its reflection on the university campus landscape. Physical qualities included: Connectivity, edges and gateways, different circulations on campus, spaces and facilities provided. This aspect focused on the efficient operation of campus and how to reach optimum cases related to urban design. Ecological qualities included: Water, vegetation, soil and materials. This aspect focused on less consumption of resources and energy, enhancing and protecting nature and returning back to nature resemblance. The individual use qualities included: Wayfinding, safety and identity. Individual use qualities discussed ease of movement, interaction and sense of belonging of users. The social qualities included: friendship formation, group membership, communications, spatial separation based on social characteristics, gender differences, participation and the impact of physical space on social space.

The methods used are deductive in the theoretical part reaching compilation of different elements to be added on the guidelines' checklist. Some relevant points from "SITES" rating system for sustainable sites were added to the list. The process of validating the list according to the guidance of expertise in the field of landscape architecture occurred. Questionnaires and interviews' questions were formulated to use for the selected case studies based on theoretical part. A cross- cutting relational table was generated to highlight the interactions between different qualities complying with the main target of sustainability creating a holistic and integrated approach.

The selection of the three cases –American University in Cairo (AUC), German University in Cairo (GUC) and British University in Egypt (BUE) - was based on recently opened campuses that could be more manageable and updated to

apply the measures of sustainable landscape. The three campuses are of different sizes sharing the desert common environment. Cases were analyzed according the checklist by visiting the cases and discussing points with units responsible for landscape management on campus. Questionnaires were distributed online and interviews were conducted to understand further relations on campus from different users.

According to the studied cases, the sustainability of landscape is still only achieved in limited fields especially the ecological qualities. Physical elements are mostly fine due to the good design of campuses especially the AUC. Even though AUC was the only campus of the three cases having actual steps towards the implementation of sustainable measures before construction and during operation, many aspects are still not achieved. Many elements need to be taken into consideration before construction as water systems, vegetation and soil. The main motive is the economic benefit in most cases while the ecological benefit is not obvious. The study resulted in a comprehensive comparison highlighting the main applied measures and main defects, a cross-cutting relational table for each case showing the integration between qualities positively and negatively, and the classification of the compiled checklist showing the degree of application.

TABLE OF CONTENTS

LIST OF FIGURES