SKYSCRAPER

A Solution for the Sprawling City.

By

RejaHumayun
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This thesis is submitted in partial fulfillment of the requirement for the degree of Bachelors of Architecture, from Indus Valley School of Art and Architecture.

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SKYSCRAPER - A Solution for the Sprawling City.

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Research Question

What can be learnt from the analysis of existing skyscrapers around the world to be applied in our context?

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**ABSTRACT**

Height has always been a symbol of power and development, competing cities show there development to each other through tall buildings. On the other hand, land issues have also lead the architecture to go multi storey. The reason why we need to make a conscious effort to build a multistory building is in order to control the un-ended sprawl of a city.

The term multi storey automatically leads a person to think of not just multiplying the floors, but also the energy and resources that goes into its construction. In order to compensate that, we need to build *green*, so that a building can generate its own resources.

The following paper verifies the need for building vertical in Karachi while highlighting the various complexities involved in the process and the various psycho-social effects tall buildings have on a city and on its people. It also sheds light on the argument of skyscrapers serving as global icons and whether that is a good pursuit in our context.

This research has been done with the help of various books that shed light on not only the context but the technique and technology behind skyscrapers. Analysis of various skyscrapers around the world was carried to study their different effects and learn from them in order to apply it to our context. The tools employed for this were theories of architects along with the case studies. Since not much work has been done in this regard in Karachi and theoretical knowledge is not available, hence informal interviews were also conducted.
The above research validated the need in Karachi for building vertical while making it sustainable and juxtaposing it with the existing layer of architecture. The research also suggests that the various socio economic as well as psychological effects of vertical buildings on people in general and society as a whole need to be studied and addressed to ensure that they have the best possible impact on our city.
**INTRODUCTION**

Karachi is one of the fastest growing cities of Pakistan. It is also the center of trade and finance. Every year a lot of migrants flock into the city seeking for a better life and job opportunities, and this influx results in an increase in population and congestion. The business centers and cultural hubs of the metropolis are getting tighter day by day.

A lot of construction, traffic and increase in population are the reasons behind making the old parts of the city congested. The resulting rise in the land prices is forcing people to move out from the centers, thus the city; Karachi is sprawling in all directions. Sprawl can be vertical or horizontal but if we take example of Karachi, the sprawl seems to be horizontal and it needs to be controlled. Because it tends to decentralize the city as well as creates transportation issues and other related problems; such as electricity distribution issues.

Bearing in mind all these situations in a city like Karachi, the time has come to give special attention to understand the high rise construction as an answer for this matter. There are multiple ways in which this sprawl can be controlled; one of them is to start building higher, the main centers of Karachi such as the I.I. Chundrigar road in Saddar, have started to go vertical. The I.I.Chundrigar road is an important thoroughfare in Karachi because it holds the main business companies. A lot of other areas in Karachi are going higher in order to save on initial investment on land, because land prices are high, and ever-increasing. However building vertical should not cross the limit that it becomes a vertical sprawl.
An interview was held with a real estate agent ¹, according to whom building 8 storeys on one plot is much cheaper than buying 4 plots and building double storeys on them.

For one, higher buildings tends to consume more energy and resources; as Ken Yeang, who is an architect of green high rises, states in his book, that the skyscraper is not an eco-friendly building type ². It is an important factor to look upon, because it will affect a lot of things in a city.

Although Karachi has now started to develop vertically in some of the areas, but this does not seem to be a very positive addition to the city in terms of giving back to the environment. If instead one make these high rises green, as a result this will not only reduce distances between different areas in Karachi, but it will also give back to the city in terms of being green and become an addition to its resources rather than just taking from it. It will also result in a healthier environment to live in, and according to Le Corbusier’s ³ theory, we should build such that we reduce our built and therefore foot prints of the built and leave open spaces proportionately for parks to make our city green.

Despite having numerous advantages, going vertical also holds a lot of negative points. Such as; the connection of the building with the street gets lost resulting in isolation and disconnection, with its surrounding. One can explore this phenomenon in various types of the building.

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¹ Estate and Estate; Clifton, 021-35821059
The objective of this dissertation is to verify the need of multi-storey buildings and to explore the various aspects attached to a high-rise building such as; social, psychological, and economical impacts of tall buildings on a city and its architectural development.

**What can be learnt from the analysis of existing skyscrapers around the world to be applied in our context?** It is the findings of this study of the various aspects of a skyscraper that will determine the skyscraper’s potential to add positive elements to a city.

At the same time the fact remains that there is a lot of architecture that has already been built in Karachi over time. It is neither practical nor possible to remove all the buildings and start to build a new and improved version of a city all over again. One needs to respect and conserve the existing horizontal layer in order to save the architectural heritage of our city, while adding vertical layer to these buildings that speaks of its time and hence also responds to the current needs of the present time; of which the most demanding is mainly of building sustainable (green).
LITERATURE REVIEW

For the purposes of my dissertation I am interested in sustainable vertical architecture. In order to be able to better understand this topic it is first important to understand the need for going vertical and then the need to make those vertical buildings sustainable as well.

There is no specific formula for a building to be called as a Skyscraper that totally depends upon the context it is standing in; for example, pyramids were the tallest structures for thousands of years. To build a skyscraper a lot of technical engineering goes into it. Bobbi Searle in his book Look inside a Skyscraper has very interestingly explained each and every aspect of a skyscraper, from the first skyscraper that is; the pyramid of Giza, to the present day skyscrapers; which are competing with each other day by day.

However first it is important to understand the context in which the vertical building is placed. Karachi has grown monumentally over a period of years from fishing village to the largest metropolitan city of Pakistan. The book, Dual City Karachi, by Yasmeen Lari helps to give a sense of Karachi’s past image and its future growth. Basically, this book shows the evolution of Karachi's urban fabric and architecture as influenced by the political order of its time. It shows and also highlights how, from a small port town, Karachi has now sprawled into the largest metropolitan city and is now included in the 20 largest cities of the world.

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Rapid urbanization has led to urban sprawl, which is a phenomenon where a city grows to its suburbs and beyond. This in turn, has a lot of negative consequences and ill effects both on the psychological and moral health, and well being of the people. Arif Hasan, who is one of the leading urban planners of Pakistan has highlighted these and other important urban issues related to planning and the architectural development of Karachi in his book *Understanding Karachi, Planning and Reform for the future*\(^6\) in which he talks about the main reason of the drastic increase in population that is; migration. This migration is mainly in search of jobs, and people come from same areas in groups and form small clusters in different areas in Karachi, which has also effected the ethnic composition of the city.

This urban sprawl is not a new phenomenon or something specific to our context only. Visionary architects of the past realized the intensity of the situation and formulated theories that have provided what we may consider possible solutions for these situations. Le Corbusier in his book *The City of Tomorrow*\(^7\)-described a detailed outline of how future cities need to be designed. Le Corbusier laid out four fundamental principles:

1) Decongestion of the centers of the cities.

2) Increasing the density in high rises.

3) Increasing the means of circulation. Improving and expanding infrastructure.

4) Increasing the area covered by vegetation.

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Corbusier suggested that the central core of the city be made up of sky scrapers, which should be used mainly for commercial purposes, but these skyscrapers should not occupy more than 5% area, and the rest should be green (parks, trees etc.) Also, with regard to sprawl control he advocates that a city should be compacted within certain boundaries.

Hilberseimer known as the “mathematical urban planner” also gave his vision of a high rise city in 1924. He called it the Huchusadat, 8 or the vision of a high rise city. Contrary to Le Corbusier’s scheme, who has emphasized separate centers and locations for residential and commercial spaces, in Hilberseimer’s scheme, residences are placed on top of commercial buildings. Le Corbusiers’s and Hilberseimer’s discussion has emphasized the importance of a skyscraper.

In a report by Duco William Uytenhaak, he draws comparison between their theories. He states that a lot of the same aims had to be achieved in the plans ‘unevillecontemporain’ and ‘Hochhausstadt’ by Le Corbusier and Hilberseimer. Different ways were designed to separate; pedestrian and vehicular movement and to separate work from residential. They thought that by denying historical and geographical elements they will be able to eliminate the chaos of the modern city. Hilberseimer and Le Corbusier created cities of such total control, which only governments could impose. Their ideas were mainly based on starting a new city from scratch.

This appears to be in direct contradiction to Aldo Rossi 9, who stated in his book Architecture of the City, that city is an urban artifact, where the city is characterized by its own history and form. He essentially prioritized function over form; according to him,

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any form of the building can accommodate any function. The city must be valued as
construction over time.

According to him evolving a city holds much more value than building it all over again,
we should alter and make changes according to the needs of that time. This rule can be
applied to Karachi also, that we can alter and add things keeping in mind today’s
problems and demands.

While adapting technology and modern design, we should not disregard the heritage of a
city, as that has given a language, an identity to a city. Adding layers to the existing
architecture is always better than starting a new one all over again. Architecture of the
City, by Aldo Rossi\textsuperscript{10} has strengthened my point of layering of a city.

Another book, Cities, Design and Evolution, by Stephen Marshal\textsuperscript{11} talks about the same
principles, that a city which has been layered over time has more value, as compare to a
newly designed city. He says in his book:

“ How do we recreate the kind of good old urbanism that was not master-planned in the
first place – the kind that perhaps evolved incrementally over a long time. ”

New is always better than old, but it is the opposite in city planning.

As a counter argument of Le Corbusier’s city vision, I have read and analyzed another
modern master Frank Lloyd Wright’s city perspective; he has designed a prototype Broad

\textsuperscript{10} Rossi, Aldo. Architecture of the City, Translation in1984, MIT Press.
According to Frank Lloyd Wright the solution for congestion of city centers is to sprawl, because he says that if we have all the resources for transportation then why we should not utilize them. But the thing is that if we examine our situation, we do not have ample resources to sprawl, so it is better to come towards the city center and be compacted according to Le Corbusier’s.13

A skyscraper has many connotations attached to it, referring to the book *Skyscraper: Design of the recent past and for the near future*, by Eric Howeler14 has helped me to understand and analyze the conceptual background behind skyscrapers. The identity that a skyscraper gives to a city is more of a symbolic or iconic sort. He talks about how a skyscraper should not be just a representation of the improved technology or the advancement of a city; it should also act as an image for the city that reflects its heritage, culture or religion. I have analyzed Petronas Towers, Taipei Financial Centre and Jin Mao Building, which he defines in his book as buildings that represent the religious or traditional aspects of their respective countries. That has helped me to understand what elements should be considered in order to make a skyscraper more contextual, rather than alien to where it belongs.

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Building vertical, besides being a necessity, also plays other roles rather than just fulfilling functional requirements; like a shop needs a signage similarly a city needs an image for itself to attract tourists and other economic trade. Architecture plays a vital role in creating an image for a city; it is a fact that can not be denied.

I am including a different perspective about this vision by a well known architect and researcher of Karachi; Arif Hasan, he is totally against the phenomenon of going vertical to improve the world class city image, he talks about the impracticality and superficiality of this concept in his article _The world class city concept and its repercussion on urban planning for cities in the Asia Pacific Region_. According to him, high rise cities does not have any friendly accommodation for hawkers and informal businesses of low income, rather it is just a tourist attraction place.

An article _Saudi Arabia to Build World’s Tallest Building_ in Archi times mentions that the deputy editor of the Architects Journal, Rary Olcato, England criticized this development; he said: _The race to build tallest skyscraper is rather useless – where will it stop? This building is the symbol of the old mindset._ Hence for Karachi, we should first look at solving the issues of sprawl through building high rises rather than just aiming to build them to compete with the rest of the world.

It is a known fact that the higher your build up the more energy and resources are consumed. So it becomes essential to highlight the importance of a tall building to be

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green. When talking about green high rise buildings, it automatically becomes important to study Ken Yeang’s theory because he is known to be a pioneer of green-skyscraper and has written many books on this topic. In order to have a better understanding of his research and design principles I have read one of his books Eco Skyscrapers\textsuperscript{17}. This book of Ken Yeang’s has strengthened my argument to make green high rises for the better future of our city, and healthier environment to live in.

\textsuperscript{17}Yeang, Ken. \textit{Eco - Skyscrapers}. 2007, Images publishing, Hong Kong/ China. Print.
RESEARCH METHODOLOGY

To put forward this research I will first define what a skyscraper is and why the need to go vertical exists. The tools that I have used to build my discussion are, theories supported by case studies and interviews.

Firstly, it was really important to analyze skyscrapers throughout the world, in order to understand their need, impact and various other aspects such as giving identity to its origin. Building vertical directly affects the urban morphology of a city and its infrastructure. In order to understand the different perspectives for a city in a historical context, I have read Le Corbusier’s and Frank Lloyd Wright’s theories on city design. Both have completely contrasting visions as to how a city should be built.

Arif Hasan, a well known Architect and an urban planner, has a very strong opinion about going vertical and its impact. In order to understand that, as a counter argument to what I am advocating to, I have read his article World Class City Concept and its Repercussions on Urban Planning for cities in the Asia Pacific Region.

Talking about green skyscrapers it is important to mention Ken Yeang and read up on his theories on green architecture. Ken Yeang is a Malaysian architect; he is one of the pioneers of bringing the green building concept forward.

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His peers have regarded him as a man who is ahead of his time. He recognized 40 years ago that global warming and increased contamination of the environment would badly affect the natural balance of biodiversity and ecosystems.

Aldo Rossi was an Italian architect; he has achieved awards for his architecture, theory and product design. His book *The Architecture of the city*\(^2^2\) talks about layering of city; I have taken a case study in order to understand the pros and cons of constructing a multistory building of a modern language on an old building. It has been done in a building of New York.

I have studied the following building as a case study for better understanding.

- **The Hearst Tower, New York City.**\(^2^3\)
  
  The old building was completed in 1928 that is acting as a base for the new skyscraper on top designed by Norman Foster. The original cast stone facade has been preserved in the new design as a designated landmark site. This building is certified as first green building in New York City by LEED.

As I have mentioned earlier, going vertical has various aspects attached to it, one of the most important factors is that it gives its region an identity or represents some of the aspects of its culture/religion or tradition. In order to get a better understanding as to how a skyscraper can represent some religion or culture, I have analyzed the following two projects that have strengthened my argument.


\(^{23}\)The Hearst Tower, [http://www.greendesigntc.net/buildings_07.pdf](http://www.greendesigntc.net/buildings_07.pdf)/DeMauro_Frank_Hearst(paper).pdf
• Petronas Tower, Kuala Lampur, Malaysia.\textsuperscript{24}

These twin towers designed by Cesar Pelli, were completed in 1997. They are one of the most famous skyscrapers in the world. These are the tallest of the twin towers in the world. These are 1,476 foot high towers, with a sky bridge connecting the two.

• Taipei Financial Center, Taipei, Taiwan\textsuperscript{25}

Designed by C.Y. Lee and partners, it was the world’s tallest tower when completed in 2004, until the opening of the BurjKhalifa in Dubai in 2010. It is a 101 storey high building.

Interviews become important because there are not many local theories that are available on this topic. Therefore in order to get a better understanding in this field of study, their knowledge becomes crucial for us to understand how this problem applies/exists in our context.

Hence, an informal discussion was carried out with Architect Suneela Ahmed, who has been working since many years with ArifHasan. She knows a lot about urban development’s future and how it should be. It was important to have her opinion about going vertical and green architecture, in order to calculate its feasibility. The informal interview raised a number of questions, which helped me in making connections in the things that I am discussing in my dissertation.

\textsuperscript{24}Petronas Tower, Kuala Lampur, designed by Cesar Pelli, 1997.\url{http://www.petronastwintowers.com.my/internet/pett/pettweb.nsf/frm_home_hi?OpenFrameset}

\textsuperscript{25}Taipei Financial Center, Taipei, Taiwan, designed by C.Y. Lee and partners, 2004.\url{http://www.emporis.com/application/?nav=building&lng=3&id=100765}
An engineer’s contribution in making a building green is as important as an architect. It requires a lot of systems to be designed and integrated in order to make a building green. Hence, I felt it is important to interview an engineer as well. I have interviewed Sir Ainulabidin, who has been closely associated with architects in order to make a building green through installing cogeneration plants.  

Being the green consultant engineer for many buildings, he has a better understanding of what is people’s demand in concern with making a building green. He has supervised MCB tower to perform as a co-generated building. A visit to MCB tower has been done in order to get a better understanding of the green aspects as well as, how it has affected the surrounding by being the tallest building of Pakistan. The visit has helped in order to understand the impact of a 28 storeys building on its surrounding.

To further elaborate the importance of a green building, I will discuss about PGB (Pakistan Green Building Council) that is in process to be established. A little discussion will be about the ARCASIA conference that I attended at Lahore in 2010, which mainly catered to spread awareness about green architecture.

All the above mentioned will be used in order to tie up the elements that are essential to be discussed in order to have an extensive understanding on the topic that I am aiming to cover in this research paper.

26 Interview with Ainulabidin; a consultant engineer for green buildings.

27 Interview was held by DAWN news with Mariam Hyder; an active member of IAP and has been IAP’s chairperson.

28 ARCASIA, StudentJamboree on Green Architecture, Lahore, 2010.
SKYSCRAPER

- A Solution for the Sprawling City.
• **URBAN MORPHOLOGY OF KARACHI**

Urban morphology is the study of the 3 dimensional development of a city, whereby one sees a transformation of the city over time. It seeks to recognize the spatial structure and character of a town or city by exploring the archetype of its component elements and the process of its development.

In order to seek a healthier future vision for Karachi, it becomes important to understand the past and present state of the city. The progress of civilization also influences that of its buildings, commencing with the single and two storeys and advancing with time to facilitate skyscrapers.

Karachi remained a low rise city for many decades, till a 6 storey building was developed in the 1950s named Mohammadi House in Tower Area, Saddar. The trend continued, and then Habib Bank Plaza was built very soon after that, in 1963;\(^\text{29}\) amazed by such a building, people used to go and see it, as if it was a tourist attraction.

Over a period of time, the trend of apartments came; this was a boost of opportunities and finance for developers and builders. It became more economical to accommodate more than one family in a single plot. Since there elevators were not very common at that time, so apartments were built only up to 4 floors, so that people could walk upto their floor.

I.I. Chundrigarh road in Saddar, is home to many multi storey buildings; mostly offices. Buildings that are competing in height amongst one another; each is aiming to be higher than the other. MCB tower, a 26 storey building that got built in 2005 in this area, was a positive addition not only for that area but also for the city.

![Figure (ii) MCB tower.](image)

Later on areas like Gulistan-e-Jauhar have developed where the major part of the area consists of apartment buildings only. Even in residential areas like Gulshan-e-Iqbal, people have started building on top of their single storey houses; thus, these have now
became double and triple storeys houses. But the only issue with these multi storeyed buildings is that, it has also increased the electricity, water supply, and sewage disposal problems.

Karachi has been sprawling over time and a lot of small colonies and towns have been created; for example Gulshan-e-Maymar, Safora Goth, Surjani Town, Bhens Colony etc. Numerous areas like these are getting more and more heavily populated every with passing day.

- **THE NEED TO GO VERTICAL**

Every year people migrate to Karachi in search of jobs; some migrate alone leaving their families back in their hometown, whereas some migrate with their families, in both cases they require some land to live on. Their earning is not enough for them to be able to afford land at the center or around the center of the city. Hence they find shelter in the suburban areas of the city. This continuous increase in population has resulted in the spreading of the urban fabric, but after a while this spread has taken the shape of a never ending sprawl in the city. This horizontal development is getting out of hands. We have lost one city center, having multiple city centers divides the city into parts, which results in the phenomenon of city within a city. Nobody knows where the city ends, and where the suburbs begin and how this unnatural extension of the city can be controlled.

To cover these distances we have to travel a lot on a daily basis in order to reach our work places or institutions, although there are multiple vehicular ways available to cover these distances, but that makes the traffic issues worse. If we observe the city, especially
in the morning, the traffic situation is a disaster. And it also hugely adds up to the cost of the fuel and as it is our country is facing a fuel crisis. Plus a lot of vehicular movement immensely pollutes the city, which is not only harmful for human health but it also affects the architecture of the city.

However, it is only in recent times that the term ‘greenliving’ has become very popular due to the lifestyle that has been adopted. The more that one is advancing in technologies etc. the farther one seems to go from the nature. Our earth has been polluted so much that it has now become a necessity to make a conscious effort to make everything green.

Rapid urbanization, along with the increase in population has resulted in the sprawling of the city in all directions. However, it is neither feasible nor practical for a city to spread beyond a certain distance. Add to it the current fuel costs, wastage of time in conveyance from one place to another and high land prices; hence one comes to the realization that building vertical is the good sustainable solution to the growing demands of urbanization.

In order to proceed with my argument I will briefly go through the visions of a city of two most influential masters of architecture Frank Lloyd Wright30 and Le Corbusier31, I have chosen their city’s visions in order to have a completely distinct perspective of a city plan, because the former promotes the idea of a sprawled city whereas, the latter talks about a compacted city.


Frank Lloyd Wright, in his proposed prototype broad acre city, has brought all work places to the center of the city and proposes that the residences should be towards the suburban edge; free from all the hustle bustle of the work place. Huge green fields owned by the inhabitants, will be in their residential area. He advocates the idea of a sprawled city by stating that:

“If we have all the resources to travel from one place to another then why not sprawl towards the boundaries of the city.”

Whereas, Le Corbusier in his book The City of Tomorrow describes the ideal city to be compact and with very ordered geometry. He mentions in his book

“We must increase the open spaces and diminish the distances to be covered”

He emphasized on the construction of skyscrapers even in the time when there was a lot of land available, his main motto was to utilize the technology available and how this technology could be used to reduce distances between work places, institutions, and residences etc, so that we do not have to travel a lot by vehicles on a daily basis. It would also save our fuel, energy and time. He proposed tall towers for offices in the center of the city and since there was no dire shortage of land, he proposed big open spaces around the tall office towers and preferred green spaces catering urban scale, rather than having small courtyard type plans.

Wright, Frank Lloyd, *The Dissappearing City*, Broadacreciy

The availability of resources also allowed the building of multiple storeys. This in turn provided the advantage of leaving the rest of the space open for agriculture or parks. These green open spaces were needed at that time as well as today in order to make the environment healthier to live in.

It becomes apparent from studying the theories of the masters that they not only visualized the need for going vertical due to land shortage but also envisioned and understood the need to make this development people and environment friendly. That is they understood the need to make buildings and entire cities green and hinted at making them sustainable.

- **PSYCHOLOGICAL IMPACT OF A TALL BUILDING.**

For thousands of years, when going vertical was not a necessity, verticality in architecture, with its high costs, excessive labor and superior technology came to represent supremacy and esteem. Going vertical has always been an objective by kings, emperors etc to show their power.

![Figure (iii) Egyptian Pyramids.](image-url)
If we look at the pyramids\textsuperscript{34}, Pharaohs made these tall pyramids in order to portray themselves as the highest and the mightiest, and as a display of power to the entire kingdom. They remained the tallest structures for many years, until the Gothic cathedrals were built, which had the same intention behind their slender structures which further emphasized their verticality. It was the spiritual effect that they wanted to achieve through this notion, to be closer to God or going up towards the sky, to instill this spiritual power in people.

One may look at a Gothic building being either impressed by the pointed elongated elements reaching towards the sky, or may be filled with admiration by the distribution of stresses sensitively handled in the structure. Thus vertical architecture does not always represent just the lack of space but has for various centuries and still does impact a person, a people or even a nation psychologically.

![Figure (iv) Gothic Cathedral](image)

Another psychological aspect related to going vertical is that under-developed cities like ours aspire to appear like developed cities that possess such vertical tall glass towers,

\textsuperscript{34} Pyramids of Egypt, built in 2560 BC,
reflecting their prosperity and development. The reason behind wanting to build so many skyscrapers today is also a representation of power through architecture, and to show their development on the rest of the world.

The competition to go higher is not limited to one between various cities and countries but even within a city, the corporate buildings (office towers), the builders intend to go higher from one another in order to compete with each other and stamp their power to show their stability and gain importance in the city symbolically.

If we see internationally, Seagram building by Mies van der Rohe\textsuperscript{35}, is one of the buildings whose whole intention was to give an identity to the building. All the resources were spent on it in order to achieve that symbolic presence. It also sacrificed half the plot and gave it away for the public plaza, so that the public would come and appreciate the height of the building from a viewpoint where the building would appear soaring to sky.

\textsuperscript{35}Seagram building, New York City. designed by Mies Van Der Rohe, 1958.
In our local context, Habib Bank Plaza\textsuperscript{36} was constructed in 1963 back then, it was a huge achievement to build a 23 storeys high building in Karachi. Being the first tall structure of its kind in Karachi, it became an attraction for the common man. People used to come from all parts of the city to see this tower. Much later MCB tower\textsuperscript{37} was built in 2005. It was constructed in competition with the Habib Bank Plaza, and is 29 storeys high.

The competition amongst these towers within a city, attempts to provide a city’s image that almost every city is striving for, the so called global image is important for the further development of a city, because it reflects a city’s economic growth and development.

Nowadays the concept of a \textit{World Class City} or a \textit{Global City} has become very popular; all the cities are struggling to fall under this label. Basically if a city has an advanced transportation system, skyscrapers, or a major international airport etc. it comes under the label of a \textit{Global City}. At the present time every city is struggling to get this label, and to be part of this ongoing (never ending) race.

The famous architect and thinker of Karachi, Arif Hasan has spoken many a times and has also written about the global image that cities are running after and he immensely opposes it. According to Arif Hasan, the world class city concept is just about fooling the citizens by building a few glass towers, largest bridge etc. it does not solve or at least cater to the poor citizen’s problems, and questions how the label of a global city solves their food or shelter issues.

\textsuperscript{36} Habib Bank Plaza, Karachi, designed by Leo Aidly, 1963.
\textsuperscript{37} MCB tower, Karachi, designed by ASA, 2005
He defines the world class city as:

"According to the World Class city agenda, the city should have an iconic architecture by which it should be recognized, such as the highest building or fountain in the world..."\textsuperscript{38}

He says that the city has become something; as to what it \textit{should be} rather than what it \textit{needs to} be. According to him in obtaining a world class image of a city, people have totally ignored the local and cultural aspect of a particular city, the aspects that would have actually improved the image of the city. Also, informal businesses and hawkers have been disregarded totally, because as we go higher the connection from the ground gets loosened and a lot of families, who rely on the space of their homes to earn a living e.g. women cook and sell stuff at their gates, fish business etc, now do not have any means for their bread and butter, because due to going higher they are totally disconnected with the street. But a lot of people still think that amongst building typologies, only skyscrapers have the potential to create an iconic presence which can symbolize, or come to symbolize, a city.

Another unfortunate aspect in this regard was that with the easy availability of technology and with the discovery of the wonders of steel during the early part of the twentieth century, an ‘international style’ of architecture emerged bringing the world cities towards greater homogeneity. As it is, the boom of technological development in

\textsuperscript{38} Hasan, Arif. \textit{The World Class City and its Repercussions on Urban Planning for Cities in the Asia Pacific Region.} 23\textsuperscript{rd} issue, 2009, Architecture + Interior, Print.
the developed countries was tying all the cities through trading of construction material. With this the cities that were developing with time, started taking the same shape of the cities elsewhere. Later, cities modeled themselves on the already developed cities, copying not just their planning but even their style and language resulting in bad copies of the originals that lacked sensitivity to their surrounding context, culture and climate.

The psychological impact of these tall structures can be both negative and positive on a city; it can be a deceiving image for others about the city, but mostly, there are positive impacts because it can give boost of economy to the city.

- **WHAT IS IT TO BE VERTICAL IN OUR CONTEXT?**

With the term vertical; automatically skyscrapers is what occurs to us, but there is no specific height defined to be qualified as a skyscraper. Usually a building which protrudes above its built surrounding and changes the overall skyline, qualifies as a skyscraper. If we see Karachi’s skyline today; MCB tower and Habib bank Plaza are considered to be the skyscrapers of our city.

Keeping in mind the way the population is growing rapidly day by day in the dense urban fabric of Karachi, we have to consider the importance of building vertical to maximize the land usage and utilize modern techniques of construction, in order to control the endless sprawl.

While discussing skyscrapers, it is important to mention Chicago because it was the city that has introduced the concept of skyscrapers after the industrial revolution. New technological advancements made the construction of multi storey buildings possible. In
the 1880’s there was a boom of skyscrapers in Chicago; multi storey buildings were built one after the other and the cheap construction due to prefabrication has also allowed it and this development was appreciated a lot socially as well; that further motivated the construction of skyscrapers.

Architecture plays a vital role in representing the progress and stability of a city, because of its physical presence. Buildings also reflect the lifestyle of the majority of the population, and it of course also builds up a city and echoes its civilization.

Basically the need to go vertical in any city depends on the population growth rate, land use demand, business requirements, and of course how many storeys the available and affordable technology allows to go higher. It also depends upon the social factor as to what degree the citizens are accepting and appreciating the vertical construction of a city. If we see the world today, it is filled with high-rises competing with each other to
reach the sky. The building that we consider as skyscraper in our city is most probably will not get this title abroad. But MCB tower is the tallest building with respect to our context.

On the contrary, in Karachi we do not have any tall structure that competes with the rest of the world, but that does not make a big difference; because first we need to solve our basic issues rather than start thinking in terms of other things, for instance; building higher to compete with others.

Old parts of this city are becoming more and more congested because of the traffic, population and tremendous construction. Considering all these scenarios, now it is time to understand efficient design spaces in a city like Karachi with the help of High Rise construction.

Empress Market’s clock tower is so significant, that it became a landmark for that area. Its height was really important when it got built, it was visible from very far: but as the city started growing, the clock tower diminished in its context. Now even when you are driving on that road, you do not get to see it until you come really near it. It was known by the virtue of its verticality.

Figure (vii) Empress Market, Karachi
Building vertical has both positive as well as negative impacts. The advantages lie first and foremost in the savings for the cost of land, because as we go higher the built area gets multiplied, whereas the footprint remains the same; in this way many people get accommodated on one piece of land.

Stacking the floors has the added advantage of putting the plumbing together for many families in line from one floor to another rather than putting individual pipes separately. Costs get reduced by the sharing of walls, ceilings and floors. It also saves up on the infrastructure; costs get reduced due to the minimized requirement of pipelines, gas lines, roads and so forth.

Whereas if we talk about the negative impacts of building higher; the first thing is that it will require elevators, because beyond a certain height, people cannot walk up and down the building on their own. The higher you go the force of gravity reduces so pumping water to the higher floors cannot be done without supplemental equipment. All these things adds up to the cost of the building including the building material that is used. The higher the building is, the more you have to consider things like wind resistance, sway provision, and such other structural issues.

The higher you go the more disconnected you are with the street and it might also over shadow the surrounding buildings due to its height; for instance if we take example of MCB tower\textsuperscript{39}, its height makes the surrounding building diminish.

\textsuperscript{39} MCB tower, Karachi, designed by ASA, 2005
REDUCE DISTANCES

As I have mentioned earlier, constructing vertical buildings, reduces the travelling distances between places within a city, which saves up on a lot of fuel, energy and time. Here is an example that has really taken advantage of making a multi-storey building.

The Hearst Tower in New York City designed by Norman Foster, is an office building. Its original structure is there since 1928. As the business expanded, this branch was not enough for housing so many employees; so, they started spreading into different areas of the city. The primary purpose of designing a tower was to serve as a new home for almost 2,000 Hearst Corporation employees in New York City, which until that time had been scattered in rented spaces throughout the city.

Figure (viii) Hearst Tower

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40 The Hearst Tower, New York, designed by Norman Foster and Partners, 2006
http://www.greendesignetc.net/buildings_07(pdf)/DiMauro_Frank_Hearst(paper).pdf
A multiple storey building permitted the corporate offices to all be united and it really affected the workability of this company. The addition of a few more floors helped them to offer features like a subsidized fitness center, a corporate cafe, a theater, a broadcasting studio and a digital photography center, which provides the workers recreational activities, to provide a refreshing environment in the same building that will also enhance the productivity of the employees.

Another way in which vertical construction helps in the reduction of distances is that it helps control the horizontal spread of the city. When affordable residence is available near the city center there is no need to go out towards the suburbs.

- **IDENTITY FOR THE CITY**

Although the skyscraper is one of the most wonderful gifts of the industrial revolution, unfortunately its application has been extremely uniform. All the vertical buildings around the world incorporate almost the same type of technology and materials in their design. This results in a typical design language; that seems to be like glass boxes. Buildings do not speak of their origin or region anymore. Common observation shows that all the high-rises around the world look almost alike. There is a need to build these skyscrapers in a way that they respond to the climatic issues as well as reflect and be true to its origin.

Here are some examples that have actually taken such an approach and stand as regional and global identity: Petronas Tower, Taipei Financial Centre and Jin Mao Building.
Howeler in his book *Skyscrapers, designs of the recent past and for the near future*\(^4^1\) talks about tall buildings as icons for the city, or as the representation of the origin of its culture.

About the Petronas tower\(^4^2\) in Kuala Lumpur which is standing in a Muslim majority city, Eric Howler has said about Petronas: “*Visible from great distance, the decorative twin spires recall the diminishing profile of a traditional Islamic minaret.*” Petronas Towers shows the prominent symbolic power of the skyscraper, and has played an explicit role in establishing a national and cultural identity.

![Figure (ix) Petronas Towers. Figure (x) Traditional Islamic minaret.](http://www.petronastwintowers.com.my/internet/pett/pettweb.nsf/frm_home_hi?OpenFrameset)

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\(^4^1\)Howeler, Eric, *Skyscraper – Designs of the recent past and for the near future.* 2003, Universe Publisher, Italy, Print.

Another example is the Taipei Financial Center\textsuperscript{43} in Taipei that carries out a similar message, reinterpreting the Chinese multi-tiered pagoda as an office and hotel building. Similarly, the Jin Mao Tower in Shanghai, China which is an 88 storey building also recalls the Chinese pagoda forms. This building has become a model for tower designs throughout China. These structures represent development and modernization, yet still bring to mind the imagery of tradition and past.

\begin{figure}[h]
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\includegraphics[width=\textwidth]{figure_xi.png}
\caption{Taipei Financial Center.}
\end{figure}

\begin{figure}[h]
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\includegraphics[width=\textwidth]{figure_xii.png}
\caption{Chinese pagoda}
\end{figure}

INCREASE IN THE USE OF RESOURCES

The most evident negative point of a skyscraper is the use of more resources such as cement, paint etc. and time that is consumed in its construction. The other major thing is the use of electricity which multiplies with the floors and as it is, electricity is a big problem in our city. According to the by-laws having more than four floors requires an elevator for vertical circulation, thus existing shortage of power also makes necessary, the installation of power backup systems.

Considering maximizing the construction of multi-storey buildings, as a solution for lack of land, these high-rise buildings need to be a positive addition to the city; they need to be self-sufficient to an extent that their existence does not harm the city in terms of consumption of electricity and water.

If we talk about making a skyscraper green, the first person that comes to mind is of course Ken Yeang44, who is the pioneer of Green Skyscrapers.

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According to him:

“An ecological building should not be a weapon in a retreating battle. On the contrary it can contribute positively to the environment. A green area is a productive area. So the building can generate energy instead of consuming it.”

He mentions in his book *Eco Skyscrapers* that, skyscrapers are one of the most un-ecological building types because of all the energy and materials used to construct and to operate them. Skyscrapers should be made as green as possible, or at least we must lessen their negative effects. If we look at the systems of nature, nothing is wasted; buildings should be made in such a way so to adopt the same system.

An informal interview with Mr. Ainulabedeen, a green building consultant was held, he highlighted the main reason for all this sudden popularity of green environment. He says: “This green agenda has suddenly come up because of our own over consumption of energy plus the negative carbon emission that we produce”. He said that he is aiming for Net Zero Energy Building; he has been consulted on a lot of buildings in Karachi to be green by installing a co-generating plants, through which the building can produce its own energy. The MCB tower is one of his projects, that has installed a co-generation plant, and although it is the tallest building in Pakistan, but it is producing its own energy.

He said that a lot can be done to make Karachi’s architecture green, but everything cannot be done voluntarily; the Government must take part in it. Every country around the world is making endless efforts to make green buildings, in order to save their energy

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47. Interview with Ainulabidin; a consultant engineer for green buildings.
and resources and as a result to have a healthier environment to live in. There has been an ongoing effort in Pakistan also, to build a PGBC (Pakistan Green Building Council), that will take care of the laws and principles that needs to be applied in order to make a green building.

Mariam Hyder, who is an active member of IAP and has been IAP’s chairperson as well, said in an interview held by DAWN\textsuperscript{48}:

\textit{“Seminars and interactive talks amongst the fraternity are in progress to develop a manual customized to our climate, resources and social norms and to formalize the PGBC (Pakistan Green Building Council) through the World Green Building Council.”}

The IAP has hosted an ARCASIA\textsuperscript{49} regional conference in October 2010 and the theme of their conference was `/Go green`. Before the event, students were supposed to take part in a design competition to design a children’s resource center. It was a great experience; first to design it within our studios and then to know the different perspectives, of students from other countries, about green architecture.

A lot of lectures and presentations were held by architects from different countries of this region. This event had a positive impact in spreading the awareness of green building and sustainability both within the architectural fraternity and the student body.

\textsuperscript{48} Interview was held by DAWN news with Mariam Hyder; an active member of IAP and has been IAP’s chairperson.
\textsuperscript{49} ARCASIA, \textit{StudentJamboree on Green Architecture}, Lahore, 2010.
• **FUTURE OF KARACHI**

The upcoming 60 storey Bahria icon tower\(^{50}\) next to the mazar of Abdullah Shah Ghazi in Clifton shows the urge to have skyscrapers in the city. This structure will have a great impact on the buildings in its immediate context as well as on the whole city. Intentions behind it seem to be to have an iconic presence for the city it will definitely add up to our economy.

![Bahria icon Tower](http://www.skyscrapercity.com/showthread.php?t=760274&page=2)

Figure (xiv) Bahria icon Tower

Bahria icon is a project that has started from scratch in an area where there is land available, but what about those areas which are jam packed with buildings already, how we can deal with those buildings. As I have mentioned earlier about the Hearst tower, which uses the existing facade that has been there since 1928, as a skin for the new building. It helps to retain the old architecture, and adds up to the heritage of the city.

\(^{50}\)Bahria Icon, designed by ASA.

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Aldo Rossi talks about the layering of a city in his book *The Architecture of the City*, that how a layered city is always richer than a brand new one. If we look at Saddar, there are a lot of beautiful old buildings, where as some are falling in to pieces, we can just to keep their facades and construct a new building there; It will show the progression of a city over the period of time. There have been proposals like the Hearst Tower in Karachi, for example; Duarte Mansion in Saddar, in which the facade shall be retained and skyscraper is proposed to rise from behind it. This proposal has been designed by Ar. Habib Fida Ali.

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Thus architects, urban planners and historians need to sit together and develop a plan for the city that incorporates the old with the new; a plan that has the capacity to embrace the fascinating new skyscrapers that can give the city an iconic presence, other tall residential and official buildings that reduce and limit the horizontal sprawl of the city and smart use of technology that can add upon the already existing architecture, all this while being sustainable as well.
CONCLUSION

The above discussion on the urban morphology and evolution of Karachi has highlighted the need to build vertically. Increase in land prices, land shortage, influx of population from other cities, rapid urbanization all validates the need of multi story buildings.

The sprawling city of Karachi is going through a rapid increase in population. Not only that, the availability of jobs in different urban sectors is attracting large crowds of laborers to the city hub. These laborers usually settle on the suburban edge of the city, as it is much cheaper and there is a great likelihood of their jobs being closer to these areas, as the industrial areas also lie near the suburbs of Karachi.

Karachi, in recent times, is going through a major development phase. Owning land has become a luxury and construction combined with material cost has increased tremendously in these few years. Builders, designers and residents- are all aware of the issues of land congestion. And hence, are building vertical.

However vertical construction is a solution with its own set of problems. As one goes higher the consumption of resources and energy immensely increases. But there are various ways in which this issue has been resolved. The case studies mentioned above provide a few examples which one can learn from and apply to our context in order make vertical buildings a positive addition to the city.

The existence of parallel cities in the contemporary Karachi is a striking occurrence. A few decades back, in different parts of the world, cities occupied different spaces. But
now, one sees a changing trend whereby the latter have grown together into singular, but multi-faceted entities. Today, the city comprises of different social, as well as physical manifestations.

Recently Karachi is going through a major development phase. Builders, designers and residents are all aware of the issues of land congestion. And hence, are building vertical. Ownership of land has become a luxury, and construction combined with material costs, have increased tremendously in these last few years.

Going vertical is not only a solution, but a problem in its own right. As one goes higher the consumption of resources and energy immensely increases. But there are various ways in which this issue has been resolved, we can learn from these examples and apply to our context in order to make vertical buildings a positive addition to the city.

Karachi, along with other developing cities, especially the ones with a colonial past, has been influenced by architecture of the western world. But now is the time to try and understand the local language and build sensibly to cater to the future generations which will carry it forward. In this day and age it has become critical to understand new construction methods. To create a new city is far easier, than creating a responsible one. The challenging task is really to keep the existing city going, and to constantly renew and energize it. This requires a lot of imagination and will to convert the disadvantages of the city’s inherent program into assets.

This dissertation while accepting and verifying the need to build vertical has also highlighted the various social, psychological and economic impacts of building vertical; taking care to present the issue from both the sides thus highlighting the complexity of
this issue. Only the continuous effort and contribution of city leaders, administrators, planners and the citizens at large can help in doing so. For ultimately, their actions will establish the nature, as well as the future of the urban fabric of Karachi.
BIBLIOGRAPHY


