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Cairo University

THE RELATIONSHIP BETWEEN DESIGN OF URBAN STRUCTURE AND ACHIEVING DEVELOPMENT

By

Ashraf Sami Mahmoud Elsayed Abozeid

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY
in
Architectural Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Under the Supervision of

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**The Relationship between Design Of Urban Structure and Achieving
Development**

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Summary :

Urban Structure design is considered a critical pillar that plays an important role in shaping the urbanization process. The thesis tries to figure out whether urban structure impacts the development rates on the national and local scale. Studies and analysis are carried out on the macro and micro scale to investigate the correlation between development and urban structure formulation. The thesis is developed to include an international analysis for countries and cities in Europe and North America representing the developing countries that achieved high rates of development. From the analysis results recommendations are developed and applied to reach an urban prototype model on the neighborhood scale and tested on the city scale

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.

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The Researcher

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Abstract

Urban Structure design is considered a critical pillar that plays an important role in shaping the urbanization process. The thesis tries to figure out whether urban structure impacts the development rates on the national and local scale. Studies and analysis are carried out on the macro and micro scale to investigate the correlation between development and urban structure formulation. The thesis is developed to include an international analysis for countries and cities in Europe and North America representing the developing countries that achieved high rates of development. From the analysis results recommendations are developed and applied to reach an urban prototype model on the neighborhood scale and tested on the city scale. This thesis tried to present a comprehensive overview and a brief study about the city fabric and its urban structure. The research started by explaining the meaning of a fabric, its elements and parameters and the main factors that shape any city structure. The research then summarized the fabric typologies into two main characters Compact city model and sprawled one. An approach to reach the urban fabric typology that achieves the best results of development and sustain the economic growth is the main goal of this research. Consequently, A deep research was carried out about the meaning of urban economies, its theories, recommendations as a way to understand what are the forces that boost an economy or decline the growth in another. It was concluded from the study that there are two main approaches for agglomerating economies either localization or scale economies that depend on labor division and specialization in order to achieve mass production mainly standardized job style, or urbanization economies that rely upon diversity of uses in a collaborative intellectual working style. A method to translate and reflect these forces upon a fabric typology that incubate these elements together in a harmonic way was developed.

The main idea of the proposed model was to achieve a polycentric fabric on the macro and micro scale. On the macro scale, a poly independent connected neighborhoods shape the city image whereas the main autonomous unit is a neighborhood. On the micro scale each neighborhood consists of clusters that are diverse in the residential typologies, and employment life style. The main approach of designing the neighborhood unit is to lay upon two main economic bases. The first near the center which is the administrative diverse intellectual base where the mind of the urban fabric is situated. As we go away from the center high tech. industries appear where the creative residents are allocated. Further away, the second economic base start to appear which is the scale industries that depend upon mass production and high number of employees. It is worth saying that the sense of ambition is found to motivate residents to gain high level of education that candidate them to move on and live nearby the center and at the same time it provides the aspect of just not equity between the different residents categories. High residential typologies are allocated in between the different connected neighborhood making good use of the spatial area between them to be luxurious green lung that benefits the whole city as well. Last but not least all neighborhood are connected through different transportation axes achieving the idea of transit oriented development neighborhood instead of the traditional neighborhood.

Chapter one : Introduction

Research in brief

Urban structure has been in most of the times the main factor that influences the urban planning process. The design of the urban structure was a main contributor to the urbanization process since the old centuries. Design of the urban structure does not only mean the basic elements that shapes it, it includes the functional aspects associated within the fabric or what is known by Urban Metabolism (a microscale approach). In this thesis, Urban forms are presented in a different way, the main target or goal is to determine the relationship between the fabric design and the development. In other words, the thesis will highlight how the urban web or structure design forms play an important role in fostering the development process through any urbanization process. Urban structural forms are addressed in a unique way through explaining the two main urbanization process trends “Urban Sprawl and Compact City Model”. These two forms were main subject for the debate about the optimum urban form along the previous decade .The thesis will present the two forms in a non-biased approach where the main causes, positives and negatives of each form will be clarified. Moreover, the research will not stop at this point, a trial to find out how each form foster the development will be presented as well. In addition to that, Urban fabric will be addressed from the macro scale; The urban morphology will be taken into account not only the urban form elements (Microscale approach). The research will explain how the macroscale influences the development dramatically .

Research Problem

Urban structure design forms have been a great dilemma for all experts and planners for them along the last century. The effort they exerted along the last decades in order to reach the optimum city fabric has been the main issue for their research. Up till now there are no obvious guide lines about the best fabric. This research tries to figure out a prototype for city fabric that could be applied to all city plans from an economic approach. This research provides a model that can achieve the best fabric reflected on achieving best development results.

1.1. Research Hypothesis and Methodology

Planning of urban structure plays an important role in shaping the development process

