

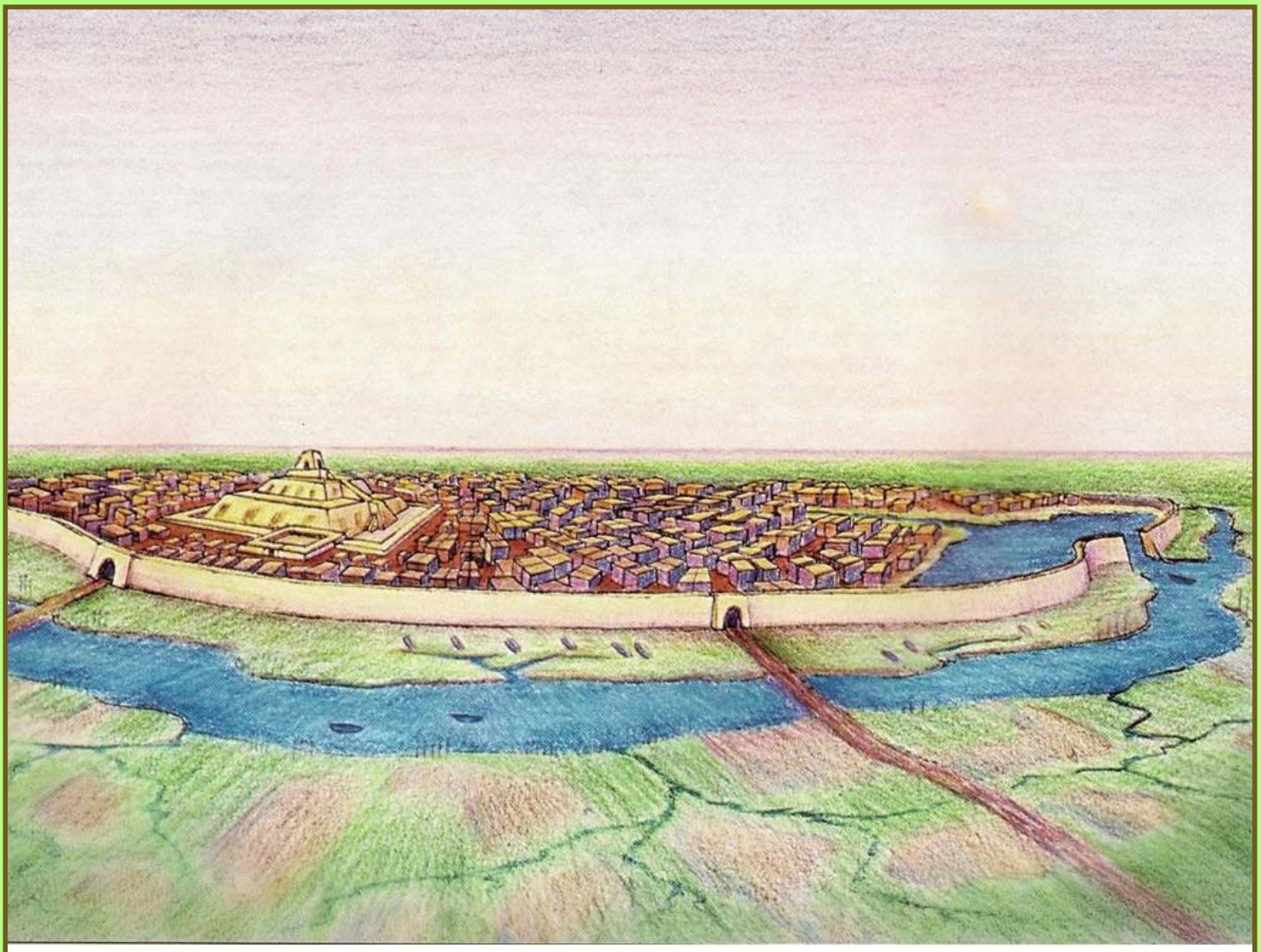
https://dspace.org/

A growing city: agriculture and food security in the growing urban context

Tarboton, Ian

2013-08-02
http://hdl.handle.net/10539/12970

Downloaded from a DSpace repository. https://dspace.org/



The city in competition with the surrounding land. Image source: World History, 2012

Introduction

Chapter: 1

Food is something that concerns every living creature. It affects humans, rich and poor, without exception for money matters not when food supply is insufficient. Food is therefore a great equalizer. It is one of the basic things that keep us alive. But just how well it does that depends on numerous factors.

This thesis is about quality of life. An inquiry into food ultimately leads to numerous other factors, all of which affect quality of life. Food is that which enables us to grow. This can be used in direct translation of consumable plants and meats that enable the human body to grow; but it can also be a metaphor for the sundry sources that allow for other things to grow, things such as buildings and cities. While these are inanimate objects what is meant by them growing is that they are made from nothing and then expand further, or decrease and degrade.

Thus there are different forms of food, leading to different forms of growth. As an architectural thesis, the areas of interest here are how cities and buildings grow and how they affect quality of life. Since consumable food equalizes people from any walk of life it became the focus of this study leading to investigations into how urban growth and densification affect food production and distribution.

In looking at the factors that affect food production and supply, certain links can be found between the urban and the rural. The difference between these two types of human settlements is often considered to be agriculture. Through research this thesis shows that these links are not altogether beneficial, not immediately for the rural anyhow. What is less noticeable, however, is that because of this lopsided relationship which seems to benefit the urban, the urban is and will be stunted in its growth in the future.

Every action has a consequence, and as shown in this thesis the consequence of urban growth at the expense of agriculture and the natural environment is a reduced quality of life. Therefore consideration has been given into how these things can grow together, how they can benefit one another, how they can coexist; in a phrase: urban agriculture.

Urban agriculture is not a new topic of conversation. It is not novel by any means, but is in fact as old as city life itself. Because people need food they have always produced it. For most people throughout history this meant producing it in their own garden, whether they live in cities or not. Others were content to buy their food from a market where someone else produced it.

Industrial farming is what we see today as the dominant means of agricultural production. That is to say huge areas of land are owned by individuals and planted in such a way as to create mass production of food on behalf of the majority of the population. These huge areas of lands are usually planted with very limited variations of crops, sometimes the same crop will continue for many hectares. This thesis looks into the effects of this industrial agriculture on food production and ecosystems. Anything to do with agriculture is inseparably linked to the natural environment, for the natural environment determines in large part how well agriculture grows.

But what is found in this thesis is that firstly industrial agriculture is failing to put food in every mouth in South Africa, for reasons discussed later in this thesis. Therefore more land would be needed if current farming methods

continue, but all the while the appetite of the city in insatiable. It is expanding its footprint ever outwards, eating up agricultural land. And through the habits of urban life more and more of every resource is consumed. This puts us in a pickle, so to speak, for more land is needed to produce food, but more land is also needed for the city to grow. Unfortunately the compromise normally leaves agriculture at the bottom of the food chain.

Many people have noticed this in the last few years and even decades, and this has led to an exploration in modern methods of urban agriculture. An expression of this can be seen in the many projects of vertical farming – farming inside tall buildings in the dense city centres around the world. While few of these ever get built they provide a good study into ways in which the city can accommodate the production of its own food. Yet these projects still give off a feeling of industrial agriculture, where a few people are mass producing a lot of food for lots of other people.

The main research question of this thesis is: In a growing city, how can an architectural intervention improve food security and quality of life?

This thesis is not to be misunderstood for it is not advocating a return to a majority rural lifestyle. Rather it seeks to grow food and the city together so that as the city expands so too does food production. It looks further into the individual benefits of producing one's own food, or at least of being aware of how food is produced. It considers the factors which lead to quality of life, which show time and again to be largely unrelated to physical things but rather are intangible and spiritual.

However, the spiritual can be affected by the physical and it can learn from it too. Therefore this thesis looks into how the physical environments in which we live affect quality of life, our wellbeing. What is found is that certain things plainly decrease wellbeing, and others plainly increase it. Through urban agriculture this thesis tries to introduce those things which increase quality of life back into a situation which is rife with destruction and poor quality of life.

The structure of this book follows on from this introduction by looking at how cities growth and how that growth affects the cities, agriculture and the natural environment. This is compared to Thneedville, from Dr. Seuss' The Lorax. The reason this comparison was included is that The Lorax is a book which describes very well and very briefly the ways industrial cities grow and the effects they have. The book shows how over-consumption in the present causes death in the future – death of the natural environment and the city. This chapter looks at the factors related to urban growth and food security, identifying who is in greatest need of food and how that need can be met.

The next chapter investigates different things, physical and phenomenological, that can help to improve quality of life. It looks at things that calm the human brain and allow for good mental health, which ultimately leads to good physical health. Such things as biophilia, that is celebrating the natural environment and its goodness for human wellbeing, as well as biomimicry, that is learning from nature how to make conditions conducive to life, are explored in their relevance to and application in architecture.

Different methods of farming are discussed. These methods are conducive to producing high yields at high quality and in small confines. They are methods which not only produce food for human consumption, but also leave the environment fit for thriving ecosystems, often improving situations in which they sit. This chapter also looks at precedents of urban agriculture and other forms of architecture of interest to this thesis design project. Global and local examples are looked at.

The fourth chapter identifies what criteria define a site that can address the concerns raised in this thesis. These concerns are related to food security and environmental state (not only natural environment but also urban environment). It then analyses the site which best fits all the criteria and considers what contextual factors are advantageous and what factors need to be improved.

It looks at what program needs to be accommodated in order to make a successful urban agricultural intervention which addresses the needs of the city. Thus a brief is developed for the design. This thesis does not seek to solve all the problems in the city which relate to food and quality of life, but rather to intervene in a small leverage point, from where future development could be sparked.

The fifth chapter discusses the process of design. It speaks about what factors are important in determining the design and how they were responded to. Biomimicry, as a major design driver, is applied in this chapter and led to the architecture seen in this thesis. This chapter shows the design drawings and explains the gestures made in the buildings and site development.

The fifth chapter also includes a technical study into various aspects of the design, from systems to technology, including tectonics and assembly.

Finally, in chapter six, the thesis concludes, showing how the design implements a systems-based approach in order to address the issues of concern to food security and quality of life. it discusses the relevance and success of using biomimicry as a design tool an encourages other ways in which urban waste can be revived and recycled.

