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Measuring the success of human settlements- The case of Islamabad

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Summary

Islamabad, a legacy of the post war urbanism, is the first planned city in Pakistan and one of the largest new towns designed in Asia in 1959 by a Greek Architect and Planner, Constantinos A. Doxiadis. The city is designed on the concept of the Dynapolis - city of the future, a research project also conceived by Doxiadis in 1958, which gives a framework for making models for city plans with capacity for adjustment that will be flexible enough to accommodate the changing needs of time. The technique allows for calculations and manipulations of variables at any given point in time to forecast future changes. The precision of the forecasts can also be fine-tuned with the addition of various variables. The city is designed on grid-iron plan, and is divided into five zones. The plan has a National Park area allowing emergence and organic growth. Even though there have been considerable arguments that cities cannot and should not be planned and the future cannot be forecasted, Islamabad has flourished as a planned city of the future since 1958 and is one of the most desirable cities in Pakistan to live in. Today fifty three years later, like other new towns of its time, it needs to expand and address the needs of the present day while remaining true to the original concept for the city of the future, the "Dynapolis".

The city is expanding towards the semi urban area of Islamabad which has urban villages that were deliberately accommodated by Doxiadis in the city plan to retain the cultural heritage of the area as well as for the maintenance of sustainable balance providing the area as a backup for the food needs of the city. The idea of Doxiadis of connecting the city directly to its surroundings, leaving no gap between the city and the villages which results in a constant fusion, as the city is planned for all, forms the reality for today's Islamabad (Mahsud, 2007). These urban villages have developed into towns and are in total visual contrast with the Doxiadis designed sectors found in the Islamabad urban area. The shifting or transforming spatial patterns in the context of Islamabad is hence studied in this research to understand the urban morphology and the forces that influence and determine the future urban patterns in the city of Islamabad.

Doxiadis' ideas from his theory founded in 1942, "The Science of Human Settlements" which is known as *Ekistics,* forms the basis of and is taken as a reference point to study the emergent settlements in the Islamabad urban area. The *five principles of Ekistics* according to Doxiadis, forms the basis of all human settlements and he states that they are actually an extension of man's biological characteristics and man has always shown obedience to these five principles since ancient times.

This research is qualitative and exploratory case study based on in-depth interviews of the planning experts form the Capital Development Authority and residents of G-6 (planned settlement) and Bhara Kahu (unplanned settlement), questionnaires, observations (personal and peoples) and photographic documentation. It assesses the settlements in Islamabad based on four of the principles of Ekistics, and analyses the settlement outcomes through the fifth principle to measure the success of the planned and unplanned human settlements. The comparative study of the planned and the unplanned is taken to identify the elements that define the success in human settlements. This success is however achieved when the needs of the people pertaining to settlements are fulfilled in the settlements and promote happiness, safety and satisfaction as explained by Doxiadis.

A comparative study used in parallel for the purpose is the CSIR guidelines for human settlement planning and design (2000) generated recently but bears high resemblance and similarity to the theory generated by Doxiadis in 1942. This study however provides a framework for settlement making and calls the successful settlements as the positively

performing settlements, and identifies six structural principles and four spatial principles essential for the creation of well performing human settlements.

The research findings revealed that the needs, security and satisfaction were all defined differently in both the planned and the unplanned settlement hence the success is defined differently. The planning of Islamabad by Doxiadis has been highly admired and experienced to be functional by the planning experts as well as the residents of the planned sectors of Islamabad in general. However the freedom of choice exercised by the residents of unplanned settlement has also proved to be functional for them and both settlements are found to be in accordance with the Doxiadis definition of successful human settlements.

Keywords

Human settlements, planned, unplanned,

Islamabad, Doxiadis, Dynapolis, Ekistics

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Foreword

The city is an expression and a replica of people's social and cultural development with respect to time. Cities are defined by the way of life of the citizens, their preferences and choices, attitudes and perceptions, traditions, beliefs and culture.

The region of South East Asia has a known history of planning with the grid- iron planned[1] cities of Harappa (Taxila) and Mohenjo-Daro dating from around 2600 BC from the ancient Indus Valley civilization, cities that we still admire.

Human settlements are a product (by the man- for the man) and a reflection of the human mind (Hillier, 2012). In order to understand the extent to which we need to plan requires a thorough understanding of the laws of nature and different sciences like biology, psychology, complexity, cognitive and social science, one does not only need to make links between the different disciplines but one needs to evolve a synthesis in space and time (Doxiadis, 1970). Since man is the centre of all debate in different roles and his creation the city is "actually an extension of his biological characteristics" (Doxiadis, 1970), based on this I have directed the research to finding that synthesis in space and time.

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[1] Grid-iron planning is a way of planning cities found from ancient times in which streets are planned at right angles to each other forming a grid.

Abbreviations

CDA	Capital Development Authority
CIT	Critical Incidence Technique
COF	City of Future
CSIR	The Council for Scientific and Industrial Research
ELS	Ekistics Logarithmic Scale
ICT	Islamabad Capital Territory
IHS	Institute for Housing and Urban Development Studies
KAP	Knowledge Attitude and Practice
MPC	Master Plan Cell
PIDE	Pakistan Institute of Development Economics
RoW	Right of way

Glossary of Terms

Baldiati nizaam	Metropolitan System
Bazaar	Market
Bhai Chara	Brotherhood
Biradari	Brotherhood. It comes from Persian word "baradar" which means brother. It is a strong system of social stratification, on basis of tribal affiliations and clan forming communities in Pakistan
Budh bazaar	Wednesday market
Chai khana	Tea house
Chak	Urban Village
Charpai	A traditional hand woven bed of wooden frame. *Char* "four" + *paya* "footed") used without a mattress.
Chowkidaar	Watchman
Dahi markaz-e sehat	Rural Health Centre
Dahi taraqiati markaz	Rural Development Centre
Dhabay	Roadside restaurant also called truck driver hotel as they are mostly located on highways and mostly serve for the truck drivers 24 hours a day with tea and local cuisine liked by the drivers. Usually dhabay are furnished with charpai and the traditional huqqah for the drivers to relax
Huqqah	A traditional social smoking instrument similar to sheesha.
Itwaar bazaar	Sunday market
Janazagah	Funeral ground for rituals of funeral
Jirga	Local jury system where elders and respected members of the tribe decide issues unanimously.
Kanal	Local unit of space equivalent to 4500 square feet
Khokay	Kiosks
Kucha Rasta	Unpaved / untreated pathway
Markaz	Centre (here used for the centre of the sector which is a major commercial zone and called markaz)
Marla	Local unit of space equal to 225 square feet
Masjid	Mosque. Place of worship for Muslims
Nala	Open drain/ storm water flow
Nazim	Mayor
Nazim	Elected leader of Union Council
Ramadan	Muslim Holy month of fasting
Saalsi	Local leaders who are highly respected and influential in the area and acting as judge for social problems non- criminal in nature
Sheesha	A flavoured tobacco water pipe similar to huqqah usually translucent colour glass
Wadera	Landlord, feudal lord

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Chapter 1 Introduction

1.1 Background

Cities evolve and grow and as time passes sometimes new cities are born and sometimes the pattern of growth of cites change. There is hardly any place where this is not an evident phenomenon. The population of the world is constantly growing and pushing the boundaries of the land and the skies to accommodate them.

There has been considerable debate on whether to plan or not to plan cities and let them emerge and take their own course. There have been considerable debates but the latest ideas somehow show the inability of spatial planning to deal with the issues of today and the alternatives come from the participatory or citizens' initiative which form the latest trends. Spatial planning has been criticized by several for its demerits and applauded in some cases by many for having its merits. Van Den Broeck, (2004) for example criticizes the traditional planning or 'master planning' for being quite inert, land-use-oriented and mainly impractical lacking calculation of limited resources, rapid change, time (change and uncertainty), having no regard for the values or interests of people and often having only theoretical grounds leading them far away from the realities, mostly referring to the garden city concepts and the ideal city of the CIAM that was led by the famous Le Corbusier. Master planning is a product of the twentieth century and realizing the differences from that time and now the contrast is that the governments could somehow plan by predicting a logical future and plans could be implemented in a technocratic way, which is unlike today where the situation and circumstances are very different. As a reaction to the long term planning the disbelief in planning gave rise to Lindblom's (1959) science of muddling through (Van den Broeck, 2004). Louis Albrechts (2004) criticizes the traditional land use planning mainly for the reasons of control through the zoning which he argues is rigid, uncompromising and not adhering to the changing conditions and needs.

Post war urbanism (1950s-1960s) however brought many new towns which were developed all over the world using traditional master planning, some of which still bear the testimony of the time when they were built and the philosophies, intentions and motivations of their makers (Malik, 2003). The ideas and trends flowed to the east and developing countries, some still in the age of infancy and recently out of trauma of war and celebrating the new independence like Pakistan, India and Bangladesh. The countries ambitiously and eagerly imported architects from the west to set up symbols of modernism and prosperity and hence new capitals for the countries were developed. In 1997 a critical comparative analysis of the three new capitals of Pakistan, India and Bangladesh was undertaken to evaluate the success or failure of the fundamental principles for the formation of the capitals in a two day international seminar organized by the Edge Hill University College and the Department of Civic Design at the University of Liverpool. The criticism received for the capitals of the south east Asian region cities was mostly that the imported expertise did not understand the regional and the cultural needs of the countries still in the age of infancy and unable to afford the luxury of building new expensive capitals. All three capitals (Islamabad, Chandigarh and Dhaka) were developed by foreign consultants to portray an exodus from the historic colonial

past and present as symbols of independent new cultural and national identity in an attempt to remove the shame of the label of backwardness and the lack of local experts to deal with complexity of such scale (Malik, 2003). Ayyub Malik (2003) questions the validity of representation of the urban planning and architecture of cities in the South Asian region required for a better future and the criteria that can be used to explore the validity and success of the same.

The new town of Islamabad, planned by Constantinos A. Doxiadis has been argued to be a different case. The city had all the noticeable places designed by international signature architects and planners in the 1960's (Malik, 2003). Apart from the criticisms that usually disagree with the master planning ideas, the city of Islamabad along with other cities designed by Doxiadis has over the years been highly commended. Doxiadis approach was unique; he took into account the factors of time (change and uncertainty), the changing needs, and the limited resources and addressed every argument against planning. What makes him different among the planners of his time was his ability to innovate and integrate all the knowledge from various disciplines and sciences to form the basis of one science of human settlements that he named Ekistics (Jagadisan and Fookes, 2009).

Ekistics (the science of human settlements), was developed from the studies of the ancient cities which were still highly admired and the evolution of human settlements. What became the base of the science was that man has always shown obedience to certain principles in developing his settlements, which are based on primarily the physical, social and psychological needs (Doxiadis, 1968) . The cities designed by Doxiadis, an accepted global architect and planner of high intellect, are in more than 40 countries, the research however focuses on the city of Islamabad, which has been commented as one of the best living examples of new towns designed and actually implemented as planned. (Bogdanou, Myrto Antonopoulou, 2003). The city was planned on and, on a grid- iron design and planned to be developed in phases. Although forecasting for planning cities is one of the greatest criticisms by writers (Van den Broeck, 2004) Myrto, Bogdanou (2003) highlights the successful use of the forecasts for the city of Islamabad, calling it as a striking example that has developed exactly as planned. However, Islamabad was originally planned as part of a large metropolitan area by integrating the city of Islamabad and Rawalpindi as twin cities which were highly dependent on each other for the overall urban development. The original master plan (figure 2) was however not materialized and the two cities developed side by side, Islamabad according to the Doxiadis grid and Rawalpindi an organic city. The cities today are called the twin cities of Islamabad and Rawalpindi are termed as physically integrated and institutionally disintegrated cities by Sajida M. Iqbal, (2006) who has explained the gaps and reasons for the failure of total implementation of the metropolitan area plan of Doxiadis in 1960.

Doxiadis' idea of urbanity for Islamabad was a dynamic linear growing city at the foot of the Margallah hills, and set aside the city of Rawalpindi, representing an ambitious and modern symbol of a progressive Islamic society, a symbol of national character and a leader among cites (Mahsud, 2007). The grid iron geometric layout plan is considered in accordance with the Islamic principles of design (Quaiyoom, 1997 in Malik Ayyub, 2003). The city of

Islamabad marking a new era of modernization has thrived through years and is a testimony of the fact that planning requires more wisdom (Hamdi, 2004)and a science (Doxiadis, 1968) than just theories and also proves the allegations against the master planning as not fully acceptable.

The fact that these new towns including Islamabad were built more than fifty years ago they all today face problems of growth and are looking for ways to handle the development to avoid disorder in the ordered cities. Like Chandigarh (in India) which was built around the same era as Islamabad in Pakistan in 1959 and has a regional similarity and purpose of development, Islamabad also faces similar challenges.

It is important to understand how the city has evolved and developed over a period of time, how has it shaped or affected the environment (social, physical, economic etc.) and the behavior of people and the potentials and externalities they have produced and which forces are responsible for the change.

The information required to deal with the urban problems is often lacking or not given due importance hence giving rise to chaotic or not strategically planned cities or ill-defined planning. It is important to document and assemble all data relevant to the city, in order to facilitate a well-defined planning strategy for the best possibilities of future of that area (Portugali, 2011).

Figure 1: The Concept of Dynapolis for Islamabad

Fig. 3. The main highways

Fig. 4. The three parts of the metropolitan area

Fig. 5. The central functions of Islamabad and Rawalpindi

DYNAPOLIS:
[Nuclear City Vs Linear City]
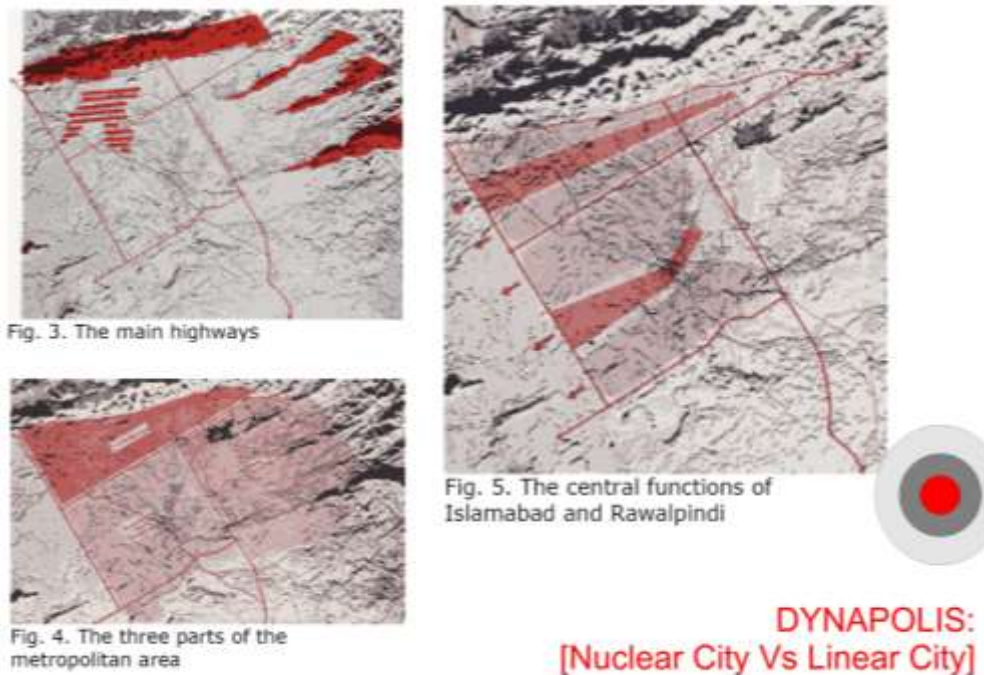
Source: CDA

1.2 Problem Statement

The metropolitan area was divided into three distinct areas Islamabad, Rawalpindi and the national park area to avoid intermingling of functions in the future (Doxiadis, 1960b) (see figure 2). The metropolitan plan did not materialize due to several factors and hence Rawalpindi is not in the scope of the research area. Islamabad and the national park area which fall under the Capital development Authority area are under consideration. Islamabad is the federal capital and one of the major cities of Pakistan facing problem due to rapid urbanization and urbanism. Although the planning of the city has been admired by practitioners and theorists, for having maintained the urban character as planned for the city, it is somehow gradually changing. David Derrick, (2008) in his blog "Islamabad and Doxiadis", has mentioned that the city of Islamabad was constructed on what now seems to be rather dated ideas of the world city or Ecumenopolis. The city planning and Doxiadis 'approach has been much admired and mentioned by Toynbee in his travelogues who after witnessing the change in the condition of Karachi and visiting the new capital Islamabad and meeting Doxiadis credits him for being his third formal Greek education. The initial plan that was laid out by Doxiadis in 1959 on the concept of "Dynapolis", the city of the future, a research project which was conceived in 1958 and launched in 1960 (Bogdanou, 2003).(figure 1- the concept is explained in section 1.7 the description of the research area). The city of Islamabad however could be differentiated from a linear city in terms of absence of size, dynamic in nature and unidirectional growth (Doxiadis, 1968). This idea has been commended by Stephenson (1970) and Botka (1995) for long term benefit of the city as it allows for city development according to the need and requirement. (Maria and Imran, 2006,) The Master plan is being gradually amended as "new forces" (which Doxiadis explained as the needs pertaining to the human settlements that affect the settlement form, which can be technological change or any advancement, population growth etc.)(Doxiadis, 1970) and time has changed the patterns of spatial development. The city has a regular finite pattern and is defined by sector grids of 2 X 2 km in the developed zone 1. This is in accordance with the original master plan (figure 2) by Doxiadis, which used the grid of this 2 X 2 km as an optimum size forming a sector to deal with the problems and use the repetition of the same sized block to expand the city further as and when required.

This however has been criticized by various writers like Pott (1964) who hoped it would only be a graphical representation and Mier (1985) who criticized the hierarchical design for its rigidity. Botka (1995) has admired the wide right of way (ROW) and has labeled it as a strong identifying feature of Islamabad which is very suitable for a futuristic approach and to be used as future utility corridors. The city however is claimed not to have achieved the automobile per capita as planned. Taylor (1967) has also criticized the straight roads and single story houses for monotonous and costly movements (Maria and Imran, 2006,). However the under developed sectors of zone II are still following somewhat the grid pattern but these are gradually changing. The major problem of the changed patterns is observed in zone IV of Islamabad which is the largest of all zones and was initially intended to provide backup for the city, with small urban villages and farms. Doxiadis admired the cultural and natural landscape of Islamabad with these existing small settlements and Margallah hills

providing a beautiful backdrop to the city. He preserved the local vernacular tradition of architecture along with the natural heritage (Mahsud, 2007) and the villages remained as part of the Islamabad rural and the Margallah hills as part of the greens (zone III).

Figure 2: The Original Master plan Of Islamabad

Source: CDA

The city of Islamabad is going through the same problems as the cities of the world created around the same period known as the Post war urbanism era around 1960s. The city's population has expanded many folds in half a century. The rapid urbanization, limited and unaffordable housing options within the developed sectors in zone I and availability of housing options outside the jurisdictions of Islamabad gave the citizens reasons for moving out of the city to privately developed housing societies. Fifty three years after the creation of the city the consultant firm Doxiadis Associates, the original planners of the city was called again for further conducting a revision in the Master plan. However nothing has materialized out of this intention and the Capital Development Authority, responsible for the development of Islamabad, has taken up the matter to the cabinet for the revision of the zoning plan which has been approved by the cabinet division. However the zone IV has irregular, organic developments which have problems of litigation, infrastructure and services, and the rural urban divide that the authority is trying to deal with in order to expand the city of Islamabad somewhat on the patterns of initial master plan. The zone has been further divided into sub-zones A, B, C, D to control the phased development that is to follow (figure 5). The existing land use plans have been revised in these sub zones to integrate the new development (Table 3).

The land use zoning revision in the zone IV has reasons to accommodate the growing population as well as the needs of the citizens of Islamabad whereas at the same time will bring out externalities that may change the outcomes in the larger context of the Dynapolis. The question here arises how can the contrasting patterns of planned and unplanned be fitted together to produce a harmony in the spatial structure and eventually produce successful human settlements as defined by the architect of the city of Islamabad? What future lies ahead for the city of future?

1.3 Research Objectives

From the above mentioned problem statement the research aims to investigate the different spatial structures (planned and unplanned) within Islamabad Capital Territory, their evolution and development through time, to understand their dynamics.

It also investigates the theories, philosophies and influences behind spatial design, their appropriateness (in terms of functionality) according to the location, concept, values and time validity. It is important that theories which relate to the spatial designs must be timeless because if they are time bound they will not work in isolation after the expiration of the validity period. Hence they need to be adaptable and adjustable according to the changing needs of time.

The study also aims to look at the problems and issues arising from certain patterns of cities, and the successes and potentials of the same.

Objective

The objective of the research focuses on the understanding of the urban morphology and the forces that change the patterns in the city of Islamabad to subsequently **measure the success of human settlements in time** and to assess **whether we are closer to the sort of knowledge integration that Doxiadis has advocated.**

1.4 Research Questions

This success is achieved when human needs pertaining to the human settlements are satisfied as defined by Doxiadis. The ideas of the planned and the unplanned human settlements brought up the following Research question and sub questions which lead to further literature review:

Main Question

What factors determine the success of human settlement patterns in the context of the Dynapolis- the city of future- of Islamabad?

The subsequent sub- questions are:

- How have the physical, social, economic and political processes and events influenced the formation and transformation of the planned and unplanned settlements of Islamabad in time?

- How do the principles of Ekistics help in evaluating the formation and transformation of patterns in the planned and the unplanned settlements in time?

- Which are the outcomes that are identifiable in the human settlements under consideration?

- Which are the different elements that derive from the analysis that explain the success factors for both plan and unplanned settlements and how do they score against each other when compared?

1.5 Significance of the Study

The study is an essential step towards understanding the planned and the unplanned human settlements, the patterns they have followed and the needs of people which provide a starting point to understanding how to create a balance between man and the man-made environment and produce successful human settlements. The case study helps in understanding the capacity of the Master plan of Islamabad to deal with the needs, problems and issues pertaining to the human settlements in time.

1.6 Scope and Limitations

The study covers both psychological and sociologic aspects of spatial planning. An environment shape behavior and vice versa has empirical evidence in behavioral psychology. The dynamics of spatial structure of cities remains as the main aspect and base for the research to understand its contribution to the process of management and development. For that matter two types of spatial structures are researched upon i.e. planned (i.e. according to Doxiadis design) and unplanned (i.e. not Doxiadis designed and mostly emergent in nature). This eventually will lead to ascertain the relationship between spatial planning theory and practice and the extent to which it does or not. However, a correlation may not necessarily mean causation.

The main aspect of spatial structure (built and natural environment) is looked upon from the growth patterns and functionality of the human settlements. The research also looks into the theories and philosophies behind the spatial planning, their appropriateness according to the location, concept, values and impetus behind the development of the new settlements. Further research can work on identifying the psychological and sociologic effects of the spatial structures, the externalities they produce, the problems, issues and the limitations.

However the study only provides a base for policy makers and urban managers and may provide a base for further deeper study on the cognition and complexity issues and on developing visions for the areas under consideration. The limitations of the research are due to time insufficiency to cover the subject in detail and due to the fact that the layout for research area has not been covered in Islamabad plans (secondary data availability problem) and only satellite images and observations have been used to identify the physical patterns.

1.7 Description of the research area

The case study is conducted in the federal capital Islamabad, the only planned city of Pakistan. The city was designed on the concept of Dynapolis- 'City of the future' (figure 1) and is one of the largest planned capital cities of Asia of the twentieth century. Doxiadis´ imagined it as a theoretical project of urbanism and it was financed through Ford Foundation for evolving an operational and design structure for an optimal urban settlement through using the opportunity created by the new capital project. Ahmed Zaib K. (2009), argues that Islamabad, besides representing the best illustration of his legacy, gives a view on the course of 1950s-60s urbanism, specifically, embedded in its making is the transformation of modernist ideas about the city and the development of the discourse of human settlements (Mahsud, 2009).

Islamabad has been argued to be a city planned for the future and built for today by J. M. Frantzeskakis, one of the team members of the initial builders of Islamabad. The city which is planned for long term is characterized by hierarchical planning for residential, commercial and also the movement systems (Frantzeskakis, n.d.)

The concept of Dynapolis for the city of Islamabad:

The City of the Future (COF) was the first Research Project launched by Constantinos A. Doxiadis in 1960. The idea for a research on the future of cities was already conceived as early as 1958. (Bogdanou, 2003) (The detail of the City of Future concept is covered in detail in the chapter 2, literature review).

The city of Islamabad which was conceived in 1959 by a Greek architect and planner Dr. C. A. Doxiadis on principles of Ekistics (the science of human settlements, which is a project of the city of future) (Doxiadis, 1970) to serve as the federal capital of the country, covers an area of 906 square kilometers has a population of 1.8 million and density of 1271/ sq.km. The Islamabad capital territory is divided into eight (8) basic zones: administrative, diplomatic enclave, residential, educational, industrial, commercial, rural and green areas. It is the seat of the government and center of all diplomatic activity.

The city of Islamabad was divided into **five major zones**: Zone I, Zone II, Zone III, Zone IV, and Zone V (Figure 4 & 5) and land uses were defined for these zones for easy management and development of the city and at the same time providing the back up for the city for water, food and other resources. The city was to function as an ecosystem while maintaining the order in growth and managing the needs of the growing city. The city was thus also to function as a sustainable city though the idea and the term was not popular when the city was planned.

1.7.1 Brief history of formation of the planned and unplanned human settlements in Islamabad

The review of the original master plan and program by Doxiadis associates (1960), the subsequent revisions of the master plan and reviews are briefly discussed in this section which has relevance to the study area.

Early development phase of Islamabad in 1960 showed some existing clusters of settlements that were deliberately accommodated by Doxiadis in the new capital development (Figure 3). The settlements were predominantly villages which were left to grow organically without any grid framing around them. It was suggested that with the passage of time and based on the needs, land could be acquired for development and the villages to be preserved as model villages. This led to the growth of the organic settlements which form the urban villages throughout Islamabad today especially in the zone III and IV. One such settlement under consideration is the unplanned human settlement of Bhara Kahu.

Figure 3: Settlements existing at early development phase of Islamabad 1960

Source: CDA

The sector G-6 is the one of the first residential sectors planned and developed in the 1960 in Islamabad. This sector comprising mostly middle and low income groups was planned on basis of self-contained human community catering for all socio-economic needs. All the residential sectors or communities class V consists of four communities (Class IV) called sub-sectors. The population of residential sectors varies in size, depending upon the income group involved, the average being of order of twenty to forty thousand inhabitants. For each sector the centre which remains equidistant from all parts of the sector is planned as a principal civic and commercial centre with facilities like shops, stores, medical and health care and facilities, local offices, banks, mosque, cinema etc. (CDA, Master Plan Cell-Planning Wing, 1987)p.62. Similarly at the core of each subsector or neighbourhood (community Class III) are also collective facilities like primary school, group of eight small shops for every day needs, a small tea house and a mosque with small open space for public. The hierarchical design excludes the through vehicular traffic as far as possible in the neighbourhoods which facilitates the pedestrian traffic to schools and the shopping areas.

Major government studies, programs and plans for the area since 1960

Various studies mentioned below were undertaken since 1960 and efforts made by the government for Islamabad that altered the patterns in different parts of the city.

- Master plan 1960- DOX-PA 88

- Dorsch/Gollwitzer Regional Planning Study of 1973 (the German Study)

- CDA Study of Islamabad region- a general strategy for development undertaken by K.A. Hassan 1971

- Panel of Architects &Planners- Report on the Review of Master Plan, 1975

- Review of Islamabad Master Plan 1987

- Revision Master plan 1991

- Review Master plan revision 1991

- Revision Master Plan Zone IV land use and urban regeneration 2005

These time to time revisions were reviewed by the Master planning cell of the CDA and Doxiadis associates and reports were published. However, the master plan Zone IV and urban regeneration project which had major lands use revision of zone IV made by the CDA in the year 2005 got final approval from the cabinet in the year 2008 without any review by the original planning consultants who were invited for the award of work on the basis of being the original planners of the area. However the correspondence went too far but the change of government and hence the administration left the project unfinished and in the hands of CDA alone.

Figure 4: Master Plan Islamabad 1991

Source: Capital Development Authority, Islamabad
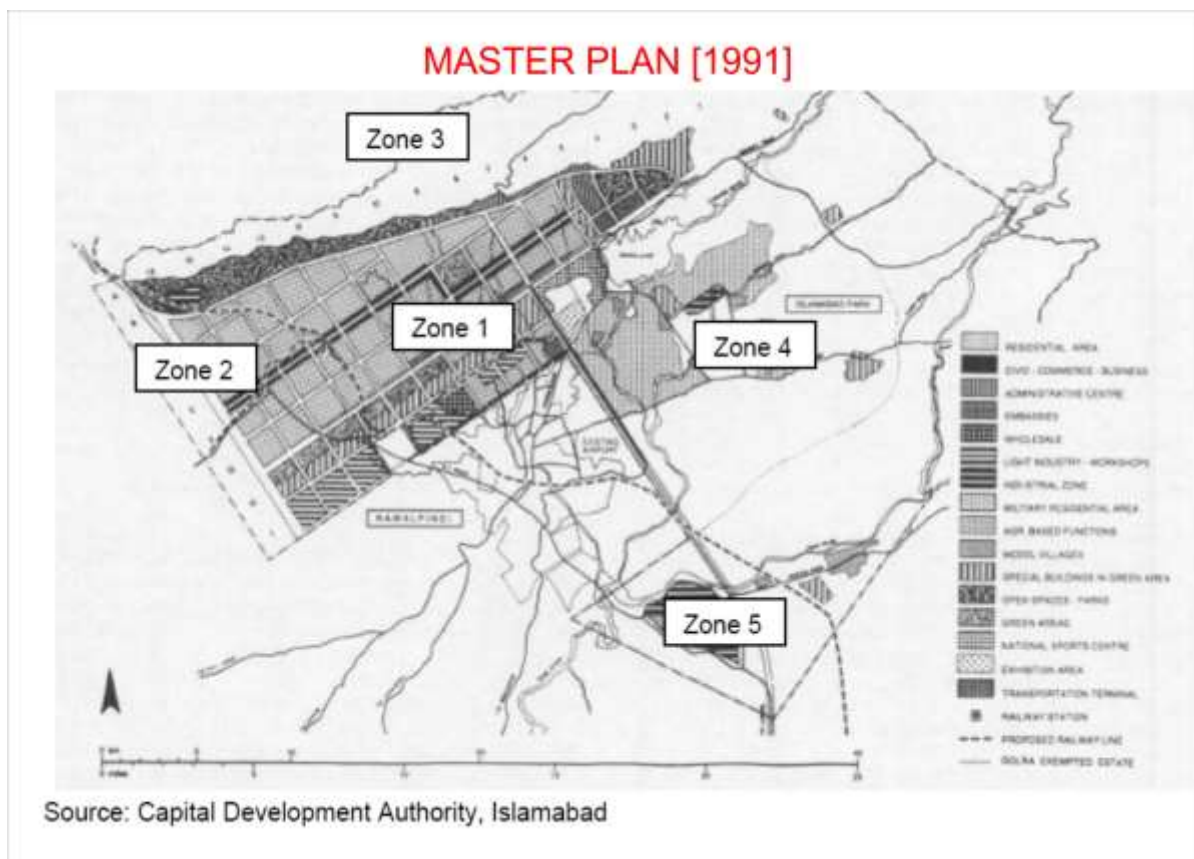
Source: CDA

Islamabad Zones:

Zone I consists mainly of all the developed residential sectors while Zone II consists of the under-developed residential sectors. Each residential sector is identified by a letter of the alphabet and a number, and covers an area of approximately 2 km × 2 km (1 1/4 mi × 1 1/4

mi). The sectors are lettered from A to I, and each sector is divided into four numbered sub-sectors. Zone III consist primarily the green zone with the Margallah Hills and Margallah Hills National Park. Zone IV and V consist of Islamabad Park, and rural areas of the city.

Figure 5: Master Plan with Zones of Islamabad Present Day
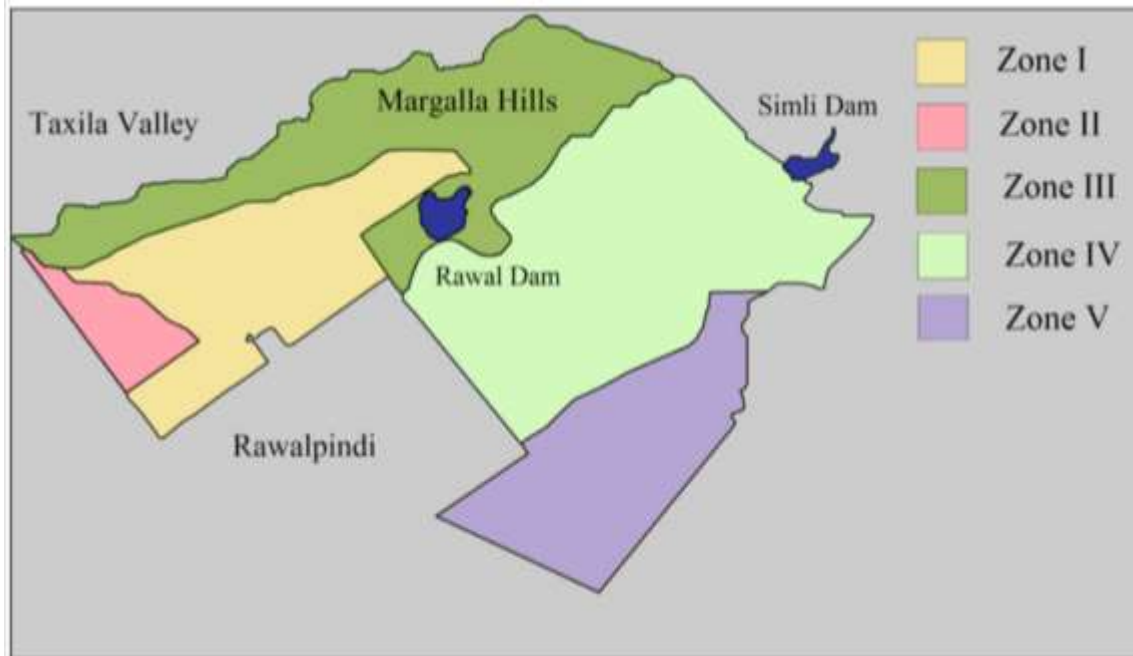
Source: CDA

The zones according to the area allotted have been shown in table 1. The zone IV is the largest and zone I which is fully developed zone is the second largest. The zone III, the third largest is primarily the green zone with recreational areas some of which are being considered to be maintained as the model villages. The small urban villages form a part of the city's reality to be maintained and retained as part of the city's cultural heritage.

Table 1: Summary of area of zones

ZONE	ACRES	KILOMETER(square)
I	54,958.25	222.4081
II	9,804.92	39.6791
III	50,393.01	203.9333
IV	69,814.35	282.5287
V	39,029.45	157.9466

Source: CDA

The Islamabad area distribution was planned such that though at that time the terms green city and sustainable development was not popular as it is now but it was designed as a green city with half of the area as Islamabad Park.

Table 2 below shows the distribution with the park and urban areas equal and the rural area given a double area.

Table 2: Islamabad area distribution

Total Area	906.50 sq. km
Islamabad Urban Area	220.15 sq. km
Islamabad Rural Area	466.20 sq. km
Islamabad Park	220.15 sq. km

Source: CDA

Figure 6: Sub Zones for Zone IV of Islamabad
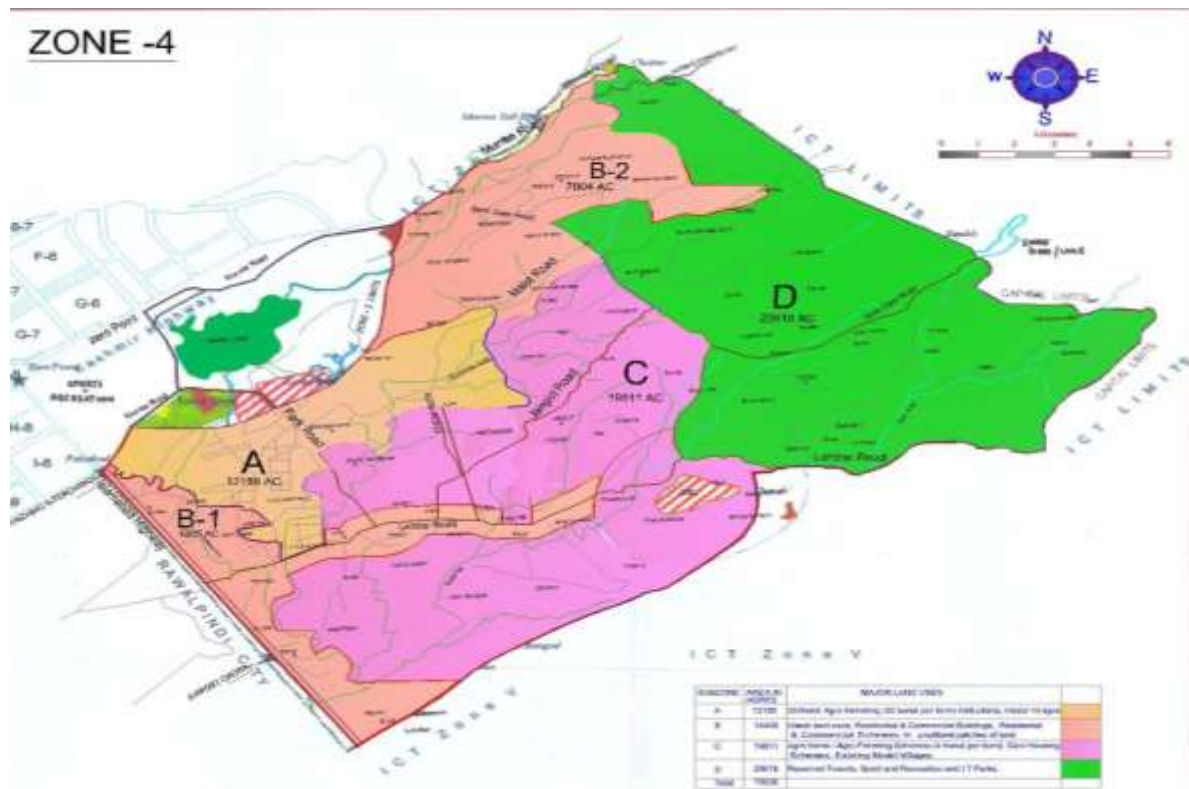
Source: CDA

The zone IV of Islamabad has however been sub divided in sub zones A, B, C and D. this zone that basically covered the Islamabad rural area was also intended to serve as back up for Islamabad. The area provided the supply from the agro farms and water resource. The land uses for this area sub zones have been revised. Figure 6 shows the sub divisions and Table 3 gives the existing and revised land uses for the sub zones of zone IV.

Table 3: Islamabad zone IV sub divisions- Land use revision

ZONE IV SUB DIVISIONS	Existing Land Use	Proposed Land use
SUB ZONE-A (12, 941 acres)	P&V Schemes Orchard Schemes Institutions (NIH, NARC) Model Villages (*Chak* Shahzad, Tarlai Kalan) Sanitary Landfill Site	Agro farming/ Orchard Schemes (Min. 20 Kanals) Institutions (G+3) Model Villages Public Housing Schemes. [Row housing, apartments]
SUB ZONE-B (12,941 acres)	Residential (Sohan, Khanna, Gangal, Koral Bhara Kahu, Phulgraan) Commercial	Residential housing (Public & Private); Row Housing Apartments Commercial Institutions Village up gradation
SUB ZONE-C (21, 279 acres)	Commercial Residential (Chatha Bakhtawar, Jagiot, Mohriaan, Alipur, Partal, Malot, Kirpa, Thanda Pani) Brick Kilns PINSTECH	Agro farming/ Country Housing /Orchard Schemes (Min. 4 Kanals) Institutions IT Parks Housing Schemes (Public/Private) Village Up gradation Exhibition grounds
SUB ZONE-D (22, 860 acres)	Forests, Simly Dam, Villages Tumair, Pihont	Agro farming/ Orchard Schemes (Min: 20 K) Reserved Forests Institutions Sports and Recreation Entertainment Zones IT Parks Golf Courses, Polo Ground, Country Club Water Sports, Swimming pools Gliding & jogging tracks Exhibition grounds Model Villages

Source: Developed by the author on information from CDA

This revision has been approved by the cabinet division. However, CDA has tried to maintain the backup system from this previously Islamabad rural to Islamabad urban area and have proposed to convert the urban villages into model villages.
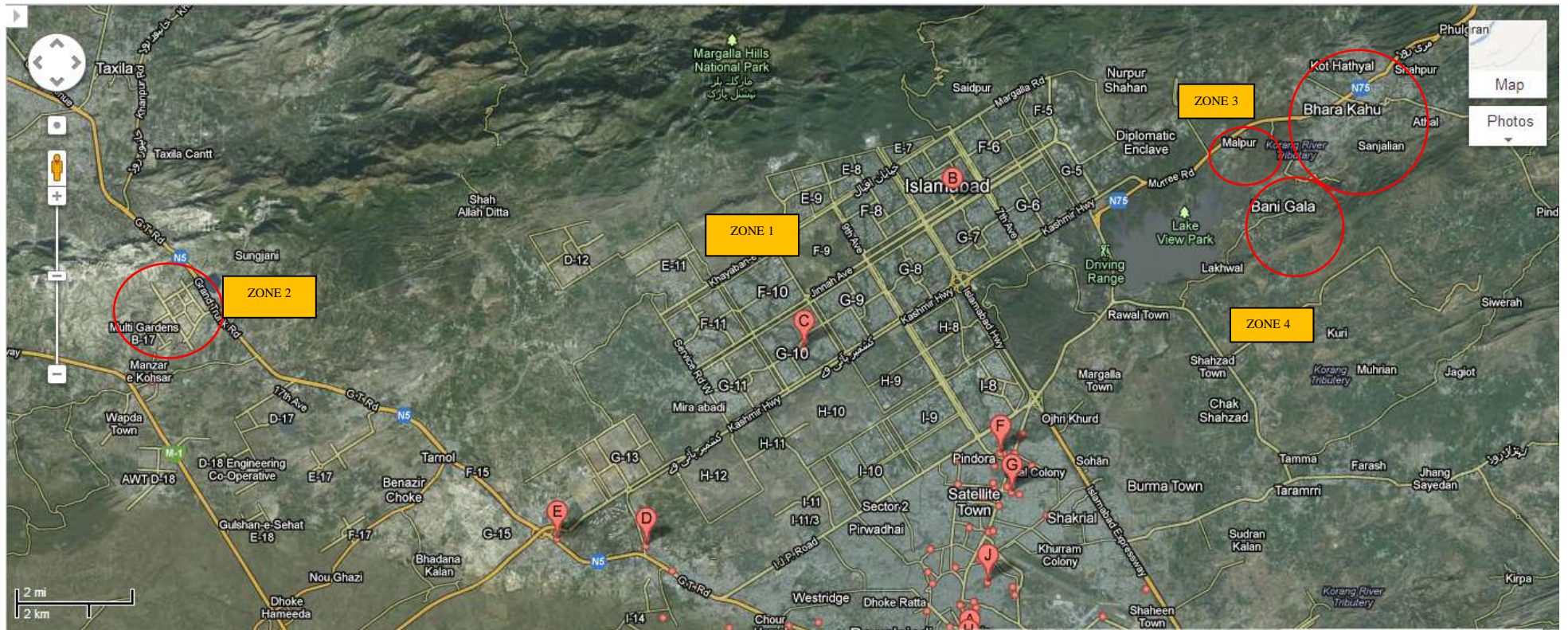
Figure 7: Islamabad satellite image of zones and for identification of unplanned human settlement

Source: Google Maps

The research requires study of an unplanned area which is in total contrast with the Doxiadis grid iron planned sectors of human settlements. For this purpose the three potential areas looked from a satellite image appeared from zones II, III and IV. Figure 7 shows the circled areas which form the potential study area for the unplanned category which do not have a grid iron plan.

Zone III and IV was categorized by Doxiadis as the national park or the semi urban area of Islamabad, and was excluded for the capital development site. However, The area having a variety of landscape features, the Rawal Lake and the rivers Simly, Korang and Soan was been highly admired for the great potentials as national park site (Doxiadis, 1960b).

Zone IV was planned for having educational institutions, the national university, the national stadium, the academy of medical sciences, the atomic research institute and all other institutes related to culture, research or national development. The agricultural areas were also included in the national park area (Doxiadis, 1960b).

Taking a closer look on the area shows settlements without grid that are in sharp contrast with the zone I, which has developed sectors in accordance with Doxiadis plan. This area is characterised by a complex assembly of different components of emergent settlements which are densely populated and have a terrain and topography that is very undulating.

The first instance of looking at the maps gives the chaos and disorderly impression of the area. These urban villages have grown and consolidated over a long period of time (some from even before the formation of Islamabad.

The Bhara Kahu (figure 8) which falls in the sub zone B2 of zone IV of Islamabad, however is one of the most densely populated out of all four potential study areas initially marked and is selected for the case study of unplanned human settlement. The area includes residential colonies of certain organizations like the Pakistan Television, apart from other residential areas. This area is also characterized by the feudal or the Biradari system.

Figure 8: Zoomed in view of Bhara Kahu- Zone IV with the Korang River

Source: Google Earth

1.8 Thesis structure

The thesis is structures in five broad sections. The first section covers the introduction to the research, the problem statement, the objectives of the research, the research questions that help the objective of the research, the significance of the study and the scope and limitations.

The second part of the report covers the literature reviewed to understand the phenomena under study and what is already known in the field of planning of human settlements and what is being explored and debated. In the end a theoretical framework is provided.

The third is related to the research methodology that is adopted to operationalize the concepts into variables and identify indicators. The section covers the sample selection and data collection and analysis methods and techniques. The fourth section is the findings and analysis from the field work. The fifth and final section covers conclusions, lessons learnt and recommendations for further research.

Chapter 2 Theoretical framework

2.1 Introduction

In order to see the development phenomenon of cities, the review starts with the different perceptions of the cities by researchers whose ideas further lead the study. It also relates to how the human mind perceives the cities and how it leads to the understanding of the issues our cities face today and hence their solutions out of this mental construct. The cities are said to be a product of the human mind (Hillier, 2012) and hence they will be an image of what values are given importance by the planner or the decision makers. The ideas of researchers have been seen from the perspective of the latest trends of the twenty first century and the science of human settlements derived from the ancient times and synthesised with the sciences known today.

2.1.1 Cities- Perceptions, images and metaphors

Portugali (2011) explains cities as "huge **artefacts** ever produced by human", and associates the planning to be unique characteristic capability of humans alone. This shows the creative dimension of the human and the city as a product of his creativity.

Marshall (2009, p.1) starts the introduction in his book "Cities design and evolution" by saying "cities are ultimate human-made habitats, and yet- among all species- it is perhaps only human who create habitats that are not fit to live in". He argues cities cannot be seen as buildings which are more like work of art or as organisms. They are more like an ecosystem composed of multiple elements that are coevolving.

Doxiadis says we cannot call cities bodies or see them as organisms and calls cities as biological individuals of higher order (due to their highly complex nature) that need development of all kinds; social, economic, physical and so on. He acknowledges the multi-dimensional nature of the subject and says it is difficult to give it a complete picture and a problem how to present it.

2.1.2 Cities- To plan or not to plan debate

There has been an ever favorite debate on the topic, *to plan or not to plan*. This topic has been explored by sociologists, psychologists, environmentalist apart from the built environment professionals and academicians.

Cities are being increasingly planned and there are numerous cases of planning failures and several reasons given by different authors like planners' perception, knowledge, priorities (Roy, 2009), lack of wisdom, skill and competences (Hamdi, 2004), lack of capacity of the planning institutions and disparity between actuality and need (Turner, 1992) while some argue there is no way in which large cities can be planned in detail (Turner, 1992) and prefer a need to allow spontaneous and incremental development (Hamdi, 2004, Turner, 1992). Alan Turner (1992) in his article "Urban planning in the developing world: lessons from

experience", mentions cases where practices on account of certain bad planning resulting in failures has misguided and caused rejection of all planning.

There has been a long debate and questions regarding whether typically planned (Portugali, 2011) (Marshall, 2009) or unplanned sometimes referred to as organic (Portugali, 2011), spontaneous or emergent, (Hamdi, 2004) spatial developments are the answer to the dilemma of urban development and management and the growing **complexity** that urban areas are facing today with the growing population and pushing boundaries. It intends to inquire what constitutes spatiality. Spatiality takes different directions as it is a product of ways in which different things, people and activities are brought together or kept apart (Mooney, Pile, et al., 1999). The study looks at other arguments that deal with the human factor with his capabilities, capacity or instincts or to say human behaviour that governs the patterns of spatial development (Hillier, 2012). The urban development is composed of the process, approach and outcome. The debate is, *what is the right approach to development? What kind of spatiality is produced and what are the outcomes?*

The very existence of the possibility of a science of human settlements is evident by the cities from ancient times that we admire even today (Doxiadis, 1970). The existence of cities is taken as an indication of the existence of planning (Portugali, 2011) and it is hence common to make a distinction between planned and unplanned or organic cities (Portugali, 2011). The third view, however, is of the possibility of a co-existence as Hamdi Nabeel, (2004) in his article, *Small Change*, highlights the importance of both, structures designed and those that are enabled to emerge and calls for finding a balance between both. His claim is that human organizations always contain both structures and says that planning must stay within self-imposed limits. This leads to the question, *to what extent should cities and towns be planned* (Marshall, 2009).

To begin with the answer of right or wrong, several texts suggest that there is no one way or right way. Portugali, (1997, p.376) provides an answer, which is self- organization and terms it as the 21st century "image" and "cognitive map**"** with which we closed the doors of the 20th century. According to him, limitations of human capacity and capability to plan ahead involve a lot of complexity and this argument leads to the concept of self-organization (Portugali, 2011). *But how can self-organize patterns be used as an alternative to master planning?* (Marshall, 2011)

However, the study of human behaviour and instincts, the natural and social science relation to theory, which led to the development of the theory of ekistics by Doxiadis and applied in urban planning particularly in the context of Islamabad, in 1958 also, forms an important building block of this research. The principles of ekistics which take into account all the sciences, (discussed in detail in later text) form a secondary hypothesis for the study. It is assumed that if the principles of Ekistics are the answer to spatial development as they are based on the biological characteristics of humans, they should form the basis of all the spatial developments whether typically planned or unplanned. These principles are assumed to be timeless because the biological characteristics do not change unlike the society's cultural and social values, the meanings and the actions (Allmendinger, 2009) which keep changing with context and time and hence require the separating of theory from society as it cannot be tested

anymore (Allmendinger, 2009). As it is related to human instinct it is presumed to follow in all the forms of development by the human initiatives though it may differ in organization and order, which will have many probabilities and hence spatiality arising that takes different forms and directions. (Mooney, Pile, et al., 1999)

The arguments arrive at a solution that is evolved out of the sociological, biological and psychological dimensions.

2.1.3 Cities- Arguments in favour and against planning

Marshal, (2011) builds an argument on the statement against the creative production that "*a new modern planned and purpose-built city is not necessarily more attractive, functional or successful than the other one*" and favors the traditionally unplanned environments and organic urbanism as compared to the modern planned urban environments that are often perceived to be worse as they are anti-humanistic with *"alienating environments, with ugly, brutal concrete jungles, landscapes of barren tarmac, looming slab blocks and gloomy undercrofts*" (Marshall, 2009).

Believing in the evolution and organic growth of cities, Marshall (2011, p.) says "*Cities have evolved from things that were not cities, and cities will evolve in things this are not cities too*". He uses the example of beehives to link the evolution and instincts arguments saying, *"one should take a good look at the principles that work in nature, for instance in beehives. There's no master planner bee, but the bees will instantly create one or more centers in the hive themselves. Not because they have to, but because it's the product of the individual instincts of all bees involved"* (Marshall, 2011). It is this individual instincts argument that we will use contrary to Marshall's anti planning argument using the same pretext but for planning consideration taken by the Ekistics.

The other argument goes in favor of planning as, *"There is a need for a science dealing with human settlements, because otherwise we cannot view these settlements in a reasonable way"* (Doxiadis, 1970).

This brings us to the argument of the features of heterogeneity and homogeneity of cities being the result of the ways of mixing and meeting of people and activities (Mooney, Pile, et al., 1999) which principles of ekistics define through human behaviour argument, *"that man, in creating his settlements, obeys general principles and laws whose validity can be demonstrated. These principles and laws are actually an extension of man's biological characteristics, and in this respect we are dealing with a biology of larger systems"* (Doxiadis, 1970). This eventually led to the claim that urban plans can be consciously and rationally produced and socially ordered (Mooney, Pile, et al., 1999). However, complications follow with variety of perceptions and derivations of order and may even be in clash with each other or with the existing spatial patterns (Mooney, Pile, et al., 1999).

The admiration of great ancient cities has been evident when writers and researcher start with the evolution and history of formation of cities. Portugali's statement of the cities' existence as proof of existence of planning, and terming the cities as "artifacts", admitting the creative abilities of humans and associating this quality only to humans(Portugali, 2011, Portugali,

1997) depict the potential in humans for the planning. Since it is the humans who can do cognitive planning and at the same time has limitations which according to him brought crisis of planning and requires "complexity- cognitive approach to planning" (Portugali, 2011). This is because the city dynamics are a product of and are affected by the behavior of humans as cognitive planners, so cognitive science is important in consideration of the complexity theories of the cities and urban models (Portugali, 2011). Yet at the same time the popularity of the self-organizing concept that emerged out of the complexity science, termed as an "image" and the limitations of the humans due to this complexity, that he sees the crucial problems associated with planning.

The land use planning has been mainly rejected because of lack of flexibility to the changing needs and time, limitations of the humans to forecast the future and the impossibility of total conquering of urban development (Van den Broeck, 2004, Albrechts, 2004). As a result and in reaction different ideas ranging from Lindblom's science of muddling through and self-organization have emerged.

The planning of cities is much more criticized as functions appear to be fitted in perfect geometric forms making them rigid and the geometry does not actually satisfying the human values. Since the beginning the forms of the cities have fluctuated between the geometric ideas and the organic (Hillier, 2012). Cities cannot be designed in geometry or seen in geometric forms and encasings like a house or buildings (Marshall, 2009, Lynch, 1981). A list of objections placed in this regard by Kevin Lynch (1981), says cities cannot be designed and insists that they should not be designed, as city form is sophisticated and complex like the structure of human values and the city does not play a noteworthy role in the contentment of human values which in turn are connected to the relation with the people. He comments on the human limitation of capability to understand the city, its mechanisms and all the complexity and how to change it. The city designs rather forms and the physical patterns that may work in one culture and may even produce predictable effects may not be generalized to other cultures. However the association of inclination of settlement forms has been apparent (Lynch, 1981).

Marshall, (2011) argues that instead of planning rigid and finite forms for the cities, energies should be focused to rather planning forms of intervention that permit the creation of urban order through distinct constituents and their relationships (Marshall, 2011, Marshall,). (Marshall, 2011)

Marshall's explanation brings us to the reactive evolution of self-organization due to multiple failures of the strategic spatial planning with reasons largely associated to the government controlled processes, government's lack of adaptability to citizens initiatives and meagre or no chances of civil society's subtleties and interests (Boonstra and Boelens, 2011). So here one criticism can be the reactive nature of the emergence of self-organization.

The other argument goes in favor of planning as, *"There is a need for a science dealing with human settlements, because otherwise we cannot view these settlements in a reasonable way"*. (Doxiadis, 1970)

Doxiadis (1970, p.8) argues the quality of the cities in terms of a system of movement has decreased because of the increasing complexity which we have not been able to handle and reduce like the primitive man managed to do so by simply introducing a high degree of simplicity.(Doxiadis, 1970)

Hence it is important to understand the basic science that underlies this field so as to produce cities that can be admired in the future like we have admired the cities of the past.

2.1.4 Cities- The middle path of co-existence

Nabeel Hamdi's (2004) arguments are the strongest and most convincing in the case of co-existence. According to him we need a middle path which allows for the development as well as emergent structures side by side. He insists on the need to understand the natural scales and limits and the need to think much larger, more strategic and find a balance between both the planned and the emergent. The importance of the fourth dimension and spontaneity with the incremental building is as much as the understanding of the systems, networks, people, places, politics and resources (Hamdi, 2004). This can be seen in the case of Islamabad too as the planned and the emergent have co-existed and Doxiadis deliberately had accommodated the emergent in the master plan.

2.2 State of the Art of the Theories/Concepts of the Study

From the above explanation of all the claims and ideas about the planning and against planning of the cities that literature review and the context of my study provided me with I explore the spatiality and the study hence deals with the concepts of complexity theory, cognitive science, emergence, city dynamics, urban morphology and the concept of Dynapolis- city of future and its planning theory in particular the Ekistics theory.

These concepts and the explanation of these claims as well as the evidence that supports the explanations or shows that the claim is not true are discussed in detail for each concept.

2.2.1 Urban Emergence and organic cities

The emergence is a concept that comes from the co-evolution, one of the three key features of the complexity theory (non- linearity, co-evolution and self-organization), which highlights the influences of systems and sub systems on each other. Urban emergence is favoured by many who reject the ideas of finite master planning. The argument here is that cities are growing, moving and altering as a result of the movement and activities of people as individuals and collectively (Doxiadis, 1968, Portugali, 2011, Marshall, 2009).

2.2.2 Dynapolis- The city of the future (COF)

Background

Myrto Antonopoulou-Bogdanon, (2003), who joined the COF in the very early time of his career as a member of the research team and became the third project manager in 1965, highly admires the project and calls it an invaluable idea conceived as a research project in 1958 by Greek architect and planner Constantinos A. Doxiadis and applied in 1960, as an on-

going project reviewing and re-adjusting the suppositions and variables unceasingly. The remarkable feature of the COF is its timelessness because of its validity in all times due to its continuous updating and revisions of the frame of urbanization reference. This is done through techniques and consideration of various qualitative and quantitative variables like time and space factors, population (growth rates, densities, distribution), resources (according to priority and significance, scarcity), habitable land with consideration of development cost (climate, topography and drinkable water) and income, and to further refine the predictions the use of further variables as education, health and so on (Bogdanou, 2003).

The goals, techniques and methodology

The main goals of COF project were to anticipate and put forward future alternative plans and models for human settlements on a world-wide scale, the scope of which would not be limited to theoretical sphere but also be used for practical implementation, for any place, any time with the primary focus being the "ANTHROPOS and his well-being" (Bogdanou, 2003).

Based on these goals of setting probability, the techniques for the COF included inferring the existing trends and setting the starting points for anticipating the near futures, use of assumptions for predicting furthest futures in periods or phases of high, medium and low, while providing the end points, and finally connecting these points with a probable curve.

The application of techniques to the different variables added precision and perfection to the forecasts for the city of the future.

The on-going use of the discoveries during the project implementation increased the edge for the future development in countries, e.g. Iran, Pakistan, and Greece.

The case of Islamabad, Pakistan is considered to be a success in the calculations of the forecasts and their use in city planning as it came out to be exactly as planned (Bogdanou, 2003) .

The fact that modelling and the construction of the project is such that it can be updated at any given point in time for any of the variables and the cross sections can be checked and reconfigured or re adjusted with the relative points and curves makes it a timeless technique, allowing for any momentum of the forecast to be checked even today for comparison (Bogdanou, 2003, Doxiadis, 1965).

The ideal city of Doxiadis:

Doxiadis being aware of the problems of the cities that are the heritage from the past or are a product of our own actions, focused and advocated considerations of the past, present and future of our cities to be better prepared and plan ahead for the future. From here came the idea of the city of future and the concept of Dynapolis that became the basis for many of his cities around the globe.

He being a scientist and founder of theory of ekistics and Dynapolis has advocated and was interested in finding the results of the same. The success of the cities depended on the knowing the true nature of problems of our cities in the past, at present and the future. The success is therefore measured in time according to him. Mapping the past, present and future of our cities and problems becomes relevant for the success of our cities. Todays, failure

means the problems becoming graver tomorrow and no longer will stand against the passage of time (Doxiadis, 1960a)

He gave a formula for categorizing the problems in order to be able to foresee and understand the requirements of what needs to be dealt with and defined the two categories as:

1. Problems common to all countries and areas of our era, and which will effect most of our cities in similar ways.
2. Problems of development which only affect, countries, areas and cities which are in the phase of development, insofar as changes occur in them which have not occurred up to now. Where they occur such problems are different in nature in developed countries and cities than in areas now developing and they may present a great variety of phenomena (Doxiadis, 1960a)

He has credited the problems of our cities largely to three major developments over the years- the population growth, the "machine" (transport, and modern technology) addition in our lives, the change in the family setups (breaking up of the large patriarchal families), patterns of living and socialization etc. which have contributed to the demand pressure for new human settlements and has affected the size and the primary influence on the quality. The qualitative effect of socialization has introduced essentials that were not known some time ago.

The units around which the cities are planned are also playing an important role in shaping the city and the patterns.

The unit for thousands of years used to be the man while later the transport (machine) replaced the man.

From the city of the past to the city of future:

The cities of the past were built to serve the needs of the past and for social and economic systems very different from today. However the city of the future is designed by studying the problems in the past and present in order to be able to deal with the problems that may be encountered in the future. The city of future requires thought for the unprecedented population growth, the economies, technology, all types of human communities and their needs.

Dynapolis- City of the future:

The Dynapolis is described as a dynamic city having potentials of dynamic development as opposed to the static city of the past and able to develop freely and naturally along a planned and predetermined course (Doxiadis, 1960a).

The four (planning) principles of Dynapolis that considered important from the conception to planning and design of city of the future are:

1- Unity of purpose

The first principle of a dynamic city is that it should be wide-ranging and include all social and economic groups and all types of functions fulfilling all types of needs. It demands that the project must be satisfactory economically, socially, politically, technically, culturally and aesthetically. This principle provides an extensive base for provision for all human beings and not for the privileged group.

2- Hierarchy of functions

The second principle is concerned with provision of facilities in a hierarchy from a basic settlement classification of minor shells (see Table 4 Ekistics Logarithmic Scale) and level three of basic ekistics unit the dwelling to the second tier of classification the micro settlements (units smaller than or as small as a traditional town where people achieve walkable interconnections), and further way up to higher classifications of settlement (Meso and the Macro settlements)

3- Freedom to develop dynamically-The four dimensions

The third principle of Dynapolis is the freedom to develop dynamically. This principle gives due importance to the fourth dimension- the time, as compared to the other three dimensions. Time was considered as an element of design that affects the concept and creation as well as the physical manifestation. The time and growth rate population has changed tremendously. The Dynapolis is considered to be a growing and expanding city and hence the forces of expansion (due to population, new means of transportation, new technology etc.) will affect the cities much more than the static forces. The time factor is thus considered as an important element of design that will influence city of the future.

4- Built on various different scales- many masters and many scales

The fourth principle of the Dynapolis is that the city should be built on various scales, which implies the elements that will determine the basic dimensions and proportions of the city. This means the units around which cities are planned will increase in scale and time and hence will affect the dimensions of the city. The earliest unit was the man and hence human scaled cities, where as the introduction of machine (cars) made the cities to be built around two scales that is man and cars. Later the cities would be built on three scales with man, car and aeroplane as the units as the airfield playing major role in the life of the cities and further four scales with the man, cars, aeroplanes and rocket.

Hierarchical structure of the Dynapolis

The division of the Dynapolis into different sizes was meant to correspond to the different functions also meant to follow a hierarchy. The structure of the city was thus meant to avoid muddle and disorder. The functions, buildings, roads, facilities etc. for the Dynapolis according to Doxiadis were to be designed and built according to their hierarchy of importance. So, the facilities for a sub-sector would be increased in the sector and further increased to a higher order in the super sector and so on (Doxiadis, 1960a). Figure 9 shows the hierarchical structure of the Dynapolis according to the community classes from I-VII and basic facilities that correspond to the respective community classes which is further explained in Table 4 also. Figure 10 shows physical hierarchy of communities as designed in the sectors of Islamabad. Community class V is one sector within the 2 x 2 km grid boundary with further subdivisions of the sector into subsector that correspond to community class IV and similarly further down with community class III, II and I. Figure 11 shows the original layout of concept of neighbourhood with community class III.

HIERARCHICAL STRUCTURE OF DYNAPOLIS

Community class VII

Community class VI

Community class V- Super sector
Super market

Community class IV- Sector
Secondary school, religious buildings, shopping centre

Community class III- Sector
Elementary school, play grounds

Community class II- Larger Neighbourhood
Gardens, shopping corner

Community class I-
Play grounds, neighbourhood meeting place

Houses

Figure 9: Hierarchical structure of the Dynapolis

Source: D-GA 318, pg133, DOX-PA 88

Figure 10: Hierarchy of communities
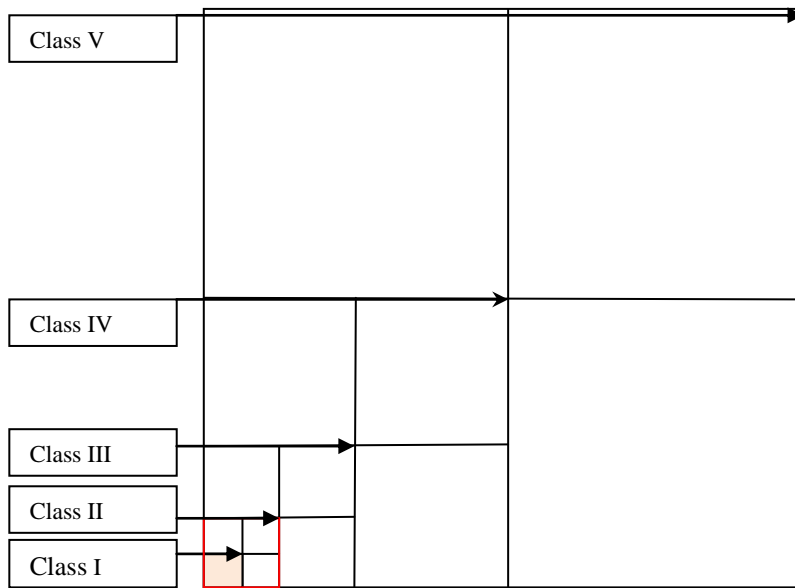
Source: Reproduced diagram by author (Original drawing- Review of Islamabad Master Plan, 1987); Courtesy: MPC- CDA
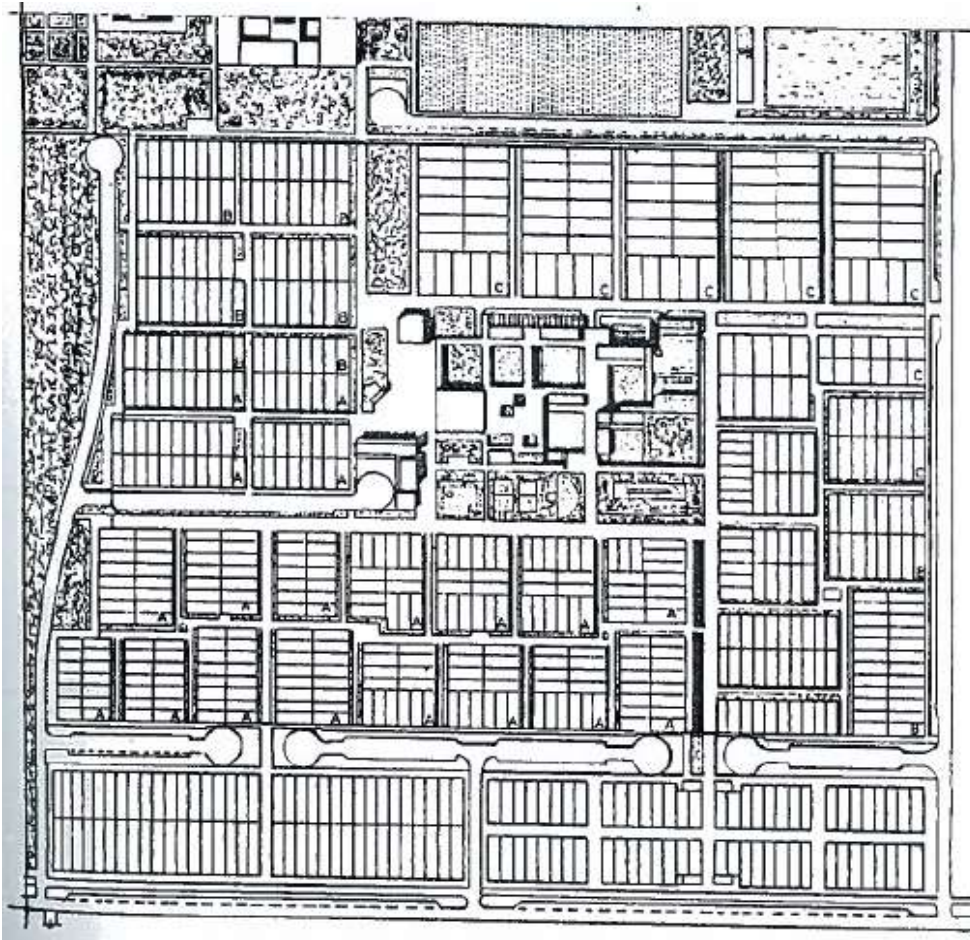
Figure 11: Neighbourhood concept Original layout plan of subsector G-6- ¼ (community class III)

Source: DOX-PA 168, 1962; Courtesy: CDA Library

The structure, form and size of the Dynapolis- city of the future (COF)

The ideal form of the city of future is considered to be a well-balanced development with unidirectional movement and also expanding in the other three directions also slowly incorporating the previous parts of the city.

The community sector forms the basic element and module defining the scale of the Dynapolis. The sector comprises hundreds or thousands of dwellings (ELS-3), a number of families and served by one or more types of central functions (elementary or secondary schools, shopping centres, community centres, places of worship etc.) keeping the focus on definition of Dynapolis- the city of future is dynamic and not static like the city of the past and hence cannot be designed without considering an influx from the neighbouring areas and hence future calculations.

Schematic scale of classification of hierarchical structure (refer to table 4) explains the functions that correspond to the community class according to their importance from smallest class I to further up and give a more permanent pattern for the Dynapolis.

Table 4: Dynapolis- distribution of community classes and provision of social and commercial facilities

Community class	Families	Persons	Functions and facilities at various levels	No. of units per 10,000 inhabitants
I	15-20	75-100	-	-
II	60-100	300-500	Kindergarten Small shop (Kiosk)	- -
III	300-400	1,500-2,000	Primary school Local market Firewood stalls Local mosque and Public open space Tea house Public toilets	4-5 4-5 4-5 4-5 4-5 2-3
IV	1,200-2,000	6,000-10,000	Secondary school Food market Mosque Community centre Local administration Local police post Tea house Cinema Dispensary Health centre Public baths Public laundry Public toilets Petrol station	1-2 1 1 1 1 1 1 1 1 1 1 1 1
V	6,000-12,000	30,000-60,000	Mosque Administrative buildings Public services Food market (open) Shops and offices Health centre Theatre and cinema Library, art gallery Tea shops, restaurants Hotel, hostel	- - - - - - - - - -

			Public baths	-
			Public toilets	-
				-
VI	30,000-60,000	1,50,000-3,00,000		
VII	1,50,000-3,00,000	9,00,000-15,00,000		

Source: Table developed by author

Courtesy: Information MPC- CDA, p.63, 1987 provision of social and commercial facilities in sector (community class V) Source: DOX-PA 90 Communities and Housing

2.2.3 Ekistics theory -The science of human settlements

Background

The Ekistics theory was floated by a Greek architect and urban planner, Constantinos A. Doxiadis in 1942. The theory which is an off shoot of the Dynapolis- COF project and evolved and influenced by the complexity theory, biology and the laws of nature, explains the five principles of the ekistics (mentioned in later) which are based on man's biological characteristics as cities are man-made environments made for the man.

The synopsis provided at the beginning of the article provides a background to the Ekistics theory, *"In order to create the cities of the future, we need to systematically develop a science of human settlements. This science, termed Ekistics, will take into consideration the principles man takes into account when building his settlements, as well as the evolution of human settlements through history in terms of size and quality. The target is to build the city of optimum size, that is, a city which respects human dimensions. Since there is no point in resisting development, we should try to accommodate technological evolution and the needs of man within the same settlement"* (Doxiadis, 1970).

The Ekistics consideration of the fourth dimension and the morphogenesis balances the convergence of the past, present and future in the human settlements and system. Hence it is capable of dealing with the complexity of resent and future while dealing with the new forces entering the system. It enables creative coping with the population growth, rapid change and pressure of large scale high density settlements. Its multi-dimensional approach examines built forms, interface of time, movements and systems in the built environment. Hence is adaptable and capable of dealing with the advances in time, making links between different disciplines.

Ekistics five elements forming a system

While explaining the complexity enshrined in the subject as a third case Doxiadis says, *"The whole range of human settlements, is a very complex system of five elements - nature, man, society, shells (that is, buildings), and networks. It is a system of natural, social, and man-made elements which can be seen in many ways - economic, social, political, technological, and cultural. For this reason only the widest possible view can help us to understand it."* (Doxiadis, 1970)

These five elements have the man as the primary element, while the nature and society form the secondary and the shells and the networks as the tertiary elements. (Figure 12)
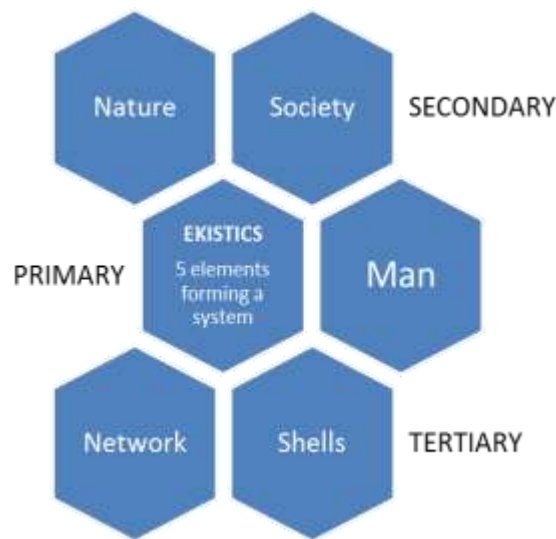
Figure 12: Ekistics- Five elements forming a system

Source: Author

The five principles of Ekistics

According to Doxiadis, (1970, p. 2) *"In shaping his settlements, man has always acted in obedience to five principles".*

These five principles hence form the basis of ekistics, which are:

1. Maximization of man's potential contacts with the elements of nature (such as water and trees), with other people, and with the works of man (such as buildings and roads).

2. Minimization of the effort required for the achievement of man's actual and potential contacts. He always gives his structures the shape, or selects the route, that requires the minimum effort.

3. Optimization of man's protective space, which means the selection of such a distance from other persons, animals, or objects that he can keep his contacts with them (first principle) without any kind of sensory or psychological discomfort.

4. Optimization of the quality of man's relationship with his environment, which consists of nature, society, shells (buildings and houses of all sorts), and networks (ranging from roads to telecommunications). This is the principle that leads to order, physiological and aesthetic, and that influences architecture and, in many respects, art.

5. Finally, and this is the fifth principle, man organizes his settlements in an attempt to achieve an optimum synthesis of the other four principles, and this optimization is

dependent on time and space, on actual conditions, and on man's ability to create a synthesis. (Doxiadis, 1970)

Ekistics as a tool to deal with complexity of cities

Doxiadis has explained the Ekistics as the science of human settlements required to deal with the complexity of the cities as a tool, and has explained the logic behind each principle using idea of forces entering the game and the value of the fourth dimension.

The idea of forces is coming from the needs of the humans pertaining to settlements that affect the settlement form. **Needs** discussed here are generally reflected as the physical, social and psychological which are explained as essential requirements of the humans relating to the settlements. These three types of spatial needs are addressed in the principles of ekistics. This includes **elementary need for physical space** engaged by people and space for performing diverse activities and functions including their **social needs for interactions** and privacy. The spatial needs of humans have a relation with the patterns of movement, living and cognitive patterns and this affects the physical form of space and networks.

The multidimensional nature of the subject of human settlements requires a complete and systematic picture with four dimensions, the importance of which should not be ignored (Doxiadis, 1965) This fourth dimension consideration remains a very strong point for the ekistics theory and which implies the theory has determinant nature and futuristic approach.

The biological analogy that underlies the ekistics theory is acknowledged by Doxiadis with a caution: "*There can be no doubt, I think, that human settlements are very complex biological individuals. Human settlements can be neither cells nor bodies nor organisms. We are, therefore, entitled to consider them as biological individuals of a higher order than cells or organisms*" (pp.41/42) Doxiadis- book ekistics. .

He terms cities as growing organisms and says **they need to satisfy** all types of development whether social, political, aesthetics, economic and so on. The ekistics theory has thus addressed this by knowledge integrated from various disciplines such as the economics, social sciences, cultural disciplines, technical discipline, political sciences and the administration. This has resulted in the theory addressing the complexity that arises from the various subjects that cannot be separated from the human settlements development. (Figure 13)
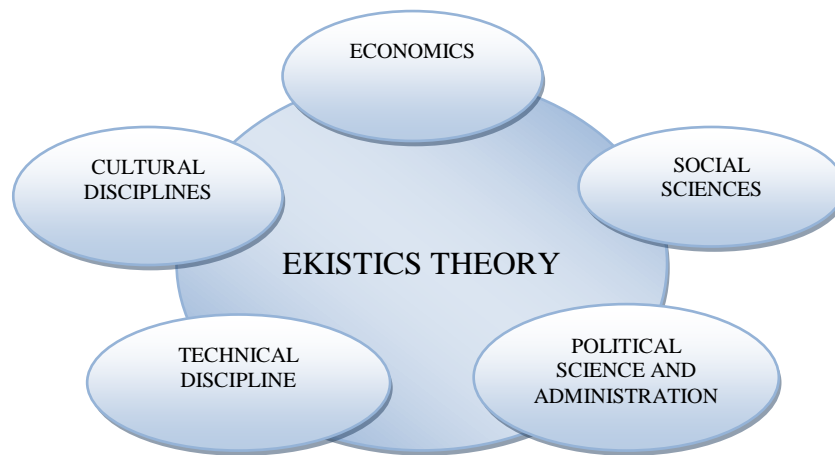
Figure 13: Ekistics and the sciences directly contributing to it

Source: Adapted from C.A. Doxiadis, Ekistics, 1968, p.55

Ekistics logarithmic scale- ELS

Doxiadis introduced a Logarithmic scale that is composed of 15 ekistics units for explaining different scales of human settlements. The scale division is such that the basic or the elementary unit of the scale is the man himself. The units then combine and the collection of those units according to the population size develops into a hierarchy of the units. Doxiadis' book Action for human settlements (p. 186, 1976) explains the ideal future ekistics units which were calculated by him till the year 2100. This is seen as a remarkable work of Doxiadis in the field of urban development. Table 5 shows the units, their respective populations and the classification of the settlement.

Doxiadis suggests divisions of an optimal size which can best be dealt with are 2 X 2 km as this is suitable for pedestrians. This size corresponds with the ideal range for pedestrian movement which is ten to twelve minutes' walk.

Table 5: Ekistics Logarithmic scale- ELS

No	EKISTIC UNIT NAME	POPULATION SCALE	SETTLEMENT CLASSIFICATION 4 TYPES	DESCRIPTION
1.	Anthropos	1	MINOR SHELLS,	Elementary units, man, room and dwelling
2.	Room	2		
3.	Dwelling	5		
4.	Dwelling group	40	MICRO-SETTLEMENTS,	Units smaller than, or as small as, the traditional town where people used to and still do achieve interconnection by walking.
5.	Small neighbourhood (village)	250		
6.	Neighbourhood	1,500		
7.	Small polis (town)	10,000		
8.	Polis (city)	75,000	MESO-SETTLEMENTS,	Between the traditional town and the conurbation within which one can commute daily
9.	Small metropolis	500,000		
10.	Metropolis	4 million		
11.	Small megalopolis/ conurbations	25 million		
12.	Megalopolis	150 million	MACRO-SETTLEMENTS	From the Megalopolis till the largest possible expression of Ecumenopolis
13.	Small eperopolis	750 million		
14.	Eperopolis	75,00 million		
15.	Ecumenopolis	50,000 million		

Source: Developed by author based on Ekistics grid (Doxiadis, 1968)

2.2.4 CSIR guidelines for human settlement planning and design

The issue of human settlement development was taken up by the department of housing of the South African CSIR (Council for Scientific and Industrial Research) building and construction technology in form of the red book (renamed as the guidelines for human settlement planning and design). The idea of the guidelines was to provide a framework for settlement making to produce sustainable and vibrant human settlements.

The book considers a *"human settlement" as any built environment where people live, work and play, with the provision that only residential areas and other developments associated therewith"* (CSIR, 2000).

The contrast of the needs or hopes of communities are important to understand in order to provide the settlements with sufficient and satisfactory services for positive performance in order to make them a success.

The guidelines suggest that efficiency and habitability of the settlements are related to the investments in the infrastructure. It promotes the incremental provision and development of "sustainable and affordable levels of service" (CSIR, 2000)without compromising the acceptability and functionality.

The scale and the order in the spaces signify the transition in the distribution of public and private space. The public places according to this document become the points of contacts with other people.

CSIR (2000) Principles for settlement planning and design

Six Structural principles

1- Principle of reinforcement

This principle provides for unified modes of movement brought together to a single passage thus generating a range of structural opportunities in addition to providing prospective for establishment of major activities point at stopping points for all modes.

2- Principle of continuity

Continuity of green space

People are said to function in a combination of landscape which is composed of the natural and the man-made landscapes hence accessibility to both in their settlements is an essential need. Continuity of green spaces hence turns out to be a vital element of the human settlement which promotes ecological diversity in addition to fulfilling an important human need. Two important points for the green spaces are that;

1- The green space should be productive space. It requires maintenance and has a significant role to play in the support of the urban systems. The role of the green space as an important additional source of nutrition and income for the people.

2- The green spaces can absorb outputs from the settlements.

Continuity of movement

The principle relates to the patterns of movement, flow and accessibility of all sorts (people, services etc.) brings dynamism to the network of the settlement. This movement hence creates an order in the structure according to the degrees of exposure, the accessibility and the links in the network. The reinforcement of certain areas is created by co-ordination of different modes thus providing highest accessibility, hence "*attracting and creating opportunities for the clustering of activities*". The activities hence fit in the structural system of the settlement according to the function, scale and formality etc. creating a land use pattern which is highly "*synergistic*" and benefiting each other.

Continuity of built form

The principle relates to the scale dimension of the settlement and says that the conscious breaking of continuity of the built form is essential to create ease of access to the natural and man-made landscapes.

Continuity of public space

Public spaces are said to be made as continuous networks with enclosure and definition of the public space.

3- Principle of discontinuity

The principle promotes breaking of the continuities of the components in the urban system for certain benefits to the settlements.

Discontinuities of movement

Discontinuities along the major routes (higher-order routes) can create public spaces like squares and parks which can correspond to greater community. The discontinuity can also be used for the integration of natural and rural areas into urban landscape. Similarly discontinuities along the lower-order routes can create an order of privacy and safety by discouraging through traffic.

Discontinuities of built form

The break in the built form by adding parks or public open spaces enhances the quality of space while creating variety in the built environment.

4- Principle of externalization

According to this principle the higher-order urban activities and social facilities should be *"externalised"* and located along major and more continuous routes of movement. This ensures the accessibility of the activities and facilities by wider communities and enhances privacy of the residential areas.

5- Principle of concentration along routes

The principle suggests that the concentration along the routes is diversified as the points of accessibility along the routes also differ. Hence the most accessible points will have a higher tendency of concentration of activities and facilities.

6- Principle of accommodating sameness and diversity

This principle says accommodation of sameness (homogeneity) and diversity (heterogeneity) is what forms an important characteristic of successful human settlements. It means diversity of cultural, economic and appearance. It also relates to the diversity in terms of creation of different levels of privacy and exposure and hence creates an order in the space.

Four spatial principles

    1. **Definition of space**

By the use of physical elements (manmade and natural) such as walls, plants etc. enclosures can be created for space demarcation. It can be for the purpose of creating distinction between private or public or even separation of spaces.

    2. **Scale**

This principle especially corresponds to the human scale aspect of space. It involves judgement about relationships such as size, distance and height which the humans feel comfortable with.

    3. **Flexibility in spatial structures**

Flexibility remains an important feature to allow and accommodate unforeseen or unanticipated demands made over time.

    4. **Intensity of space use**

Intensity of space use does not imply regulation of living conditions; in fact choice of living environments is enabled in a number of ways which have positive spinoffs.

2.3 The relationship and significance of the various concepts.

The various concepts in the literature review relate to the human settlements making and hence we see their relationship in the following text.

2.3.1 Morphogenesis, new forces and time

This idea of city's development being a morphogenetic process and the new forces entering the system which Doxiadis terms as "game" is also argument that underlies the ekistics city. He claims that different patterns each of certain character and type evolve as several forces enter the system but their relationships change from case to case, as a morphogenetic property. The idea of morphogenesis in the urban development and emergence is also explained by Portugali (2011) who says that when a planner or policymaker perceives cities as such, according to Portugali *'a new type of action in the city, a new type of city planning' is needed, in order 'not to control, but to participate' in urban processes* (Portugali, 2011); (Boonstra and Boelens, 2011). *"The outcomes of such processes manifest themselves in specific urban forms and patterns (morphological or functional), physical growth or the emergence of new socio-spatial groups as a result of certain geographical settings or characteristics such as houses, lots and housing blocks* (Portugali, 2011).

2.3.2 Cognitive science, complexity science and the emergent and organic cities

Michael Batty (2008) in his editorial "Very complex systems, very hard problems" emphasises on the need for complexity science to embrace the issues of cognition more firmly, to explore the notions of adaptation and so on.(Batty, 2008)

Juval Portugali (1997, 2011) has also expressed the need for having a "complexity- cognitive approach to planning", as the relation of the **cognition** of those who inhabit the city and complexity arising from them is vital to understand for creating a synthesis of the same. So, the perception and cognitive capability of humans, including the complexity understanding are more important for dealing with the city planning. (Portugali, 2011)

Juval Portugali (1997) explains how the human brain sees and perceives patterns. The physical or the material pattern is what he sees and creates a map in his mind. This creation of map in the mind is the cognition property by which he makes a sense of the physical world.

2.3.3 Dynapolis/ COF, Ekistics, and the emergent and organic cities

The Dynapolis- the city of future was the project on which hundreds of scientists and theorists of that time worked. The futuristic project was meant to be timeless and adjustable while providing a framework for the planners. The ekistics like the COF is a futuristic theory for human settlements development. The basis in both cases is the man and his well-being. Since the concepts of COF and Ekistics accommodate the open ended urban change and allow for adaptability and flexibility it improves the chances of development meeting the needs of the people with respect to changing times and preferences.

The complexity theory and the cognition science that gave emergent or organic cities preference comes from the fact that futures are unpredictable and hence the urban change should be allowed to emerge and grow as organic rather than into a finite design.

However, the open ended theme and the concept of new forces accommodation and adaptation in time in the COF and the Ekistics show the complexity control and the cognitive capability of humans that can attain a position of creating a science that is timeless and address the needs of the man.

2.3.4 The Dynapolis, Principles of Ekistics and the spatial and structural principles for human settlement planning and design CSIR (2000)

The six structural principles and four spatial principles of CSIR guidelines for human settlement planning and design (2000) correspond to the five principles of ekistics and relate to the theory of ekistics closely although the document does not provide any precedence or acknowledgement of ideas from 1942. Hence the study bears relevance and aids in understanding the nature of the settlements performance and the success.

According to the document the spatial structure of a human settlement is the outcome of chemistry between the planned and the unplanned proportions. The concept of Dynapolis the

city of the future Islamabad is based on such chemistry where the planned and the unplanned have certain defined functions for the city to be self-sustainable.

The guidelines for human settlement planning and design (CSIR, 2000) differentiate the planned and the unplanned or spontaneous settlement with quantitative and qualitative qualities. The planned mostly necessitates the land use, development and engineering budgets while the unplanned or spontaneous is mostly a reflection of the people's preferences and priorities and hence shape they give over time to the overall development to address their needs while enriching their lives. While the planned settlements depend and are affected by technology, levels of budgets and means, the spontaneous are not dependent on these to function and perform well. However the planned settlement in case of Dynapolis functions on the principle of sustainable development and has a high regard for the qualitative qualities to enrich individuals and communal life.

According to CSIR (2000) "settlements are characterised by diversity". This is based on the distribution of spaces and the setting of boundaries for distinguishing the private and the public realms serving miscellaneous people and activities.

The principles of Ekistics correspond to the structural and spatial principles of the CSIR and help explain the success factors through the performance qualities in human settlements.

Principle 1 of the Ekistics which is *maximization of man's actual and potential contacts* corresponds to the "*opportunity generation*" quality of the CSIR (2000) for improvement of personal welfare from spatial conditions in settlements. The settlements are thus seen from the point of diversity, choices of places, activities and interaction opportunities they offer to a wider homogenous and heterogeneous community in form of public places, public institutions that are of utmost importance to the society like places of worship, academic institutes, markets etc.

Spatial principle 4 of the CSIR, *the intensity of space use*, provides an indicator for the frequency of use of the contacts.

Principle 2 of the Ekistics which is minimization of effort in maintaining the contacts corresponds to the "*convenience*" and explains the forms of access that are essential in promoting convenience. It also corresponds to the spatial principle 4 of the CSIR- *the intensity of space use,* as one of the positive spin-offs it caters to is its contribution to the compact environments with contrasts within the structural systems and *reduced travelling time and which aids ease of access*. It also corresponds to the spatial principle 2 which is *scale (size, distance and height)* as the *human scale* defined by the Ekistics and the CSIR is one with which humans are comfortable with. This scale is related to movement patterns and maximum distance achieved with ease is in ten minutes according to the theory of ekistics.

Principle 3 of the Ekistics which is *optimization of protective space* corresponds to the "*choice" and "space*" factor in the settlements which provide "*either-or choices*" and relates to the "*degrees of privacy or exposure*" ultimately defining the private and the public space. This principle relates to "physical space" in the settlement, which is defined through the psychological security. This means attainment of comfort level for the people in the settlements for living, accessing and performing activities within socio-cultural parameters

and norms of the settlements. The corresponding structural principle 6 of the CSIR (2000) which *accommodates homogeneity and heterogeneity* relates to the definition of order in the diversified space. The provision for contact in settlements in desired gradations of social engagement and independence is what defines the protective space. It also relates to the physical security by physical ordering of the space which is defined as physical safety through hierarchy of spaces defining the public, private and transitional spaces and its relation to the socio-cultural space definition for defining the psychological space definition (boundaries of comfort zones). A parallel structural principle of CSIR (2000) that aids protective space optimization is the *principle of externalization* (Structural Principle 4) which enhances the privacy of the residential areas thus providing a physical and social protective space ordering. The *principle of discontinuity* of the CSIR (2000) (structural principle 3) also aids in creating different levels of public private space definition.

Principle 4 of the Ekistics which is the optimization of the quality of relationship of man with his environment and it corresponds to the ideas of *quality of place, sensory qualities* and to an extent the *choice* (CSIR, 2000). This is the principle that leads to order, physiological and aesthetic, and that influences architecture and, in many respects, art as explained by Doxiadis.

Principle 5 of the Ekistics which is achieving an optimum synthesis of the first four principles which is dependent on time, space and actual conditions and man's ability to create synthesis corresponds to the *sustainability* in the human settlements which reflects the *timeless qualities*. The CSIR (2000) also provides a synthesis of the six structural and four spatial principles which is important in establishing positive performance of the settlements thereby leading to success. Spatial principle 3 which is *flexibility* directly corresponds to this principle in terms of accommodation of unanticipated demands and changing needs over time which Doxiadis calls forces.

2.3.5 "Successful Human Settlements" vs. "Positively Performing Settlements"

The debate of plan or not to plan and the subsequent arguments in favour and against planning lead to the main focus of the study which was what makes successful human settlements?

The **"success"** which is otherwise difficult to define and measure in human settlements here is restricted to the definitions from the main theme of the study Ekistics- "the science of human settlements" and supportive document CSIR guidelines.

Doxiadis suggested that human settlements are successful when the needs of humans pertaining to the human settlements are satisfied and they promote happiness and safety. He also gave a formula for the needs satisfaction through compliance with the five principles of Ekistics (Doxiadis, 1970). Hence this explanation is used to explore the indicators of successful human settlements which are satisfaction of needs, feeling of safety and happiness in the settlements.

Satisfaction of needs in relation to the principles of Ekistics is hence defined in parameters of physical needs, the social needs and the psychological needs pertaining to the settlements.

The needs in terms of preferences however can change over a period of time and hence settlements need to be flexible enough to be able to accommodate the changes in time.

Happiness is however a difficult to measure indicator but the quality of relationship which is the fourth principle of Ekistics is rather explanative of this indicator. Happiness is also taken as a psychological state of well-being in the settlement and hence leads towards the contentment and satisfaction of the psychological need. Since happiness can be a conscious choice and also an automatic response, it may have different meaning to different people living in different cultures and situations. Hence the principles of ekistics also help to understand what makes the humans happy in their settlements. Happiness is related to the cognitive evaluation of state of being in the settlements hence it requires seeking perceptions, experiences and feelings of humans in relation to their settlements.

Safety is another state of human feeling by which man pursuit's security and protection against the physical, social and psychological or other types of conditions. The third principle of Ekistics corresponds largely to this indicator and explains how much exposure or level of risk a man is willing to take in his settlement. This is explained through the physical boundaries that he defines for his protection and privacy sometimes guided by the religious or social norms of the society. Safety may be perceived in different ways by different people hence security and level of comfort in relation to their settlements are related concepts that can be used to inquire people's state of feeling. According to CSIR (2000), appropriate design can contribute to crime reduction by ensuring visibility, multifunctional strategic location of different land uses, well defined outdoor spaces encouraging social interaction and clear definition of pedestrian routes etc.

Another characteristic of settlement growth which Doxiadis indicates and which may be related to the success in the human settlements is that the settlements always grow in the areas of greatest *attraction* and least resistance (Doxiadis, 1968, Doxiadis, 1970). Here the attraction can be a meaningful indicator but to what extent the attraction corresponds to the needs concerning the human settlements? This attraction can be defined by Doxiadis' claim of cities behaving as organisms that need to satisfy social, aesthetic and economic and other needs. Hence attraction can be economic feasibility, social system or unique physical or *sensory qualities* (CSIR, 2000) of elements in the settlement whether natural or man-made that either satisfies the aesthetic needs or the convenience or security etc. that add to the quality of life of the residents. However attraction too like safety and happiness is largely dependent on and is differentiated by the perceptions and meanings people give to it.

The *positive performance of settlements* (CSIR, 2000) can contribute largely to attaining happiness and satisfaction in the human settlements and hence another indicator and meaning associated to the success is the *performance quality of the human settlements*. For this the CSIR (2000) states three starting points which are seen to correspond with the principles of Ekistics:

- The importance of pedestrian movement which is largely associated with the scale and hence the location of the contacts with respect to man which provides ease of access by walking (Principle 2 of Ekistics).

- The importance of spatiality according to which public space is viewed as "*highest level of social infrastructure*" (CSIR, 2000) which affects the quality of relationship (Principle 4 of Ekistics) and hence the quality of life which in turn can affect the happiness and satisfaction of people to define success of human settlements.

- The third starting point is the minimalist approach to design which means allowing spontaneity in a human settlement that makes settlements flexible and adaptable to accommodate the changing needs in time (Doxiadis, 1968)an idea which is the soul of Ekistics and the COF and corresponds to the fourth dimension of time and forces entering the game.

The structural principle 6 of the CSIR (2000) defines the "*successful human settlements*" as the ones "*that reflect diversity in terms of areas of sameness, areas of diversity or mixed-use development, areas of cultural homogeneity and areas of cultural diversity*"(CSIR, 2000).

The *continuity of movement* (structural principle 2 of the CSIR, 2000), *the principle of externalization* (structural principle 4 of the CSIR, 2000) and the *principle of concentration along the routes* (structural principle 5 of the CSIR, 2000) creates a system that attracts and creates opportunities for the clustering of activities works as an ecosystem where each part of the system supports and benefits the other. This is in accordance with Doxiadis' idea of people tending to gravitate in areas of greatest attraction and least resistance and relates to the importance of location of facilities.

2.4 Conceptual framework

The literature review guided the research in the direction that developed the following conceptual framework.

The statement given by Hamdi Nabeel (2004) that we need both the planned and the emergent which supports the actual situation of the Dynapolis of Islamabad, takes the lead in the following research as there is a need to cater to both in the existing situation of problems of our cities today and in context of Islamabad too.

Coming to Doxiadis' (1970) claim of the need to create or have such a science to deal with the development issue of human settlements and that it actually existed in the past which Portugali (2011) and Marshall (2009) both have agreed upon, guide the research to finding the right approach to dealing with the complexity of the situation using the science called Ekistics, originated by Doxiadis himself in 1942. Does the co-existence as suggested by Hamdi (2004) and worked in the Master plan of the Dynapolis produce a spatiality that satisfies human needs (physical, social, psychological, economic etc.) and a spatiality that can be managed and developed well solving the dilemma of our cities.

The conceptual framework (figure 14), comes from plan or not to plan debate and the idea of co-existence of the planned and the spontaneous or emergent settlement because of importance of both, the structures designed and that are enabled to emerge (Hamdi, 2004). The resulting spatiality may take different forms (Mooney, Pile, et al., 1999) reflecting the key features that characterize the complexity theory which produces a socially ordered spatiality, which is the most sought after new image as termed by Portugali (1997) and which

is taken as a complex adaptive system referred to as the emerging property of the self-organization (Boonstra and Boelens, 2011). It also corresponds to the needs of humans. From the principles of Ekistics given by Doxiadis (more than eighty years ago, which has been practically used in urban planning in more than 40 countries all over the world, and taking into account the concepts of complexity, with consideration to changing needs of time), my assumption of the theory is that being extension of the biological characteristics of humans, it should form the basis of most of human settlements as it is based on human instincts whether planned or through ideas of emergence. All the arguments that have focused on emergence use the metaphors like beehives (Marshall, 2009), and waves all that drive towards the instincts and complexity due to chance factors (Gerrits, 2012). Hence the pattern of spatiality may differ due to probability but the urban system arising will be harmonious and stable in manner. Doxiadis (1970, p.3) talks of "successful human settlements" "that have achieved a balance between man and his man-made environment, by complying with all five principles of Ekistics" (Doxiadis, 1970). Hence, whatever the case may be, we see the intermediate influencing chance factors that add to the complexity of the cities and may affect the outcomes on the second category of ELS the micro-settlements and further in the larger context of the third category of ELS the Meso-settlements. The assumption here is that since the two types of settlements being researched upon belong to the two different categories i.e. planned and the emergent and form a physical and social reality in the context of Islamabad (as in many other new towns of the world facing similar problems), they have so far and will further eventually co-exist according to Nabeel Hamdi's (2004) idea of co-existence.

For better understanding of the sequence it has been illustrated in figure 14 below.

Figure 14: Conceptual Framework-

STARTING POINT- THE DEBATE	**PLANNED vs. UNPLANNED** Van den Broeck (2004) Albrechts (2004) Boonstra, Boelens (2011) Marshall Stephen (2009, 2011) Juval Portugali (1997, 2011) Mooney, Pile et al (1999) Allmendinger (2009) Alan Turner (1992) Kevin Lynch (1981)
	COEXISTENCE OF BOTH THE PLANNED AND THE UNPLANNED Nabeel Hamdi (2004) Mooney, Pile et al (1999)
THE MAIN THEORY	**THE DYNAPOLIS- CITY OF THE FUTURE EKISTICS THEORY** Constantinos A. Doxiadis (1942) PLANNED AND UNPLANNED
THE GOAL	**SUCCESSFUL HUMAN SETTLEMENTS**
PREREQUISITE	FACTORS DETERMINING THE SUCCESS OF HUMAN SETTLEMENTS
	COMPLIANCE WITH **THE 5 PRINCIPLES OF EKISTICS** 1. Maximization of man's potential contacts 2. Minimization of effort for achieving contacts 3. Optimization of protective space- definition of territories 4. Optimization of quality of relationship with environment (nature, society, shells and networks) 5. Synthesis of the other four principles dependent on time and space, on actual conditions and man's ability to create synthesis.
OUTCOME	**SUCCESSFUL HUMAN SETTLEMENTS** CHARACTERISED BY • SATIFACTION OF NEEDS • PROMOTION OF HAPPINESS AND SAFETY • BALANCE BETWEEN MAN AND ENVIRONMENT

Source: Developed by author

Chapter 3: Research Design and Methods

3.1 Research design

This chapter explains the research methods used to answer the research question. It covers the research question operationalization of the concepts through variables and indicators identified through the literature. The instruments used, the sample size, the sources and the approach is further discussed in the section. The chapter is divided into two main parts. The first is the research design and the second the research methodology.

3.1.1 Approach

The research follows a comparative case study approach as the study tends to seek answers to the success factors of both spatial structures (planned and unplanned) of human settlements.

It explores and explains the two contrasting spatial structures (planned and unplanned), their relationship and impacts. For this examples of planned and unplanned human settlements from Islamabad with similar sizes (equal to the size of one grid-iron planned sector which is within 2 x 2 km) are studied to explore the wide range of possibilities and factors that affect the relationship which may or may not be causation.

Literature review and secondary data helped obtain knowledge of the general concepts of spatial patterns of the planned and the unplanned settlements under consideration and development they have followed over time for a better understanding of the external forces acting on the development.

The research type for this study on the basis of objectives is **exploratory** as it tends to find the forces and impacts of the spatial patterns on the social, psychological and environmental (physical and natural) development, and also the impacts of occurrences, incidents or events in time. It is also **explanatory** in nature as it explains the relationship between the spatial material patterns of cities and the cognitive patterns or perceptions. To some extent the study is descriptive also as it entails all important details of the spatial planning, the physical aspect and location factor, the history, master plans and the changing scenarios over time due to the emerging trends and forces acting on the city.

Figure 15: The research design approach

The growth of city of Islamabad and changing patterns in a city that accommodates both the planned and the unplanned spatial structure	→ ←	PROBLEM
Assessing and measuring the success of human settlements- using Ekistics theory	←	OBJECTIVES AND RESEARCH QUESTIONS

LITERATURE REVIEW

Cities- Perceptions
Cities- To plan or not to plan debate
Cities- Arguments in favour and against planning
Cities- The middle path of co-existence
State of the art theories:
Dynapolis- the city of the future
Ekistics theory
CSIR 6 Structural principles
4 spatial principles
Successful Human Settlements vs. positively performing human settlements

THEORETICAL AND CONCEPTUAL FRAMEWORK

The planned vs. the unplanned

Variables and indicators from literature
Patterns
Ekistics5 principles

OPERATIONALIZATION

Secondary data

(What was planned and intended. Documents, Plans, researches, recent developments, future planning)

Primary data
(Spatial characteristics)-
    a. Material patterns
    b. Cognitive patterns- Existing situation and change. Observations, In-depth interviews, Questionnaires, site visits, photographic documentation)

RESEARCH METHODOLOGY

Qualitative,
Exploratory
Descriptive
Explanatory

DATA COLLECTION

DATA ANALYSIS

Explanatory and Descriptive-

Atlas-Ti

CONCLUSIONS AND RECOMMENDATIONS

3.2 Operationalization: Variables, Indicators

Based on the literature review and research approach the following variables (Table 6) were identified to assess the success of the planned and the unplanned human settlements in Islamabad.

Table 6: Operationalization

Variables	Indicators	Methods-Tools	Sources of Information
PATTERN Sub variables **1. Material pattern**	1. **Material indicators: physical structure** 1.1. The <u>pattern</u> of built fabric 1.2. The <u>hierarchy</u> of urban spaces, 1.3. The <u>hierarchy</u> of street systems, 1.4. The <u>hierarchy</u> of buildings	Maps, plans Photographs Blue prints Observation In-depth interviews CIT	Residents of the settlements Experts in the field
Ekistics Principle 1:	**Maximization of man's potential contacts with the elements of nature, with other people, and with the works of man**		
1. **Contact with nature** 2. **Contact with other people** 3. **Contact with the work of man.**	1. **Contact with nature:** 1.1. <u>Existence</u> of nature (parks, lakes, forest, or open natural areas); 1.2. <u>Frequency</u> of contact with nature. 2. **Contact with other people:** 2.1. <u>Existence</u> of public space for social interaction; 2.2. <u>Frequency</u> of contact with such places of encounter; 3. **Contact with the work of man.** 3.1. <u>Existence</u> of markets, schools, places of worship etc. 3.2. <u>Frequency</u> of contact with these places	Observations In-depth interviews structured questionnaires	Residents of G-6 and Bhara Kahu Experts in field
Ekistics Principle 2:	**Minimization of effort in achieving contacts**		
1. **Effort for Contact with nature** 2. **Effort for Contact with other people** 3. **Effort for Contact with the work of man.**	1. **Effort for Contact with nature:** 1.1. <u>Distance, ease of access</u> to nature (parks, lakes, forest, or natural areas); 1.2. <u>Modes and time</u> to access these places (walking, public transport, car), etc. 2. **Effort for Contact with other people:** 2.1. <u>Distance, ease of access</u> to such places of encounter; 2.2. <u>Modes and time</u> to access these places of encounter; 3. **Effort for Contact with the work of man.** 3.1. <u>The distance, ease of access</u> to the other houses, commercial areas, schools, offices, places of worship etc. 3.2. <u>Modes and time to access</u> these places	Observations In-depth, semi-structured interviews structured questionnaires	Residents of G-6 and Bhara Kahu Experts in field
Ekistics Principle 3:	**Optimization of man's protective space**		
1. Protective Space	1.1. <u>Awareness</u> of the environment 1.2. <u>The perception</u> of safe distance 1.3. The <u>distribution</u> of the personal, private, and public space	In-depth interviews, structured questionnaires, Observations	Residents of G-6 and Bhara Kahu Experts in field
Ekistics Principle 4:	**Optimization of the quality of man's relationship with his environment,**		

	which consists of nature, society, shells, and networks.		
1. **Quality of Relationship of man and nature**	1. **Quality of Relationship of man and nature:** 1.1. The <u>connectivity</u> between elements of nature and man. 1.2. <u>Influences</u> on (quality) of nature. 1.3. <u>Use</u> of green spaces/ water bodies etc. as bifurcations or transitional spaces. 1.4. <u>Awareness</u> of surrounding natural areas/ nature reserves etc.	Observations In-depth interviews structured questionnaires	Residents of G-6 and Bhara Kahu Experts in field
2. **Quality of Relationship of man and society**	2. **Quality of Relationship of man and society:** 2.1. <u>The social integration</u> and Sense of well-being. 2.2. <u>Influences on relationship</u>. People's <u>perception</u> of them and society (a part of society or apart from society) 2.3. <u>Existence of social networks</u> 2.4. The <u>frequency</u> of social interactions 2.5. <u>Use of social networks</u> 2.6. <u>Awareness</u> of social issues		
3. **Quality of Relationship with built environment**	3. **Quality of Relationship of man with built environment:** 3.1. The <u>physical connectivity</u> 3.2. <u>The Influences</u> on relationship of built environment and people. (Organization, The physical quality of urban spaces, street systems, built fabric etc.) 3.3. <u>User perception</u> of them and the place- sense of association, ownership, belongingness 3.4. <u>Awareness</u> of built environment.		

Source: Developed by author

3.4 Data Collection Methods

A combination of data collection methods was used. Qualitative research was mainly followed to understand the what, how and why of the system and the relation of theory and practice of planned and unplanned settlements. The principles of Ekistics theory were used for comparisons and assessment of the settlements but focused on the findings, leading to facts in situation and to find the existence of co relations. Table in Annex 3 gives the tasks schedule for the field work period.

Steps for research

1. Taking zoomed out view of city of Islamabad.

2. Using **Critical Incident Technique- CIT** as a task analysis, investigative and exploratory tool to identify settlement which is unusual or out of norm of the regular pattern given by Doxiadis.

3. Zooming in on the unusual pattern for further investigation.

4. Due to the limitation of time the further investigation is only for the physical patterns, order and form, and to an extent the perceptions that form the mental patterns.

5. Determining the factors responsible for the unusual pattern. Using the CIT as an investigative and exploratory tool to identify the spatial patterns (material and cognitive). Performance in usability -oriented context. Usability problems and design flaws?

Box 1: Critical incident Technique

Critical Incidents Technique: CIT

The Critical Incidents Technique is a method of gathering facts from users in order to gain knowledge on how to improve performance on a system or in any work related aspects. The method takes the form of either (or a combination of) an open ended questionnaire, retrospective data, Interviews.

The three stages of the CIT are:

- Gather facts

- Analyze the content

- Infer how to improve performance based on the above.

The most important aspect in performing a CIT is to always ask user what lead up to the event and what happened as a result of the event in order to ascertain ways of avoiding the event (if negative) in the future.

Source:

3.4.1 Sample Size and Selection

The research population comprises the sector G-6 (planned human settlement of Zone I) and Bhara Kahu (unplanned human settlement from zone IV sub zone B2) of Islamabad. Ekistics logarithmic scale (ELS) in Table 4 is used to define the sample size by categorizing and scale. The population for the research belongs to category two which is the Micro-settlement and the scale is between ELS 4-7. The population size of the unplanned human settlement of Bhara Kahu is selected roughly equivalent to one planned sector of zone I in Islamabad and is visibly in contrast with the grid iron planning of the sectors by Doxiadis. This population is also being focused for the next phase of development for the expansion of Islamabad. The land use for this zone has been revised and approved by the cabinet division (refer to Table 3). Considering this intention and looking at the settlement through satellite images using Google Earth for the contrasting pattern, three potential settlements were identified for the study: the Malpur in Zone III, Bani gala and Bhara Kahu in zone IV. However, the Bhara Kahu forms the most potential area for the study.

Sampling is done by two methods. Purposive sampling is used and key informants were selected for in-depth interviews and discussions. Second is snow ball sampling for interviews of users. CIT is also intended to be used for cluster sampling for identifying settlements within settlements with seemingly ordered, seemingly disordered and order within disordered patterns occurs.

Table 7 shows the resource persons for data collection is composed of researcher, the planning authority personnel and the residents of both settlements.

Table 7: Resource persons for data collection

	EXPERTS IN FIELD	RESEARCHERS	CAPITAL DEVELOPMENT AUTHORITY	RESIDENTS OF G-6 AND BHARA KAHU
Most relevant to the area of study		Dr. Ahmed Zaib Khan Mahsud Associate Professor Chair Sustainable Architecture & Urbanism Brussels School of Engineering	Ar. Ali Abdullah (Director Architecture) Plnr. Ayub Tariq (Director Housing Societies, Planning Wing)	Area leaders Residents G-6 Residents Bhara Kahu
Topics for query		Islamabad- Doxiadis' legacy- Past, present and future. View of Success of human settlements.	Mapping changes in patterns- Original Master plan and present situation of the planned and unplanned settlements-reasons, gaps, solutions Success of Dynapolis and Ekistics with reference to Islamabad Future of Dynapolis- the planned and the unplanned	Changes in patterns- (past, present and future), Influencing factors , Needs and preferences pertaining to settlements, Cultures of both planned and unplanned settlements- human behaviour and perceptions Ekistics principles (assessment of four principles) Success (in terms of spatial needs satisfaction defined by Ekistics in both human settlements)
Total sample size		1-Discussion	2- Structured interviews	22 respondents- G-6 24 respondents- Bhara Kahu Structured questionnaires for each (planned and unplanned) settlement. 12 respondents - semi-structured in-depth interviews 6 in each (planned and unplanned) settlement

Source: Author

3.4.2 The description of the sample

The respondents were categorized as experts in the field who have been part of Islamabad, the ekistics and Dynapolis research and development. These people consisted of the planners, architects from the CDA planning wing and the residents of the case study areas of G-6 and the Bhara Kahu. Questions for semi structured interviews conducted with the planning experts (Annex-5) were set according to the theme of the research to measure the success of the human settlements in Doxiadis Dynapolis.

The residents were studied to evaluate the relationship between the theory and practice and its implications and relevance in the context. This category is the most relevant in the study to understand the existing situation and measure the success by finding the satisfaction through needs fulfilment identified by the theoretical principles of ekistics. This was done by interactive (semi-structured interviews) (annex-4) and non- interactive communications (questionnaires) Questions for semi structured interviews conducted with the residents and questionnaires were set as per variables and indicators for the research.

The general characteristics of the sample:

The sample from users for the questionnaires consisted of 22 residents from the planned sector of G-6 from zone I and 24 from unplanned settlement of Bhara Kahu from zone IV.

The sample of users who were interviewed was six each from the G-6 and Bhara Kahu. The residents belonged to different socio-economic groups, age groups, education level, tenure of living in the settlement and gender. The mix and maximum variation was picked to understand the needs of a heterogeneous community and evaluate the elements considered important in settlements that promote safety, happiness and satisfaction and ultimately define success of the human settlements.

3.4.2 Validity and Reliability

External validity is checked through the single embedded case studies which enabled to discover and generalize the trends and the factors.

The internal validity is checked through triangulation of data to cross check the findings. The information collected from the residents through in-depth interviews, questionnaires and observation is validated by cross checking the interpretations, results and findings (primary data) with key informants composed of experts in the field of planning. Also the secondary data is used to confirm the findings.

Reliability is checked through the use different instruments and cross checking their validity through triangulation. The process of research is open and transparent. For this purpose a database was prepared for all collected data (interviews, questionnaires and observations etc.) before processing.

3.5 Data Analysis Methods

The research is mainly qualitative (Exploratory, Explanatory and Descriptive in nature) and makes use of the CIT (Critical Incident Technique) for investigative and exploratory purposes. The technique is used in this research for the measurement and analysis of spatial planning. The CIT used mostly communication process (Interactive and Non- interactive) in-depth interviews and questionnaires, to explore opinions about issues, needs, values, perceptions, opinions and judgement of patterns, (material and cognitive), to seek information from the people rather than examining records only, to varying degrees. The CIT is initially used in this study as the identifying tool for the settlement and focuses on specific incidents or unusual or outside of norm for quick identification of problem or even opportunity.

The data analysis focused on the derivation of the following:
- The forces influencing the transformation of patterns and the extent to which they are influential
- The events or processes that have contributed to the shift in material and cognitive patterns
- The evaluation of the outcomes using the principles of Ekistics and
- Potentials, success and problems of the resulting patterns.

The following Table 8 summarises the research methodology and steps taken according to the four stages:

Table 8: Research Methodology

	STAGE 1	STAGE 2	STAGE 3	STAGE 4
	A. PREVIOUS CONTEXT: HISTORY/ BACKGROUND (IMPLEMENTATION YEAR-1960)	**B. MODIFIED CONTEXT:** PRESENT DAY SITUATION (CURRENT YEAR- 2013)	**C. ANALYSIS** THE TRANSFORMATION PROCESS	**D. FUTURE EXPECTATIONS** LESSONS TO BE LEARNED FROM THE TRANSFORMATION PROCESS
STEPS TO BE TAKEN	**A.1.** Background and history of the development of Islamabad master plan, concepts and brief about the theoretical background. **A.2.** Identification of settlements in contrast with the Doxiadis grid iron planning but falling within the jurisdiction of the master plan of Islamabad. The emergent settlements not seen earlier as a potential threat and that evolved alongside the city development. **A.3.** Characterization of the settlements identified as per zones • General characteristics • Physical characteristics/ patterns • Natural and the built fabric • Zone regulations • Intended land use and beneficiaries • Revised land use and beneficiaries	**B.1.** Data collection **B.1.1.**Secondary data What was planned and intended and what is the existing situation and problem? (Newspaper clippings and official documents) **B.1.2** Primary data • Existing situation of settlements (the visible outcomes) • Physical: Site survey, photographic documentation of the area, the physical patterns, services, infrastructure, ekistics unit and level identification. • Sampling design • Clusters of ordered in the seemingly disordered settlements • Identification of key informants • The invisible / softer outcomes • Questionnaire addressed to residents and • In-depth interviews with residents in the settlements	**C.1.** Data Analysis: Explanatory and Descriptive **C.2.** Derivation of the following: • The Forces influencing the transformation of patterns and the extent to which they are influential • The events or processes that have contributed to the shift in material and cognitive patterns • The evaluation of the outcomes using the principles of Ekistics • Potentials, success and problems of the same.	**D.1.** Conclusions and summary of findings. **D.2.** Recommendations on: • Understanding and using the principles of Ekistics for predicting the outcomes in time. • Extending the scope and use of Ekistics to cater to the new forces that have entered the game, while maintaining the unique character of the settlements at micro-settlement level and the city at Meso- settlement level. • Findings of the existing needs, situation, interpretations and explanations. • Maintaining the concept of "Dynapolis" while meeting the needs of today. • Lessons learnt.
METHODS	Literature review. CIT Secondary data collection. Interview of Experts in the field (Government, Academics)	Literature review. Sampling design. CIT, snowball Settlement physical survey Photographic documentation. Semi-structured Interview of key informants Questionnaires from the residents Experts for explanation of situation	Literature review. Comparative analysis Planned Dynapolis vs. Emergent Dynapolis). Planned vs. the unplanned	Literature review.

Source: Author (Adapted from Dr. Alonso Ayala's Lecture/ Presentation, 2013)

Chapter 4: Research Findings and analysis

Introduction

This chapter is divided into three parts: the description of the case study, the research findings and data analysis regarding the research questions of the study.

The section covers the findings through the data collected in the field (secondary and primary data- archival records, site visits, interactive and non-interactive communications, and observations).

4.1 The description of the case study

4.1.1 Physical patterns of the planned and unplanned human settlements

The Islamabad master plan with the grid-iron planned sectors and the National park area without the grid had functions for the areas were clearly defined by Doxiadis.

The national park area was observed to offer many advantages with a variety of landscape features thus was proposed to accommodate all national functions such as sports centre, national university, the national research institutes, the botanical and zoological gardens, national health centre, exhibition grounds, and such agricultural and farming functions which are necessary to serve the capital area including a lake formed by the Rawal Dam and therefore be called semi urban area of Islamabad(CDA, Master Plan Cell- Planning Wing, 1987).

The spatial characteristics of the Sector G-6 (planned human settlement)

The pattern of built fabric

The Sector is divided into four sub sectors like all other sectors. However the sub-sector G-6/1 is further sub divided into smaller modules of four subsectors G-6-1/1, G-6-1/2, G-6-1/3, and G-6-1/4. Regardless of the subdivision of the G-6-1 subsector the basic module remains the same with smaller bazaars and subsector markets with parks, schools, water filtration plants, mosques etc. located around the central areas of the sub sector.

Figure 16 shows the sector G-6 and division of subsectors while figure 17 shows four subdivisions (community class III) of one subsector G-6/1 and sub sector G-6/ 4 (community class IV) with the facilities and road network distribution.

Figure 16: Map G-6

Courtesy: CDA

Figure 17: Part plan Sector G-6 showing sub sectors G-6/1 and G-6/4 (community class IV)

Source: Developed by author

The hierarchy of urban spaces

Right of way of 115 feet along the Fazl-e-Haq road in the north, 160feet -190feet wide in the west along the Seventh Avenue, 375 feet along the Khayaban-e-Suharwardi in the south and 475 feet along the Atta Turk Avenue in the east, forms the largest collection of green areas for the sector. It can be said that the sector is enveloped by the greens that act as transitional space and buffers the sector while addressing the needs of a wider community for a public open space. Other than this the sector has an international park the Argentina Park, community class III, IV and V public parks, mosques, Janazagah and bazaars.

The hierarchy of street systems

The network of the roads and streets of the sectors are hierarchical. The main connection of the number series is connected by avenues with 95 feet wide roads without meridians.

The network of streets follows a similar hierarchical system with the main connections within the bigger community sector with double roads as wide as 100 feet (including central meridian with green belt), single two way 80 feet wide roads (including 15 feet central meridian/ green belt) reducing to 20 feet wide vehicular and finally the ten feet wide pedestrian streets within the subsectors.

The hierarchy of buildings

There is a visible hierarchy in the buildings in the sector G-6. The residential buildings which is the third unit of the Ekistics Logarithmic scale (ELS) and category of minor shells are divided into government and private houses according to size of the plot. The government accommodations have a hierarchy visible through the plot size and design of the house according to the categories corresponding to the grades in government jobs. These are defined through alphabets A-G[2] and distributed in different sub sectors of G-6 (See table 10 for distribution of government and private accommodations in the G-6). The buildings other than residential which are used by a wider range of community are agglomerated along the main roads like the Khayaban-e Suharwardi towards the south in I and T centre called Aabpara or along the Melody market in the markaz (centre) of G-6.

The spatial characteristics of Bhara Kahu (unplanned human settlement)

The pattern of built fabric

An important feature visible in the built fabric is the topography which is revealed by the winding and sloping road networks and the buildings and landscapes at varying levels in the Bhara Kahu.

The growth in Zone-IV of the ICT is characterised by uncontrolled and unplanned expansion which is a result of the multi-ownership system and dual administrative control resulting in weaker law enforcement. The area has improper and insufficient social facilities such as

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[2] The government accommodation is characterised by letters A-G, where A type is for grades 1-5 (plot size 20'x 40') which is the lowest category, B type is for grades 6-9 (plot size 20'x 50'), C type for grades 10-16 (plot size 25'x 40'), D type for grade 17 (plot size 30'x 80'), E type for grade 18 (plot size 50'x 120'), F type for grade 19 (plot size 70'x 120')and G type for grade 20 (plot size 70'x 150'). The H type is for grades 21 and 22 which are the highest grades in the Government of Pakistan but is not present in sector G-6.

schools, colleges, hospitals, graveyards, parks and playgrounds. Another problem identified is the shortage of infrastructure facilities i.e. roads, water supply, sewerage, drainage, etc. Encroachments on nature reserves like Korang River, forests and buffer areas are a common feature. The settlements observed in the area are informal and due to lack of monitoring the area has grown into an uncontrolled and irreparable damage to the city scape as well as the

The hierarchy of urban spaces

The settlement of Bhara Kahu has major concentration of public spaces (markets, commercial centre, health care, bazaars, banks etc.) in the area along the main corridor of Murree road and then reducing down to Simly dam road. The facilities reduce further down to the neighbourhood commercial areas which provide for the residential area around them and keeping the neighbourhood privacy. The transitional spaces provide a hierarchy for the public and private in the settlement.

The hierarchy of street systems

The road network in Bhara Kahu does not show a visible order and does not have avenues but has a distinction very clear in the minds of the locals. The vehicular roads and pedestrian streets however are defined on different levels with major trunk road as Murree road and Simly dam road while vehicular link roads from small neighbourhoods connect with the main roads. The *pagdandian* and *kucha rasta* or the trails provide easy access to the pedestrian traffic to different areas.

The hierarchy of buildings

The hierarchy of residential buildings in Bhara Kahu is evident through various plot size but not clearly defined as in the sector G-6. The houses are from 5 Marla[3], 8 Marla and 10 Marla for the smaller houses and in kanals[4] for the bigger houses. The land which was basically defined for agro farming is in acres[5] and houses of various sizes can be seen in these plots. The land is further divided into different sizes which are not consistent throughout the area as they depend on the wishes of the owners.

The buildings like mosques have a hierarchy defined by the Jamia Masjid[6] in the main areas along the Simly dam road and the Murree road and smaller mosques within the neighbourhoods and streets.

4.2 Presentation of findings in relation to the research question.

The findings regarding the research sub questions 1 and 2 are presented in this section.

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[3] Marla is local unit of space equal to 225 square feet

[4] Kanal is local unit of space equal to 4500 square feet and equal to 20 Marla, 500 square yards

[5] Acre is local unit of space equal to 8 kanals

[6] Jamia Masjid is bigger mosque (place of worship for Muslims) where special Friday prayers are offered. It has a house for the prayer leader, a library and a seminary and can be built double story.

Sub-question 1- How have the physical, social, economic and political processes and events influenced the formation and transformation of the planned and unplanned settlements of Islamabad in time?

4.2.1 Processes and events

The section has tried to look into the minor or major fluctuations in the urban system due to local instabilities coinciding in time. These involve the physical, social, economic and political processes and events reported during the research that have had an influence on the settlements patterns (in physical, social and psychological capacity as these form the important aspects of the Ekistics principles).

Physical processes:

The physical process that was laid out in 1960 for planned settlement G-6 with planning and implementation under the supervision of the consultants Doxiadis Associates has been a major controlling factor in the settlement. Another control factor for the settlement has been the CDA's bye-laws, monitoring and the law enforcement.

The physical patterns of the Bhara Kahu settlement that have emerged as organic are a product of the feudal system, multi-ownership and the land distribution which is also influenced by the strong patriarchal system. The physical processes which are a product of freedom exercised by the citizens in taking charge of their own settlement and shaping it as per their needs, desires and ideas had to be legalized as the authorities could not take control of the situation. The people have freely planned, divided and used the lands (revised the land use), according to their needs, individual and sometimes collective preferences.

Social Processes:

The social system or network that evolved in the sector G-6 as a result of different families brought in to settle together has grown stronger over the years. However the social processes guided by strong traditional and cultural influences are dominant in the region of zone IV Bhara Kahu. The *biradari system* (brotherhood), the *wadera system* (powerful landowner) is the dominant factor responsible for the patterns in the area.

Economic processes:

The economic crisis that has affected peoples' affordability has also affected the settlements of Bhara Kahu and G-6 Sectors. The non-conforming use of the space in both the settlements has increased and informal businesses in the residences have increased, causing encroachments in the area. The land in the Bhara Kahu has been divided into smaller divisions and the agro farming has been replaced by a more profitable substitute of property business.

Political processes:

The political processes have a significant impact on the way the city was initially formed (1960) and later through years has transformed. The ambitions and the intentions of the leaders in power revealed through the focus on different sectors of development.

The ambitious development of the new capital city started by first military President Ayub Khan, in 1958 the same period as pundit Jawaharlal Lal Nehru in India geared for the development of Chandigarh. History shows examples of power architecture and the new towns in case of the newly independent states of India Pakistan reveal power urbanism whereby the leaders of both the countries wanted to show the cities as symbols of modernity, strength and progress and a departure from the unpleasant past in which the two countries had seen war.

The city has seen major changes in the military rules. The Lal masjid built in the 1965 gained power during the third military rule under general Zia-ul Haq's regime (1977-1988) who brought the Islamization and allowed and supported the mosque to strengthen their base against the soviet war in Afghanistan (1979- 1989) and hence over a period between 1965-2006 the Lal masjid took over illegally many lands in the name of religion and constructed mosques and seminaries. Major transformation have occurred in last decade in the rule of fourth military ruler Gen. Musharraf who focused on improving the economic condition of the country by bringing foreign direct investments and focused on improving and enhancing infrastructure for access and improving tourism potential of the city in particular. The development of the major avenues the 7th (between sectors series 6 and 7) and 9th avenues and the Murree Expressway (Bhara Kahu) has provided ease of access to Murree and other northern areas touristic spots in the Margallah Hills, which are a product of his political epoch (1999-2007). However the Lal Masjid operation was also his political agenda which has affected the transformation in the G-6 sector.

Enriching international political ties with other countries like Argentina resulted in a park developed by the Government of Argentina with a monument marked as a symbolic statement of the Pakistan-Argentina friendship for a memorable remembrance (figure 18).

Quality of place is also explained by the physical imprints made by symbolic statements such as objects of remembrances that are accommodated in the place. Two monuments in G-6 *Yaadgaar Chowk*, built in 2008 to commemorate the bomb blast victims which followed a year later of the Lal masjid event. A few yards away is the Argentina Park with the monument built in 1960 symbolizing Pakistan-Argentina friendship. The monument at *Yaadgaar chowk* is located at a significant location in terms of movement networks and reminds people of the unfortunate and unpleasant incident five years ago.

Box 2: Monuments in G-6

Figure 18: Yaadgaar Chowk and
Argentina Park Monument of friendship

Source: Author (2013)

Events:

Events like the Lal Masjid (Red Mosque) operation by the army in 2007 which caused massacre and hence the subsequent aggression and revolt one year later on the same day in 2008 a bomb blast followed. A monument has been erected at the blast site to commemorate the martyrs from the police force leaving a permanent mark of the unpleasant sequence of events. The children's' library disappeared forever in the process of Islamization which was encroached upon by the Lal Masjid women's wing and a University of Islamic studies (Jamia-e Hafsa figure 30 a) was built on the site erasing the children's library which was an important need for the sector for ever. The Jamia Hafsa also however during the Lal masjid operation was bombarded and demolished completely. Three years later in 2010 the Lal Masjid was built again (figure 19 c) but children's Library was never rebuilt.

Figure 19: Events a) Jamia Hafsa G-6 b) Lal Masjid before operation 2007 c) Lal Masjid rebuilt in 2010 d) Margallah Towers 2005

Source: Internet and Newspapers

Many areas are sealed permanently and diversions created which altered the patterns of movement, and disrupted continuity causing inconvenience to the dwellers of the area. Rule for High rise buildings that had been allowed by the bye-laws was revised and a three storey building like the Ambassador hotel from the sixties was demolished due to presence of sensitive offices (intelligence agencies) in the area and fear of terrorist activities.

Apart from that he Lal masjid event has been reported by the residents of the G-6 sector also as having significant impact on the physical, social and psychological patterns of the settlement.

"We never had any sectarian or ethnic differences. We had only one family in the neighbourhood that was Ahle Tashee[7] and never even knew what it meant and every one met every one. It was only a few years ago that the Lal masjid issue spoilt things here. Now people talk about the sects and ethnicity. It has changed a lot."(Male respondent G6-1, July 1, 2013)

The social pattern and cohesion has suffered and psychologically it has made people insecure in the settlement where previously they felt secure. In the process the Lal Masjid and Jamia Hafsa caused much more physical change and loss to public facility of the only children's library in the area. This has been mentioned by five of the six people interviewed from the sector G-6.

"What no one concentrated on was the major loss that the entire sector feels but none has worked towards it is the children's library..." (Male respondent G6-2, July 9, 2013)

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[7] Ahl-e-Tashee are a sect in the Muslims

The massive earth quake of 2005 the remnants of which are visible even today in form of the Margallah Towers in the sector F-10, a posh area in Islamabad has caused a permanent fear of the high-rises in the city. The apartments built in the sector G-6 have not been successful, neither the launched scheme of apartments which were for the low and middle income groups in other areas of Islamabad and the demand for housing lead to revision of land use for zone IV. Another four star hotel that was under construction was cancelled and demolished in the G-6.

4.2.2 The Principles of Ekistics

The section covers the findings related to sub question 2:

How do the principles of Ekistics help in assessing the formation and transformation of patterns in the planned and the unplanned settlements in time?

4.2.2.1 Principle 1

(Maximization of man's potential contacts with the elements of nature such as water and trees, with other people, and with the works of man such as buildings and roads)

Existence and frequency of contacts with respect to both settlements were seen for this principle. A photographic documentation supports and validates such information.

Sector G-6

Contact with Nature

Existence of contacts with nature:

The area consists of nala (storm water channel) which runs through the whole sector at various places in sub sectors G-6/ 1, G-6/2, G-6/3 and G-6/4. These nalas are considered to be nature reserve by the community and have been important recreation and entertainment for children in the past. The wooded areas and a few parks like the Jasmine and Rose gardens although identified by the community are technically out of the sector boundary but within the range of two kilometre distance for the sub sectors G-6/ 1 and G-6/4 which face the Khayaban-e Suharwardi. Similarly, Rawal Lake was identified as nature reserve in the area which again is out of the boundary of G-6.

The area has a fair distribution of parks and green belts in the sector G-6 and serves all community classes. The green belts along the avenues form the largest green areas and used as public open spaces. The right of way is also lined with trees and is protected by the bye laws.

Figure 20: Different levels of public and community class III- V parks

a) Garden G-6/4 b) Argentina Park G-6/2 developed in1960s c) community park, G-6- The shaded street with ROW with mandatory protection of trees protected by law

Source: Author (2013)

Table 9: Distribution of facilities in sector G-6 and its sub sectors

Sector G-6 Contacts	Quantity existing 2013	Distribution					
		G-6/1	G-6/2	G-6/3	G-6/4	Markaz	I & T centre
Housing Units (Government)	3956	2056	1330	90	480	NA	NA
Housing Units (Private)	837	338	200	126	173	NA	NA
Open spaces, road, parking		Y	Y	Y	Y	Y	Y
Car parking in commercial area	10	4	3	1	2	Y	Y
Organized open spaces/ parks	12	4	2	3	3	Y	
Organized open spaces- hubs	73	23	18	11	21		
Nature		1	1	2			N
Play grounds	11	4	2	2	3	N	N
Incidental open space							
Planned Primary institution	9	4	3	1	1	N	N
Secondary	5	1	2	1	1	N	N
Tertiary /Colleges	2	-	1	1	-	N	N
Mosques	17	5	5	1	5	1	
Janazagah	5	3	1	-	1	N	N
Govt. Health institutions	7	4	3	-	-		N
Bazaars	8	4	3	0	1		
Markets		5	1	0	1		
Clubs	2	1	-	-	1		N
Community centres	1	-	-	-	1		N
Cinema	1	-	-	-	-	1	N
Food park	1	-	-	-	-	1	
Hotel (4 Star)	1					1	N
Restaurants						Many	Y
GPO/ Post office	5	1	1	-	1	1	Y
GTS	1	-	-	-	-	1	N
Taxi stand	5	1	1	1	1	1	Y
Police station	1	-	-	-	-	1	N

Source: Developed by Author

Courtesy: Information CDA

Contact with other people:

Existence of Public space for social interaction:

The sector has a unique planning feature that is much appreciated by the residents of the area in form of especially designed public spaces of social interaction termed as hubs (figure 21) shows different hubs in G-6 by the residents. These spaces have been widely used according to the residents and have provided the option for a much convenient and regular social interaction (See box 3).

These hubs are located in every street of the sub sectors and after every ten to fifteen houses depending on the type of house. They are restricted from commercial activity use and sale purchase and are strictly for the use of the residents only.

Figure 21: The Gossip squares of G- 6- Places of social interaction

Source: Author (2013)

Places of social interaction- "**Gossip squares**" of sector G-6- A feature that is multipurpose and intensively used by the residents and has been a very productive space that has developed a culture of enhanced social network providing the community with an enhanced sense of protection in the area. These squares were, are and always will be a requirement of this culture and making them a part of a well thought of design of community space has been much appreciated by the users. These gossip squares are an integrated social space found in the planning of Baghdad also by Dr. Doxiadis.

Apart from the gossip squares "**chai khana**" (tea houses) or cafes form an important part of the G-6 sector as places of social interaction. The cafes (chai khana) were added as an important need in the center of the sector and sub-sectors. The chai khana in the covered market was perceived to be one such place of social interaction in the past which came from an older tradition but with a modern touch for the people of the area in 1960.

Box 3: G- 6 places of social interaction

"There are small voids like empty plots in the entire sector. These are very nice places for social interaction and I have never seen them without people in my whole life….many people go to parks too…." (Male Respondent G6-1, July 1, 2013)

The residents also identified the other places of social interaction such as the *khokay*/ Kiosks, *masjid* / mosques, courtyards in the bazaar (market community class III) in sub sectors and

even parks, road sides and the green belts in the sector (figure 22). For men sharing similar activities provide opportunity for social interaction too like sports complex which is not within the sector but due to easy access is used extensively by the residents of the research area. However one thing the male respondents mentioned about these public places are that these are places of social interaction for the male members of the society and the places for social interaction for women are the houses and an exclusive ladies park. This is taken as an understood norm of the social culture.

"Women obviously do not go out they meet women at home only. Although there is a ladies park and I think it is the only park in Islamabad specifically for ladies and enclosed also where some women go." (Male Respondent G6-1, July 1, 2013)

Figure 22: Public open spaces as places of social interaction

The female interviewees however reported visiting parks, parlours and shopping centres as activities that provide social interaction.

"We the women find a reason to meet like going shopping together or parlour or even to the parks…"(Female Respondent G6-3, July 3, 2013)

Contact with the works of man (Places of need/ perceived value):

Existence of markets, schools, places of worship etc.:

The sector has a rich mix of opportunities for contact with various levels of commercial activity. The commercial and public facilities are provided at different community class level and to provide sufficient distribution has been calculated per inhabitants (refer to table 9).

"Everything needed is available in our area. No particular thing is missing I think. No other sector has everything like in G-6…… the melody market is a very well equipped market for all kinds of facilities from banks to restaurants, stationary, grocery, photocopier and printing facilities, Food Park, cinema, GPO (General Post Office) etc." (Male Respondent G6-1, July 1, 2013)

The sector has all major and minor places of need in community classes with major facilities for community class V agglomerated at the Melody Markaz and the periphery in the I &T centre or Aabpara market. The location is more central and more accessible (along major road network) and caters to a wider community class V (the sector) scale and for greater than class V (outside/ greater than sector) in case of the Aabpara market and I&T center which is an externalized facility.

The public places like mosques, parks, khokay, and cafes provided are important as places of social interaction as well. These facilities are grouped in all subsectors and form centralized clusters of mosques (sometimes with Janazagah), park, bazaar with eight shops and a public

open space with café. Figure 23 shows typical bazaar which is provided in community class III. The design is typical and followed for all bazaars located in different sub sectors. Pictures shows Bazaar number 8 currently been used by CDA offices with residential quarters on first floor accessed from back side. The forecourt provides access with a public open space and parking space shaded by trees. The purpose of this open space is also to provide a place for social interaction. The 10'x10' khokay or kiosks are distributed in the entire sector and provide for the needs of people in addition to the markets and bazaars in the sector.

Figure 23: Bazaars Community class III

Source: Author (2013)

The different mosques in the area provide for a variety of communal groups and sects in the sector and also are places of regular social interaction as observed.

Other places of perceived value are the health care facilities like dispensaries and hospitals, educational and academic institutes, police station, General post office and water filtration plants (Annex-6) which are also distributed in the sector. The sector has two major government hospitals- the Capital hospital (Annex-6) and the Federal Government Polyclinic institute (Annex-6), one of the oldest and best school- the ICB. The markaz has a cinema which is no more functional.

Figure 24: Different levels of housing units in sub sectors of G-6

Source: Author (2013)

Figure 24 shows the different housing in the sector. The sector consists of government accommodation which are categorized hierarchically from A- G type (see footnote 2) with the concentration of A-C types in G-6/1, G-6/2 only, D type in G-6/1, G-6/2 and G-6/4 only, E type in G-6/2 and G-6/4 only and F type in subsector G-6/3 and G-6/4 only and G type in

G-6/3 only. There is a total concentration of government accommodations comprising of 3956 units (see table 9 for distribution of housing units in the subsectors).

The rest are private accommodations with 837 units.

Water filtration plants are located in each sub-sector which provides people with clean drinking water. However, some facilities were dysfunctional.

Figure 25: Play grounds- a) G-6 community ground in green belt on Ataturk avenue b & c) Public School play grounds used as community grounds

Source: Author (2013)

The community play grounds in the sector are found in green belts and some are shared facilities between schools and the public (figure 25). There were two grounds provided for cricket, hockey and football each earlier along the green belt where now Seventh Avenue has been constructed.

Frequency of contact (primary, secondary and tertiary)

The research revealed that the existence of contacts does not necessarily confirm a high frequency of contact too. Here the respondents identified reasons for the frequency of contact while answering if the contacts were maintained or not. For example:

"We doubt the quality of water (supplied by the filtration plants) and don't ever go to the (water filtration) plants for water; there have been much news also. Recently people responsible for the filtration plants were suspended and it was reported that the quality was not fit for drinking purposes." (Male Respondent G6-5, July 8, 2013)

Similarly female respondents accepted going to the parks sometimes while the male respondents said the women do not go out.
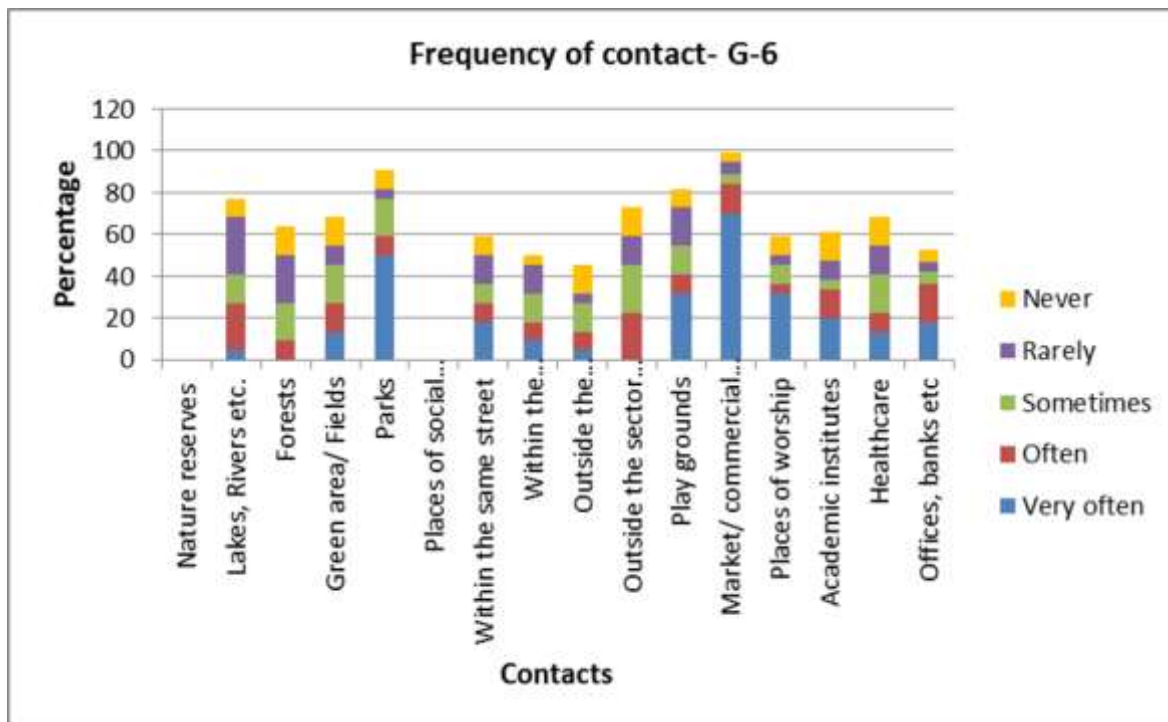
Chart 1: Frequency of contact G-6

Source: Author

Bhara Kahu

Existence of contacts (primary, secondary and tertiary)

The settlement does not have clearly marked plans to show clear signs of availability and existence of contacts. However, the existence was physically seen in the field through and observations. These were documented in the form of photographs and interviews as well as questionnaires.

Contact with Nature:

Existence of nature:

The Zone IV is part of the National Park area that has nature reserves that provide the Islamabad with an escape from the pressure of the city life. The area has natural springs, rivers, pasture lands and agro farms that are a unique characteristic of the area. The Korang River flows through many areas winding along in the Bhara Kahu. Other nature reserves in the area of high value to the residents and hence highlighted are the Simly dam, Shadra, Rawal lake and the greenery around in form of open green fields and the mountains surrounding the area. However the Rawal Lake does not fall in the Bhara Kahu area but has been mentioned due to close proximity to the lake. Figure 26 shows the views of nature which is appreciated due to natural form. The Korang River remains a unique identifying feature for the Bhara Kahu.

Figure 26: Nature and views in the Bhara Kahu- a) view of Bhara Kahu before bridge, b) Korang Nala and the settlement alongside c) open green fields d) Korang River bank

Source: Author 2013

Contact with other people:

Existence of public spaces for social interaction:

Bhara Kahu has a typical regional culture characterised by the biradari system. The area has "*dhabay*" (Figure 27, Box 4) along the main roads which are mostly covered by trees and form favourite and convenient places of social interaction for the "male" locals of the society.

Box 4: Bhara Kahu- Places of social interaction

Bhara Kahu Places of social interaction- **"Dhabay"** or small roadside restaurants where people chit chat while enjoying traditional *huqqah* (smoking pipe) on *charpai* (hand woven beds) mostly under thatched or corrugated sheet roofs or under shades of trees. This is a common culture and has been replicated in the modern culture with cafes or *chai khana* (Tea House) which serve the *sheesha* (Smoking pipe with water and flavored coal) in similar environment and are the most popular places of social interaction for youth.

Figure 27: Bhara Kahu- Dhabay- Places of social interaction in a traditional culture

Source: Author (2013)

The old locals of the area living there for generations had a sense of vast areas of land available for social interaction due to biradari spread over vast area. According to the respondents the biradari have as many as hundred to three hundred houses in the area.

"We have so many houses we can go anywhere in the area and socialize.....There are about a group of seven to eight villages of our family/ biradari with 300 houses in the locality belonging to my biradari (family) ....We have land for farming and that is also a way we interact." (Male respondent BK-1, July 8, 2013)

Places of social interaction are plenty for the men but are limited for women and the small businesses or the houses of relatives and neighbours in the area serve for the purpose of interaction.

"Men meet just anywhere. There is no problem for the men anywhere in the world. Although there are no facilities in the area for women and children but women have small businesses

like someone has opened a parlour and some sell clothes etc. so that gives us a reason to visit them frequently. (Female Respondent BK-4, July 8, 2013)

Contact with the work of man

<u>Existence of markets, schools, places of worship etc.:</u>

The major public facilities like the commercial area, markets, mosques, academic/ educational institutes, healthcare, police station, are concentrated along the main roads (Murree road and Simly dam road). The area has arrangement for weekly market on Wednesdays (Budh bazaar) which is a subsidized open market (Annex 6).

However, some public facilities that serve large numbers but are characterised by a lower degree of public space in terms they correspond to certain communities are located in the neighbourhood's central places and streets like private schools, clinics and mosques. Smaller markets are also located in the neighbourhoods with *parchoon* and *rashan* centres (utility stores).

Another facility pointed out by key person in the area is the availability of facilities at the doorstep in form of *rerhi walay* (push cart) and sabzi or *phul walay* (vegetable and fruit sellers).

"Everything is there. Mosques, schools, markets, hotel everything is here". (Male respondent BK-1, July 8, 2013)

"Lately all famous stores, bakeries, banks, super markets, chemists etc. have been added to Bhara Kahu in the main commercial area on the Murree road. This is a great facility for the residents here so we do not need to go to Islamabad for the same. Mosques are situated in all areas in Bhara Kahu. A very big park at the Rawal lake is situated close by. The quality educational institutions like Bahria College on the main Simly road and the international Islamic university on Murree road are in addition to the government schools and other private schools in the houses. The hospitals and clinics are on the main Murree road as well as the neighbourhoods…… Most needs are fulfilled in the neighbourhood shops and rest in the main commercial area along the Murree road and the Simly road." (Male respondent BK-2, July 5, 2013)

<u>Frequency of contact</u>

The frequency of contact

Chart 2: Frequency of contact Bhara Kahu
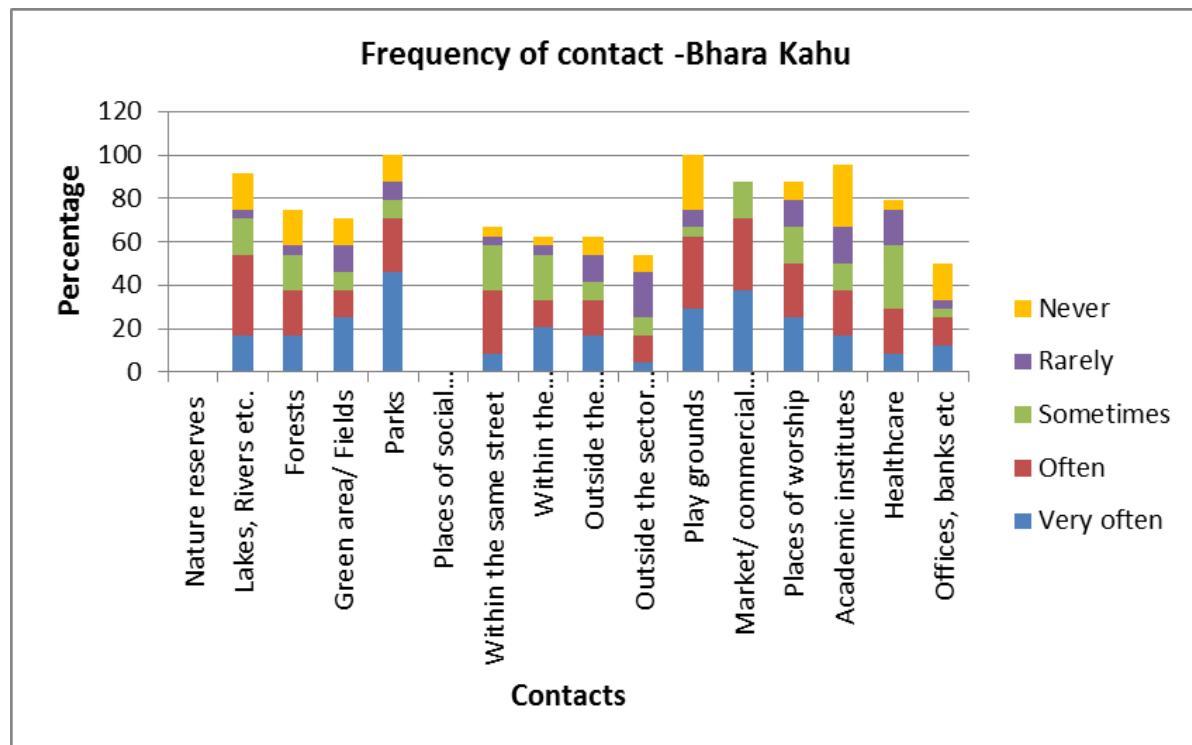
Source: Author

4.2.2.2 Principle 2

Minimization of the effort required for the achievement of man's actual and potential contacts. He always gives his structures the shape, or selects the route, that requires the minimum effort.

The distances, ease of access, modes and time to access the contacts were seen for this principle in G-6 and Bhara Kahu.

Sector G-6

Effort for contact with nature:

Distance, ease of access, modes and time to access nature:

The avenue runs between 175 feet wide green belts on either side which are also used as extensions of the greens provided within the sectors and the sub sectors. These greens are accessible as they fall within the two kilometre boundary of the sector. The parks are also falling within half a kilometre for the community class III, and maximum of one kilometre for the community class IV. However, other identified areas of nature by the respondents like the wooded area and Rose and Jasmine gardens also fall within easy access of two kilometres range for people residing in subsectors G-6/1 and G-6/4. The Rawal Lake however is farther away but due to preference of use and easy accessibility with transport is considered contact.

Figure 28: Sector G-6 Access and connectivity- Seventh Avenue from a bridge connecting sectors G-7 and G-6 leading to main Saddar road running at centre of G-6

Source: Author (2013)

The survey showed the residents of G-6 mostly accessed the parks within the sector by walking. It is only by choice that they use private transport for accessing the parks within the neighborhood. Out of six interviewees all accepted the easy access to all parks and green areas (including green belts) within the sector by walking which takes a maximum time of ten minutes. However the respondents also mentioned Rose and Jasmine gardens which are outside sector to be within walkable distance but due to increased traffic on the avenues in between they preferred using public or private transport now which takes ten minutes.

"The jungles near the rose and jasmine gardens and the Rawal Lake are nearest natural areas….Mostly we access it by car which takes around ten minutes" (Male Respondent G6-1, July 1, 2013)

Effort for contact with other people:

Distance, ease of access, modes and time to access places of social interaction:

The G-6 sector has voids designed specially as community space for social interaction and this turns out to be multiple use space, for gatherings at different occasions like weddings, funerals, play area and evening gatherings. These spaces or hubs created especially for the residents have been used by all age male members of the society. These hubs termed as the "gossip squares" after every ten to fifteen houses (Mahsud, 2010) are used extensively even today after fifty three years and have replaced the generation of users.

"The hubs are in all streets and even the khokay and parks are within five minutes walking distance…. People walk to these places unless they want to use the facilities of some other sub sector." (Respondent 1, July 1, 2013)

"...I mostly prefer meeting my friends at my friend's khoka and since all the people in the neighbourhood buy small daily items like eggs and bread from there as it is at walking distance for everyone in our locality we get to say hello to them also." (Male Respondent G6-5, male, July 8, 2013)

All the points of interaction (parks, mosques, gossip square, green areas, *khokay* (kiosks) are located at very comfortable walking distance within ten minutes.

Effort for contact with the work of man:

Distance, ease of access, modes and time to access works of man:

The infrastructure in the sector G-6 is hierarchical with the avenues providing connection between 6 and 7 series on one side and 5 and 6 series on the other. Figure 28 shows the Seventh Avenue built in year 2007. These avenues are part of Doxiadis plan which were not implemented as in the 1960 it was thought they were not needed. The ease of accessibility is provided by van stops at various locations in the sector and pedestrian, motor bike and bicycle bridge connecting the G-6 and G-7 sectors.

The field survey showed all major and minor contacts within the sector for example commercial areas, markets, mosques, academic institutes, healthcare, water filtration plants to be at an easy accessible walking distance and this was affirmed by the respondents. People, who rely on access to free filtered drinking water, access the water plants located in each subsector within half to one kilometer that provides citizens clean drinking water by walking or even in private transport. Play grounds and parks are located in each subsector and fall within half to one kilometer walking distance. People access these facilities by walking. The markaz called Melody market is located at approximately one kilometer from the external boundary of the sector, hence easily accessible by walk for the residents of all subsectors.

"Melody market is more convenient as it is in the centre ….Other than this there are cooperative markets called the bazaars in the each subsector which are the closest and the most convenient like within two to five minutes walking distance…." (Male Respondent G6-1, July 1, 2013)

Other smaller bazaars or mini markets are available at the central locations of the subsectors approximately half a kilometer distance at the most at two minutes walking distance. Apart from this there are small kiosks located in the sub sectors, and the informal rerhis (stalls and carts), which provide sufficient and convenient facilities.

Mosques are located with every mini market or bazaar of the sub sector apart from other mosques in the streets and major mosques like the Lal masjid (red mosque).

The sector has been planned on a 2 X 2 kilometer grid which allows easy access to people to all the public places within the sector. People reported they mostly walked to the places within the subsector as they were usually at shorter distances within two to three minutes' walk but sometimes used private transport to go to the markaz or I &T center and the Aabpara market although the maximum time to access by walking is within ten minutes.

The survey showed the residents of G-6 mostly accessed the parks, schools, mosques, markets and places of social interaction by walking. It is only by choice that they use private transport for contacts within the neighborhood. Out of six interviewees all accepted the easy access to all places of need by walking.

"Everything is near here and everyone can walk up to whatever one would need…..We mostly walk to the bazaars as the distances are too short to go there in the car." (Male Respondent G6-1, July 1, 2013)

Bhara Kahu

Effort for contact with nature:

Distance, ease of access modes and time to access nature:

The people who do not own a transport mostly either walk using the *pagdandian*[8] (trails) or use the public transport inform of the Suzuki pickup easily available in the area. The people who own transport had a different point of view and the distance seemed to be shorter for them for even Islamabad and thus preferred visiting parks in zone I and even lake in zone III.

Effort for contact with other people:

Distance, ease of access, modes and time to access places of social interaction:

The places of social interaction for the male members of the society *dhabay* are located along the main routes on the Simly dam road and are easily accessible by walk. Family homes and land are also venues for social interaction within the settlement. The social interaction for women takes place within an easy distance of a few streets within the neighbourhood.

"...women have small businesses like someone has opened a parlour and some sell clothes etc. so that gives us a reason to visit them frequently. It is just within our own mohalla/ neighbourhood and mostly two three streets around."(Female respondent 4, July 8, 2013)

People mostly walk to the places of social interaction in the neighborhood like the dhabay and the women also walk to the places which are within ten minutes walking distance.

Effort for contact with the work of man (Places):

Distance, ease of access, modes and time to access works of man:

The main commercial area has markets, banks, health care, academic institutes, mosques and stretches far along the Murree road and Simly dam road is within two to three kilometers and is easily accessible with public and private transport. However the commercial area has

"Dispensaries and hospitals are there but we use the government facility that doesn't charge. There is a hospital from the health directorate very far away in Bhara Kahu. This is within two kilometres distance". (Male respondent BK-1, July 8, 2013)

The modes of transport commonly available in the area and used are public transport in form of Suzuki pick up vans. The people with private transport use it to commute to the markets in the main commercial areas, banks, healthcare (Murree road and Simly dam road). For the smaller markets or bazaars mostly in the neighborhood people walk to the places.

"If I need to go to the market I use the shops close by which I can walk to like within two three minutes. The men in my family like my son or father go to the main commercial area for shopping mostly."(Female respondent 4, July 8, 2013)

4.2.2.3 Principle 3

(Optimization of man's protective space, which means the selection of such a distance from other persons, animals, or objects that he can keep his contacts with them (first principle) without any kind of sensory or psychological discomfort)

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[8] *Pagdandian* are local system of trails providing interconnection usually through the neighbourhoods for shorter distances

This principle required measurement of perceptions of safety for which awareness with the environment, perception of safe distance for self and for other members of the family and the distribution of private and public space were seen for G-6 and Bhara Kahu.

Sector G-6

Awareness of the environment

Four out of six people interviewed for this research are old residents of the sector, some even born and brought up here. The fact that they have lived here for so long and went to schools and shared activities in the same neighborhood, their awareness and sense of security is increased many folds. The awareness of the neighborhood physically and people is what defines their protective space in the neighborhood. For example a respondent reported:

"We have lived here for the past four to five decades. We know the place and the people. There was nothing to be afraid of. Even the neighbours would watch children and report if something needed attention. But yes over past few years new people have moved in and maybe we are more careful now." (Respondent 2, G-6, July 9, 2013)

Another respondent reported in a similar manner,

"I have been brought up here and am very comfortable in this area. We know many people and all places. I think if one knows his surroundings well it makes them feel secure." (Respondent 5, G-6, July 8, 2013)

The survey also revealed that the awareness of the environment and social network provided a much more reliable concept of protective space and reduced reliance on surveillance or security institutions. The sharing of responsibility of protection is another feature identified.

"There is no special surveillance system but people know each other and apart from that if they have watchmen they also keep an eye on suspicious activity". (Respondent 1, G-6, July 1, 2013)

"We don't have surveillance but we have not even felt the need". (Respondent 2, G-6, July 9, 2013)

However informal surveillance availability is also reported in the area in form of *chowkidaar*[9] and is appreciated as it provides a psychological relief to the residents.

"There is a chowkidaar coming every night around midnight and whistles while going on cycle. He crosses every street whistling and that man is paid Rs10- 20 by each house. He is hired by nobody but people pay him because his whistle is a great relief that someone is out there watching." (Respondent 2, G-6, July 9, 2013)

The awareness is also transferred to new settlers in the area by (social networks) people who already know the surroundings and thus the experiences of safety. Similarly it is observed that moving around independently and in company makes differences in the space perception. In an interview with a private hostel warden her observations of the new comers to the area and their safety perception is recorded as:

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[9] Chowkidaar: watchman

"These girls are very bold and when they come and make friends here they take them and introduce them to the places like the tailors etc. since they mostly go out in groups they do not fear neither do I." (Female Respondent 4, July 10, 2013)

Many respondents have pointed out the feeling of safety in groups including female respondents.

"We used to walk to the school and were never accompanied by our parents. All children in the streets in our neighbourhood were friends and used to walk together to school." (Female Respondent 3, G-6, July 3, 2013)

The perception of safe distance for self and other members of the family

The following statements are from female respondents who being aware of the social issue of harassment have a strategy for dealing with the situation in order to protect themselves.

"Knowing the girls belong to hostel is always a problem. There are harassment cases too. But the girls need to take care of themselves and not attract people too." (Female Respondent 4, G-6, July 10, 2013)

"For women of course things are a bit different in our culture. But knowing the environment one takes care of how to dress when going out and I never had problems earlier or even now but still there is some difference." (Respondent 3, G-6, July 3, 2013)

The solution to this is also seen in the settlement and also identified by the residents themselves. Provision of facilities exclusively for the user group which has otherwise limited options available is a solution for example the provision of Ladies Park in the G-6 sector.

"Women obviously do not go out they meet women at home only. Although there is a ladies park and I think it is the only park in Islamabad specifically for ladies and enclosed also where some women go." (Respondent 1 G-6, July 1, 2013)

A female respondent also pointed this out,

"We have a ladies park here which is more comfortable to go to. Other parks are open and then men come and stare at the women which make them uncomfortable." (Respondent 3 G-6, July 3, 2013)

The distribution of the personal, private, and public space

The sector has facilitated the users/ residents in definition of the private and public space with the existing hierarchical distribution of spaces. Another feature of the distribution of space is the social parameters for the gender and age by accepted norms of the masses in the society. The hierarchy and the grid have provided physical security and safety.

"See when there are straight roads I know there is no one hiding as I would feel in an area with haphazard or curvilinear roads. That is one big factor that is generating that feeling of safety here….. Crime is negligible and we feel safe here" (Male Respondent 1, July 1, 2013)

"Crime is almost negligible here." (Male Respondent 2, July 9, 2013)

"You must have noticed there are houses which don't even have a boundary wall and open directly into the streets. And even some houses here that have some open space inside don't even have a boundary wall they just have a hedge". (Male Respondent 1, July 1, 2013)

".....my brother has children and we are really careful that they don't go far if they are playing outdoors they have to be in front of the house where they can be watched…"(female Respondent 3,G-6, July 3, 2013)

It is apparent that people visual contact of the area aids feeling of security.

Bhara Kahu

Awareness of the environment

The respondents were mostly aware of the environment and the safety issues but somehow hesitated and resisted volunteering information on the subject. The survey through open ended questionnaires revealed complete reluctance on answering questions regarding experiencing or even knowledge of issues related to harassment, drugs, and use of arms in the area. The majority answered with vague statements like *"police is there to take care of such things"*, *"police is there to take care of such things"* and *"we will report it to police"*. However, after the recent (August 9, 2013) incident of terrorist attack on a mosque, the media revealed the police to be irresponsive in the case and people showed discontent with the security in the area. However two of the interviewees who were not locals of the area revealed the sensitivity regarding the subject and said it was an unspoken but accepted culture. The use of ammunition and *naswaar*[10] (a kind of drug) is a common thing in the locality.

"People here as in the locals mostly all have ammunition with them. It is a common feature or say it is the culture here. A friend of mine was visiting me and took me to his friend's farm house also in Bhara Kahu. The host as a gesture of hospitality said let's make you enjoy firing and gave us guns to fire in the air. It was surprising as no one in the area is bothered by such acts. It is considered chivalry to be able to have a good shot and they use firing as an indication of celebration too… The pathans in the area use "naswaar" which is easily available here. There are dacoits also in the area but they do not bother the locals. All these are a matter of routine for the locals here who have been living through generations here." (Male respondent 2, July 5, 2013)

"..I have heard about groups of dacoits residing in the area and have heard gun shots quite a few times. But I don't know about drugs although there is a trend of using naswaar a lot which is also a type of nasha/ addiction…. This is one thing that is not very comfortable for me as my friends and cousin are also not very comfortable visiting me and have often mentioned if God forbid something happens nobody can reach in time. For this they have criticised my choice of living here a lot. As far as the question of feeling safe and secure is concerned the place is not at all considered safe for females living alone like me but I guess

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[10] Naswaar is an intoxicant, addictive drug prepared with tobacco, mud and cannabis plant leaves ground together.

I'm very bold, have lived here on my own and feel quite safe because of the background I have."(Female respondent 3, July 5, 2013)

It was also reported that cases of non-criminal nature were resolved through the area leader called *"Saalsi"* who was most respectable in the neighbourhood and his verdict was obeyed.

"There is much stronger social backup system in the area even more than in urban area. Urban areas have police station. In this area people go to saalsi first. If two groups had a fight, even in marriages they are dealt with at this level. Saalsi has a baithak[11] an upgraded panchayat system[12] who resolve issues through the informal court system but this is obeyed and accepted by a vast majority and is backed by the area SHO. From the basic problems starting within the house, whether marital problem, social problems, shops or land and street fights, etc. all non-criminal act issues. There is no conflict or doubt about this system which is very authentic and known fact."(Male respondent 2, July 5, 2013)

The awareness of the local culture in terms of norms related to image and parameters for women is one more thing defining the comfort level in the females.

"Although I do not really care or get bothered by it but it is a fact that the people of this area have a different mentality. They see a working woman and a woman who drives alone differently. This is something typical of our people in smaller towns so I understand and know the culture." (Female respondent 3, July 5, 2013)

<u>The perception of safe distance for self and for other members of the family</u>

The locality of Bhara Kahu mostly consists of large biradari spreading over a hundred to three hundred houses in the area. The perception of safe distance and scale hence spreads to the limits of the biradari for the locals of the area. The people although have a vast area which they consider safe but have a protective space defined by the male dominating system for the females of the biradari like in the G-6 sector. Local's perception of safe distance for self and family and need for surveillance was explained as:

"Oh yes our area is very safe. It is our own village why would we not feel safe...There is no system of chowkidaar and we do not need one. We trust our Lord and leave it to Him... The children know the area and the people and the people also know us so there is no problem. The children go to school on their own and play in the streets or lands..." (Male respondent 1, July 8, 2013)

However, the perception of safe distance is different for the people who are not the locals and they defined the boundaries of safe distance for the members of the family mostly the women and children. One female respondent (interviewee) reported that she felt safe in the area though they were not the locals but since her children grew in the area the safe distance extended to the boundaries of the neighbourhood.

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[11] Baithak is a place for social interaction usually for meeting male members. It a kind of a drawing room normally with a direct entrance from outside to avoid interaction with females.

[12] Panchayat is local system of court

"I feel safe there is no problem in our area. We have been living here for the past nineteen years and never encountered any problems… and feel I can survive alone also here…. Our gates remain open we have never felt the need for surveillance… They (my children) have grown up here so they have always been comfortable in the area and can go anywhere. In fact they used to fetch groceries also for the home since they were young…." (Female respondent 4, July 8, 2013)

People who are not locals have reported absence of system of surveillance in the area and mostly have hired chowkidaar or staff for protection on personal level who do not perceive safe distance beyond their dwelling. A female respondent though had a safety perception for herself however defined the safe distance for her child to be within a close range with her.

"I have a full time servant for my safety that belongs to my hometown…. I would never let my daughter out of sight. Letting her out in the neighbourhood is out of question. Even though I have a full time maid hired especially for her…. and I even take her to my work place."(Female respondent 3, July 5, 2013)

A male respondent who is not a local and has been living in the settlement for the past eight years had a similar perception about safety for the locals and his family and said;

"..Everyone is responsible for their own safety…Safety for children of the locals is much more as they can go far away to different neighbourhoods by themselves. But the new residents who have migrated from some other area, their children do not go far may be not even out…..We do not let our son out alone. If most then just to the shops along the same road but not even that too often… I do not have any problem with moving around but would not be comfortable with my wife or son moving in the area by them. You will hardly see women in the markets or moving around..." (Male respondent 2, July 5, 2013)

The distribution of the personal, private, and public space

The people have defined and distributed the private and public space according to the norms prevailing in the feudal culture in the area. The private space however extends to the large family area occupied in the settlement. This area is defined as the private space and "allowable" space/ area for social interaction for the females of the family too. The comfort level for children (male) however extends beyond the houses and they like any male member of the family can access comfortably the broader neighbourhood. The private comfort space is protected by walls higher than regular five feet height for privacy from public (roadside) and neighbours who do not belong to the same biradari.

In response to question on safety *"Do you feel safe and secure in your settlement?"* which was asked through questionnaires from both the settlements 91 % from the G-6 said they felt safe in their neighbourhood. While 75% from Bhara Kahu replied they felt safe. None of the respondents from G-6 said they did not feel safe. However 25 % from Bhara Kahu said they did not feel safe in the settlement and these mostly were non-locals. Table 10 and chart 3 below give an overview of the findings from survey of both the settlements.

Table 10: Feeling of safety in the settlement

Feeling of safety in settlement	Sector G-6	%	Bhara Kahu	%
Yes	20	91	18	75
Neutral	1	5	0	0
No	0	0	6	25

Chart 3: Feeling of safety for the residents within G-6 and Bhara Kahu
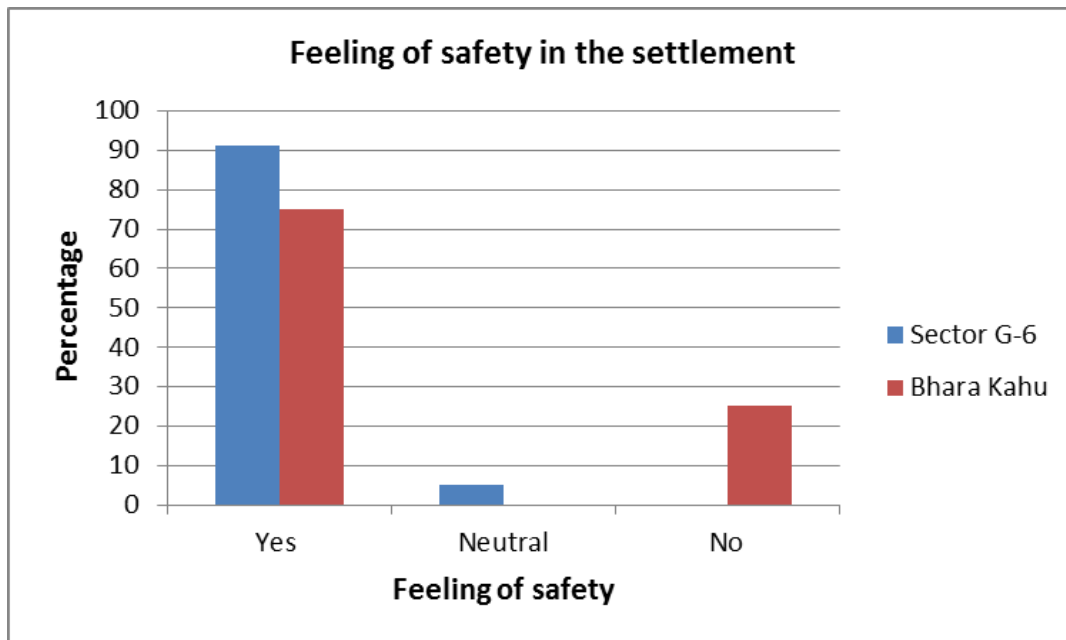
Source: Aurthor 2013

4.2.2.4 Principle 4

(Optimization of the quality of man's relationship with his environment, which consists of nature, society, shells (buildings and houses of all sorts), and networks ranging from roads to telecommunications)

The quality of relationship for this principle was seen through the connectivity (physical, social and psychological), the influences and uses of contacts etc.

Sector G-6

Quality of relationship of man and nature

The connectivity between elements of nature and man:

The nature which is mostly planned and cultivated now in the sector G-6 is all appreciated, admired by the residents and protected by the Capital Development Authority's Environment Directorate. The neighbourhood at all levels (community classes) have green spaces available and green belts and right of way is also used as extension of the private green space.

Influences:

Nature has been the most appreciated feature of Islamabad. The sector has well distributed greens with parks and 300-400 feet wide green belts that are used as an extension of the greens outside the basic unit. The area has shaded streets with oldest trees in the neighbourhood that have been preserved by the strict regulations of the CDA.

"The natural woods have reduced while the cultivated have increased but whatever the case may be Islamabad is known for the greens." (Male Respondent 1, July 1, 2013)

"The wide green belts along the avenues are also a source of pleasure to the eyes. I feel refreshed and this is why I go hiking in the trails on the Margallah hills." (Male Respondent 2, July 9, 2013)

Use of green spaces, water bodies etc.:

The wider green belts along the outer boundary of the sector towards the Seventh Avenue and the Atta-Turk avenue are used as buffers and social public areas and have also improved the micro climate of the area. The older houses (with allowed boundary walls) have green hedges as the boundary walls. Houses that do not have boundary walls with doors opening directly on streets use hedges as green screens and creating semi-public and semi-private areas.

Figure 29: Influences- Use of nature

"There was a storm water stream which we used to call a spring and play in that sometimes in the summers even catch fish in it….. The nalay used to be clean once….the green belts also serve as parks for many people and you will see a lot of people on the green belts spending evenings and enjoying the weather or beating the heat along the seventh avenue and the Atta Turk avenue or the Khayaban-e-Suharwardi" (Male Respondent 1, July 1, 2013)

The greens of Islamabad in general are a unique lasting impression of the city which people are conscious of and consciously choose to have a physical and visual contact with the nature. There is a conscious effort to protect the greens of the developed sectors and the conservation has been appreciated and respected widely.

"The view of Margallah is the best view from almost all areas of the city" (Male respondent 5, July 8, 2013)

"The city is known for the greens and if the natural woods are reduced to create place for development then new greens are also being added…. The best thing about living in Islamabad is the nature whether natural or developed. View of the Margallah is what people want to have wherever they live…"." (Male Respondent 2, July 9, 2013)

Quality of relationship of man and society

Social integration and the sense of well-being:

The social networks in the G-6 sector vary with the sub sector and neighborhood. But one thing common in all subsectors is the social interaction parameters defined for women of the area.

The value of social networks in providing a sense of security and support has been reflected in what makes people stay connected with the neighborhoods physically and psychologically.

"The friendships we developed in the neighbourhood have been like family..... This is one reason why we wouldn't think of moving to any other neighbourhood as the social relationships have developed over years here. Social ties are great support anywhere one lives. We cannot live in isolation. It is not the culture we are used to." (Male Respondent 2, G-6, July 9, 2013)

The strong sense of association is reflected through people's statements like,

"We didn't have relatives living here when my father came but the people made a unique relationship that is far stronger than usually one can think. They say blood is thicker than water but I would say here water is purer. We have never felt our biradari is not here although we do would be happier if they were here too." (Male Respondent 1, G-6, July 1, 2013)

The frequency of social interactions:

"Women mostly meet women at home. We in our culture have not seen our mothers socializing outdoors. Men have all the liberty to go out whenever and where ever they like so they socialize more. While elderly either do not socialize much or if they have their age fellows in the locality they also sometimes sit together. (Male Respondent 5, G-6, July 8, 2013)

We have friends we made over here during our childhood in this neighbourhood. Those are real friendships. They are still living in the settlement though some moved away. We do not have family here." (Male Respondent 1, G-6, July 1, 2013)

Use of social networks:

The residents use social networks in the G-6 as support systems for collective action for the protection and well-being.

Awareness of social issues, norms and social responsibility:

"There are no social issues. It is a mohalla[13] and people in mohallas are like one entity. Their sorrows are mutual and their happiness is also mutual." (Female Respondent 4, G-6, July, 2013)

One indication of people's sense of belonging and living as a part of the neighborhood is the social responsibility they take to maintain regard of the norms of the society.

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[13] Mohalla is Arabic and Urdu word for neighbourhood

"Since I'm living in the mohalla I have to take care of the girls so there are no complaints from the residents." (Female Respondent 4, G-6, July, 2013)

People's awareness of their neighbourhood social issues and peoples problems is part of the social responsibility they share. One problem identified was the adjustment with the new settlers in the area. The culture that has developed over a period of years according to the residents has very little space for adjustments. The trust is higher with the older residents of the area.

"They all face similar problems like adjusting with the strangers who have moved in the area…." (Female Respondent 3, G-6, July 3, 2013)

Another respondent quoted,

"I am as much part of the community as any other and as much responsible as anyone else…..We are all one. It is not possible for the neighbourhood not to know if someone is in problem. They all come together. If there is a funeral we all will be there similarly on happy occasions we all participate. People are support for each other." (Male Respondent 1, G-6, July 1, 2013)

Quality of relationship (of man with) built environment

The physical connectivity

The residents have a consensus on being ideally located and well connected to the surroundings by a well-planned and laid out network of roads. The satisfaction is also unanimous on the public facilities and pedestrian and vehicular hierarchical streets system within the settlement according to community classes. The connection of each sector number series is provided by main avenues like Seventh Avenue (between 6 and 7) and Ataturk Avenue (between 5 and 6).

"Our sector is very well connected through vehicular and pedestrian networks to the neighbouring areas. Recently Seventh Avenue was built between the 6 and 7 series with pedestrian overhead bridge for pedestrians and the underpass built to connect the G-6 to F-6 is another facility."(Male Respondent 2, G-6, July 9, 2013)

"The roads and streets are all marked well and if one knows the basic rule of orientation of sectors in Islamabad he can never get lost." (Male Respondent 2, G-6, July 9, 2013)

Central location is one feature that people feel is a plus point and the new infrastructure built around 2007 like the Seventh Avenue, the pedestrian bridge over Seventh Avenue, the underpass at China Chowk and the Kashmir highway all have a positive impact and appreciation by the residents. Other than this the availability of public transport and points of public transport within easy reach have aided the connectivity. The signage is another feature highlighted by the users that makes navigation easier.

"There are many van stops everywhere and taxi stands also. One can go anywhere they want to. The streets are marked so there is no problem locating a house." (Female Respondent 4, G-6, July 10, 2013)

"It is very simple and clear. The main roads on all sides have street boards marked and one can reach straight without difficulty…You can walk whether from the main roads or in between the small streets to reach anywhere. It is very simple and very close too. Even the farther ones are easy to locate." (Female Respondent 3, G-6, July 3, 2013)

The Influences on relationship of built environment and people: (Organization, The physical quality of urban spaces, street systems, built fabric etc.) Satisfaction

Social responsibility

Psychological connectivity- User perception of them and the place- sense of association, ownership, and belongingness

It was interesting to observe and note the linguistic clues combined with the expressions and tone during the interviews to find psychological connectivity of the residents in the area.

Most people used "*our area*", "*our sector*", and "*hamara mohalla*" (our neighborhood) when narrating information and views on the settlement. The people carried pride, ownership and sense of belongingness while talking about "their" area.

Respondents even mentioned not going back to the place of origin and considered the settlement as "home".

"We have become so used to here that this is our home now. We go to visit our relatives on occasions but we would rather stay here. My children are also living under the same roof with their families. The culture of extended family in my case has not changed by living in the city." (Male Respondent 2, G-6, July 9, 2013)

"We belong to Sargodha but this is where I was born and have studied and lived. This is my home. I do not associate myself with Sargodha." (Female Respondent 3, G-6, July 3, 2013)

The psychological connectivity is also seen to have been shaped by the comfort level provided by the similarity to social culture in the neighbourhood.

"I come from a village. When I moved to this place I got comfortable soon as I liked the village like compact neighbourhood system here. It is same life for me." (Female Respondent 4, G-6, July10, 2013)

Awareness of built environment

The people's familiarity and awareness with the built environment in the sector G-6 is found to be 100 % from the interviews and the questionnaires. Regardless of years of living in the area the residents are well versed with the built environment and the issues of built environment. The people have appreciated the improvement of networks and their benefits. The people are comfortable with navigation in the area.

Bhara Kahu

Quality of relationship of Man and nature

The connectivity between elements of nature and man:

The connectivity is of two natures physical and psychological. The physical connectivity is also revealed to be a source of psychological connectivity and sometimes vice versa. Certain

cases have reported a psychological connectivity with the elements of nature which have had positive influences on the people and their adjustment in the locality.

"Our area is very nice, very beautiful…. All views are nice. Our eyes are used to these views...It (nature surrounding the area) is the best. We work with nature we grow on our land and eat pure food. That is life…." (Male respondent 1, BK, July 8, 2013)

Influences on (quality of) nature:

The nature in the area has been gradually deteriorated due to population growth and increase in the construction activity with no regard for nature and no checks from the authorities' in charge. The old settlers of the area have recorded this as an observation of changes in the natural environment.

"I see the new developments without any concern for nature………..The area would be an ideal place to live if the sanctity of the place is preserved and maintained. This area is blessed with a natural environment that is unique and needs to be preserved…This is one thing I admire the most here and wish it would be preserved and people realize the blessing."(Female respondent 3, BK, July 5, 2013)

Use of green spaces and water bodies

The green belts are seen only on main Murree road and not in the settlement of Bhara Kahu. However some houses in the Bhara Kahu which have the luxury of RoW outside are maintained by the owner. This is a feature visible in houses in the PTV colony and bigger house in the Shahpur.

The Korang River that flows through the settlement is used extensively for recreation, washing and drinking water for the animals.

Awareness of surrounding natural areas/ nature

Awareness of nature reserves in the surroundings was higher even in new settlers whose tenure of living was less than five years.

Amongst the top attractions for the area in general, the nature reserves ranked highest with the Shadra, Korang and Simly besides the overall greenery of the area mentioned by the respondents. A respondent to the question of greatest attraction in the area responded

"I think it is Shadra, Korang, and Simly besides the views with green mountains". (Female respondent-3, BK, July 5, 2013)

Quality of relationship of Man and society

Social integration and the sense of well-being:

The social integration and sense of well-being is greatly due to the biradari system. The people who have a biradari in the locality have as many as 100- 300 houses under one biradari.

"Living with biradari is our way of life and it solves a lot of our issues. We do not need to depend on anyone. Unity is a big strength. We are stronger and happier because we share

our moments of joy and sorrow together. It reduces the burden too on one. It is one big family…" (Male respondent 1, BK, July 8, 2013)

Influences on relationship

People's perception of them and society was sought in the survey to find if they feel a part of society or apart from society and what were the factors influencing the relationship of man with other people, and if awareness of the system had an impact.

Although the people who are not the natives of the area are very much aware of the importance of the social network in form of biradari in the Bhara Kahu they do not associate with the local biradari. People who belong to similar feudal backgrounds have shown familiarity with the system and hence understand the system of the place.

"The local community is very strong. They stand by each other in times of need….I am not a part of this community…..the system is much similar in our culture where respectable and influential elders of the community or the biradari decide everything." (Female respondent-3, BK, July 5, 2013)

Existence of social networks

The social networks in the area are according to the ethnic and neighbourhood backgrounds. For people who do not have family in the area have made networks with the closer neighbours within the street and who have people from the same origin living in the area have formed small networks. However the dominant ones are the local biradaris. The respondents who were no the original natives of the area and did not form social network within the settlement also acknowledged the need and benefits of social networks but somehow refrained from developing networks for themselves.

"Yes may be it is better to have family or friends living around in this locality. But I'm much more independent and I do not count on any one so it doesn't really matter." (Female respondent 3, BK, July 5, 2013)

Another female respondent who felt comfortable in the area said she was living there for the past nineteen years and called Bhara Kahu as her "gaon" (village) instead of her original village.

"We have made our own small social network. (Female respondent 4, BK, July 8, 2013)

The frequency of social interactions:

The biradari system of the Bhara Kahu aids in the frequency of social interactions.

"We never leave any occasion and are supportive of our people in hard and good times. It can happen to anyone. Today I don't go at a funeral no one will attend mine. We sit sometimes at my place or my brother's place and other relatives place to have a chit chat, and stay in touch so we know everyone's problems and help each other…People gather on all occasions whether happy or sad."(Male respondent 1, BK, July 8, 2013)

Use of social networks:

The social networks (*biradari*) are a strong tool for social support and changing the condition of the area by use of a large vote bank. People have reported to have resolved problems by asking their leaders/ wadera who mostly have political affiliations for improving the conditions.

"We all live together. Whoever can help would help….Our sorrows and happiness are saanjhi (shared). We help each other in times of need. Sometimes we turn to the leaders of the area too. We have a lot of votes coming from one family and they cannot afford to lose them…" (Male respondent 1, BK, July 8, 2013)

Awareness of social issues:

Strong social networks exist in the Bhara Kahu settlement of Islamabad. These networks are the product of the cultural background. The biradari system (feudal system) prevailing in the Bhara Kahu like most of the other settlements of zone III and IV and is strength of the area that also keeps the people strongly bonded to the settlement.

Quality of (man's) relationship (with) built environment

The physical connectivity

The area is connected with the main Murree road by link roads from the settlement while the main link remains the Simly dam road. Other smaller roads and trails called *"pagdandian"* are a common feature linking the area physically to the different towns and settlements. However the missing element of the visible order has been reported to have been the major problem causing navigation and orientation problems for the visitors in the area. People's physical connectivity within the settlements and to the outside the settlements has been increased by the *pagdandian* or the trails which provide easy pedestrian access.

The Influences on relationship of built environment and people

The order and organization in Bhara Kahu is somehow clear to the natives of the area and even the non-locals whose years of living are higher and for some whose navigation skills are far more developed. Mostly the natives who owned bigger pieces of land have divided the lands by their free choice making the smaller streets and connecting to the roads. This has led to an order which is understandable by the locals mostly but deep observation reveals the underlying order within the seemingly disordered organization.

The physical quality of urban spaces, street systems and built fabric etc. does not give a first impression of Bhara Kahu as a developed urban area. Rather the impression is of a disordered and under privileged area that lacks government attention for the provision of services. The interviewees reported frequent inundation of the main connecting bridge (a continuation of Simly dam road) over the Korang River in the past. This problem has been solved with new higher bridge been built. The respondents reported of addition and improvement of facilities and architecture in the area by the new arrivals.

"A petrol pump, a new bridge over the Korang nala, most famous stores from Islamabad have come up which have added to the areas facilities. Many people have moved here over this decade and many new constructions have come up from which the locals have borrowed elements and the new constructions by the locals have a difference now…..The best thing about the area as I mentioned earlier is the views created by the winding roads on the rising

and falling topography. I do have preference (for views) but unfortunately I do not have one from my house. These constructions are done by locals who mostly take the view for granted I think and try to cover every inch of the land for construction. ."(Male respondent 2, BK, July 5, 2013)

<u>User perception of them and the place</u>

Sense of association, ownership and belongingness with the place was found greater in the locals of the area and non-local who had more years of living in the settlement. Although three out of six respondents were not part of the local biradari and did not associate with the social community, they still showed some association developed with the place over a period of time, due to individual choices and preferences of location which was credited to the uniqueness of the place. Two female respondents who did not belong to the area originally but belonged to a similar culture reported to have adjusted well with the area.

"...Well I would still like to live in some place like this. I belong to Khanewal and like the village type life. I have lived in the States for five years and crave for our very own culture and want to be closer to nature...." (Female respondent 3, BK, July 5, 2013)

The other female respondent justifying her association with the place and the reason of the choice of living in the Bhara Kahu used a saying in her native language which she then translated for me;

"There is a famous saying "Shehr howay paanway qeher howay" (it should be a city whether it is hell). Means we should be living in a city whether we have to live miserably and whether its hell. So living in cities is like a charm only. Shopping areas are a problem here. But living is a lot easy. I only want to go to Islamabad as I have a job there otherwise I would not..... We have become used to the area and feel this kind of village life is better than the city for a lot of reasons. . We have bigger land here and open environment. We breathe fresh air here away from the city traffic. People are very happy over here..." (Female respondent 4, BK, July 8, 2013)

<u>Awareness of built environment</u>

People who are the locals know the area really well and the children too are aware of the routes and short cuts within the Bhara Kahu. However it was found that even the non-locals and the new settlers were aware of the surroundings whether they frequently had contact with those places or not.

4.2.3 Summary of findings of G-6 and Bhara Kahu related to Ekistics principles:

Table 11: Summary of findings of G-6 and Bhara Kahu related to principles of Ekistics

Ekistics Principle 1:	Maximization of man's potential contacts with the elements of nature (such as water and trees), with other people, and with the works of man (such as buildings and roads).		
	Indicators	**G-6**	**Bhara Kahu**
Contact with nature	**Contact with nature** <u>Existence</u> of nature (parks, lakes, forest, or open natural areas); <u>Frequency</u> of contact with nature.	Existence of contacts with fair distribution of planned parks, open natural areas in form of storm water streams, natural vegetation in all four subsectors (community class III and IV). Rawal lake rose and jasmine	Planned parks were non-existent in the area but Rawal lake /lake view park available within 3 km range are considered as available parks in the area. Nature reserves are dominant with Shadra, Korang river,

		gardens and wooded area across the Khayaban-e-Suharwardi within 2-3 km range is considered to be within the area for half sector G-6. Green belts along the avenues comprise the largest green areas in the sector. Availability of an exclusive ladies park	Simly and open green fields used for agro farming and grazing land (People consider these fields as parks)
Contact with other people	**Contact with other people** <u>Existence</u> of public space for social interaction; <u>Frequency</u> of contact with such places of encounter;	Planned public spaces for social interaction called gossip squares after every 10-12 houses Fair distribution of facilities according to community classes Bazaars have courts that are functional places of social interaction (for males only) apart from green belts in the area. An exclusive ladies park is available for females.	Public places provide places for social interaction. *Dhabay* are favourite cultural places of social interaction for male members of the community. The agro farming land is also identified by the locals as places of social interaction. Social interaction of females within houses and by sharing activities.
Contact with the work of man.	**Contact with the work of man.** <u>Existence</u> of markets, schools, places of worship etc. <u>Frequency</u> of contact with these places	Sector has planned public facilities distribution according to community classes with mosques and Janazagah, markets and bazaars, primary and secondary schools, *chai khana, khokay,* public open spaces, healthcare, drinking water filtration plants etc. Higher order public facilities (banks, cinema, community centre, restaurants, GPO, GTS, police station, petrol pump etc.) are located along major corridors of connectivity in the markaz and Aabpara for wider public use.	Distribution of major facilities (petrol pumps, banks, market and commercial area, public health care, public schools, weekly bazaar, police station etc.) is along the Murree road and the Simly dam road which form the major corridors of connectivity for wider public use. The neighbourhoods have smaller commercial areas after half to one kilometre with smaller market and offices. Mosques are distributed generously in the area with one to two in street and some places after every street. Private academies and schools are located within 5-10 minutes walking distance and are found in most streets in the area.
Ekistics Principle 2:	**Minimization of the effort required for the achievement of man's actual and potential contacts. He always gives his structures the shape, or selects the route, that requires the minimum effort.**		
Effort for Contact with nature	**Effort for Contact with nature:** <u>Distance/ ease of access</u> to nature (parks, lakes, forest, or natural areas); <u>Modes and time</u> to access these places (walking, public transport, car), etc.	Parks and natural areas are within easy access of half to two kilometre range and can be accessed by walk. The Rawal lake rose and jasmine gardens and wooded area across the Khayaban-e-Suharwardi is within 2-3 km and within ten to twenty minutes walking distance but mostly accessed by public and private transport which takes around ten minutes.	Nature surrounds the areas and the Korang river and green fields are within easy access by walking. However the Shadra and the Rawal lake are accessible by public and private transport which is within five to ten minutes' drive.

Effort for Contact with other people	**Effort for Contact with other people:** <u>Distance/ ease of access</u> to such places of encounter; <u>Modes and time</u> to access these places of encounter;	Gossip squares are located after every 10-12 houses are found in every street within 1-2 minutes walking distance. Bazaars with courts, parks and mosques are also within 2-5 minutes walkable distance in community class II and IV. Kiosks are located in every subsector at 2-5 minutes walkable distances and are the easiest and most convenient locations for social interaction after the gossip squares. The green belts in the area and along periphery of the sector are located within the 2km boundary of the sector and walkable. Ladies park is within ten minutes walking distance from the farthest dwelling in the sector w.r.t. the park.	The area has *biradari* system which comprises as many as 300 houses in the locality. Easy access by walking to the places of social interaction (mostly the land and houses owned by people of the biradari and also the *dhabay* located along the main roads).
Effort for Contact with the work of man.	**Effort for Contact with the work of man.** <u>The distances/ ease of access</u> to the other houses, commercial areas, schools, offices, places of worship etc. <u>Modes and time to access</u> these places	Mosques, Janazagah, markets, bazaars, weekly bazaar, primary and secondary schools, *chai khana, khokay*, public open spaces, healthcare, drinking water filtration plants etc. are all within maximum ten minutes walking distance. These are accessed by walking by the majority.	Mosques are most conveniently located in the main areas and in the streets within 2-5 minutes walking distance. Health care in form private clinics is located within 10 minutes walking distance but the public health care services are along the Simly dam road at five minutes distance by public transport. Markets are within 5 minutes walking distance within neighbourhood and at the most 10 minutes on the Simly dam road. Major commercial area along the Murree road is accessible by transport which takes around ten minutes. Schools are also located within walking distance and are accessed by walk. Ease of access is provided by *pagdandian* or trails in the locality.
Ekistics Principle 3:	**Optimization of man's protective space, which means the selection of such a distance from other persons, animals, or objects that he can keep his contacts with them (first principle) without any kind of sensory or psychological discomfort.**		
Protective Space	<u>Awareness</u> of the environment The <u>perception</u> of safe distance The <u>distribution</u> of the personal, private, and public space	High level of awareness of the physical and social environment existed amongst the residents. The perception of safety within the sector for self and other members of the family was higher (reported 100%) till a decade ago but has reduced (to	Locals had high level of awareness of the physical and social environment and issues but were resistant to providing information regarding the safety issues and experiences relating to use of drugs or arms in the area. Non-locals were also

		91%) for children with the growing and changing community in the area. Children were reported to walk to their schools and move in the sector without being accompanied by parents earlier from all subsectors. Females and children are the protected members of the society by the males and safe boundaries for women remain the private dwelling if not in groups or accompanied by the male members of the family, while for children safety is perceived to be within the street. Hierarchical network of roads provide less traffic and allow safe pedestrian movement within the subsectors. Absence of formal system of surveillance was reported and existence and dependence on private chowkidaar by a few residents but was considered not required.	aware of the physical environment, norms and culture of the society. Non-locals reported use of naswaar and arms was common in the area and a part of the local culture. The perception of safety was found to be 100% amongst the locals of the area for self and members of the family. Comfort level extended up to limits of the biradari areas which extend from 100-300 dwellings. Children go to schools unaccompanied by family. Females of the biradari had boundaries for movement in public areas not because of safety but because of the norms of the society. Perception of safety within the non-locals was lower and reported very low levels of safety perception in their visitors too. The major concentration of the activity zone limited to the main corridors (Murree and Simly dam roads) allows safe pedestrian movement within the neighbourhoods. Locals considered no need of surveillance while non-locals considered it important.
Ekistics Principle 4:	**Optimization of the quality of man's relationship with his environment, which consists of nature, society, shells, and networks.**		
Quality of Relationship of man and nature	**Quality of Relationship of man and nature:** The <u>connectivity</u> between elements of nature and man. <u>Influences</u> on (quality) of nature. <u>Use</u> of green spaces/ water bodies etc. as bifurcations or transitional spaces. <u>Awareness</u> of surrounding natural areas/ nature reserves etc.	The distribution of the green spaces (developed and natural) in the subsectors of G-6 provides physical connectivity with the elements of nature for all residents. The green belts(as wide as 300-400 feet) and parks are used as an extension of the greens available within dwellings and different levels of community classes while acting as transitional spaces with different community classes and functions. Greens are also used for privacy in form of hedges and screens in houses without a boundary wall. The environment is protected with strict laws also applicable for the RoW in the area which do not permit cutting of trees. The storm water streams in their natural form have been	The Korang river flowing throughout the area and open green fields and the mountains are features people connect with physically, visually and psychologically. People have reported to have a strong relation to the nature and admire the natural landscapes compared to the planned ones. Smaller houses do not have gardens and RoW is only in certain pockets with higher income groups. Non-locals have reported nature as being an important element of choice to living in the area which aids in the adjustment in the area and a source of pleasure. Awareness of the surrounding natural areas was higher in new settlers also.

		extensively used by children for playing and fishing in the past but has deteriorated in the recent years with sewerage and trash. People are aware of nature within and outside the sector and use the places for recreation and relaxation. High appreciation of the greens is found in residents and beautiful privately maintained RoW can be seen in the locality.	
Quality of Relationship of man and society	**Quality of Relationship of man and society:** The social integration and Sense of well-being. Influences on relationship. People's perception of them and society (a part of society or apart from society) Existence of social networks The frequency of social interactions Use of social networks Awareness of social issues	Social integration has been a key feature in the G-6 which is considered to be unique but varies with the sub sector and neighborhood. The networks provide with a sense of security and well-being. This is one identifying feature important to the residents who associate with the social network which they call a biradari, and do not want to move out of the area for this positive point in the settlement. People have explained the relationships developed in the heterogeneous community in settlement to be stronger like in a homogeneous community. People who associate with the society have a sense of social responsibility to maintain regard of the norms of the society	Social integration and sense of wellbeing is high in the locals due to biradari system. However the non-locals who have lived in the settlement for more than 15 years and have developed social networks also have shown association with the area calling it their village. The locals are however considered to be the most privileged people in terms of having much stronger social support system. The frequency of social interaction in the biradari is much higher and people have reported not to miss any happy or sad occasion. People have also reported to have used the social networks for the betterment of the area and peoples conditions by the use of large vote bank. Awareness of social issues is high due to the interaction.
Quality of Relationship with built environment	**Quality of Relationship of man with built environment:** The physical connectivity The Influences on relationship of built environment and people. (Organization, The physical quality of urban spaces, street systems, built fabric etc.) User perception of them and the place- sense of association, ownership, belongingness Awareness of built environment.	The physical connectivity is also a strong positive point identified by all interviewees and respondents of questionnaires. The inter sector and intra sector connectivity and ideal location of the sector are highly appreciated and become one reason for not wanting to move out of the sector. Options for connectivity in form of infrastructure and easy public transport availability in the area are added points. The people's awareness has improved of a kind of planning which they say is a unique feature of the city and admires the benefits of the same. Strong sense of association and pride in residents is evident form the surveys who have always used the term "hamara	The physical connectivity is provided by the main Murree road and Simly dam road with link roads from the settlements to the main roads. The pagdandian or trails are a feature in local culture which provides ease of inter-settlement and intra-settlement access. However while the locals are very comfortable using these pagdandian, the outsider is not very comfortable navigating through the routes. The non-local respondents also reported to have navigation problems experienced by their visitors while to the locals it is very easy. Although the problems were reported by the locals and non-locals but a special sense of place has developed with the nature being dominant feature.

| | | mohalla" (our neighbourhood) which shows a collective sense of association | Non-locals however who adjusted well associated them with the place but the one's not comfortable because of the missing link with society also commented on the place being otherwise desirable to live. |

Source: Developed by author

4.3 Analysis of findings

4.3.1 Analysis of findings related to the principles of Ekistics in G-6 and Bhara Kahu:

This section analyses the findings in both settlements related to the principles of ekistics to see if the same principles given by Doxiadis Ekistics theory also form the basis of these settlements and what is the meaning of needs and their importance to the people of this area. It also analyses how the people of each settlement assess the success of the settlement.

Principle 1: Maximization of man's potential contacts

Existence of contacts (primary, secondary and tertiary)

The facilities distribution in the G-6 is based on both the principle of externalization and centrality while in the Bhara Kahu it is based on the principle of externalization and concentration of major facilities along continuous routes to guarantee maximum amount of sharing and points of maximum accessibility. Both the settlements have existence of contacts offering choices and opportunities for personal welfare and fulfilling needs. People in Bhara Kahu have different meanings for different places (e.g. open green fields are considered to be parks) and hence their needs are fulfilled by substituting places with meanings they give to them.

Frequency of contact (primary, secondary and tertiary)

Frequency of contact is found to be affected by the availability, convenience, ease of access, personal preferences and choices, comfort level and inclusiveness or exclusiveness defined by protective space and norms of the culture and society. Social structure is culturally setup such that men in both settlements tend to have more contact with nature, people and places as they are engaged in outdoor activities. As for women (housewives) in both the settlements their contact is generally limited due to the perceived gender roles which restricts them to their homes and also due to lack of desire for outdoor activities on their part by an unsaid accepted norm of the social culture conditioning them. In contrast to this, the working women in both settlements tend to have more contact with nature, people and places.

Principle 2: Minimization of effort in achieving man's potential contacts

The convenience was seen in terms of **pedestrian movement** which is the most common movement mode and pattern and the **vehicular movement** in form of public and private transport since the increase in vehicle ownership and dependence, to perform daily activities.

Ease of access within the settlement has a profound effect on people's mobility and independence as reported by the residents of sector G-6. The planning in G-6 has aided the minimization of effort in achieving the contacts and people have appreciated this aspect of provision of facilities at accessible distances and have used it intensively. People without private transport and women have benefitted the most by being able to perform daily chores without dependence on public transport and upon other members of the family. The easy access to all major and minor needs and in the area has also reduced people's dependence on facilities outside the sector.

The location of the contacts in Bhara Kahu is in accordance with the structural principle of externalization (CSIR, 2000) and supports the higher-order urban activities to be located along continuous movement routes for availability to a wider array of public and strengthening the private quality of the residential area. Here the local system of trails (*pagdandian*) in region not limited to has provided people with ease of access to contacts thus minimizing the distances and effort for maintaining contacts.

Principle 3: Optimization of man's protective space while maintaining his potential contacts

The perception of safety in general is seen to have a direct relation with the presence of social networks and the physical planning in the area, which provides visibility due to straight streets, and open public areas, while also providing psychological sense of security.

Awareness of the environment

The awareness and familiarity of the environment is a fundamental indicator that is seen to have shaped the comfort level in the neighborhood and broader scale of area, perception of the place and safety in the area.

The perception of safe distance

The perception of safe distance is shaped by the comfort level in the neighbourhood. The perception of safety in general is seen to have a direct relation with the presence of social networks and the physical planning in the area. The findings revealed that the perception of safe distance was highly dependent on the awareness of the environment and people in the neighbourhood, tenure in years of living in the neighbourhood, the social networks and the sustenance of the norms of culture for social interaction and gender needs for protection. The male members as the heads of the family (patriarchal system) of the society mostly defined the protective space for the members of the family like the females and the children.

Awareness of a culture where harassment of women is feared, men generally tend to be more protective towards their own women and set boundaries for movement, contact and interaction within the settlement. Hence there are public places from which women are generally barred and this has become an understood and unsaid norm for the society, which is related to the comfort level for the gender.

The distribution of the personal, private, and public space

Another feature (highlighted by the respondents) that is important in space distribution is the social and cultural system within the area. In the biradari system the space distribution is

related to the mindset of the vast biradari being one family hence the comfort level in the private and semi-private jurisdiction extends to the areas till the biradari land.

The reported negligible crime in the area is mainly credited to the grid-iron plan by the residents which aid visibility due to straight streets, and open public areas, providing psychological sense of security as compared to the organic settlements. Crime prevention is one of the issues identified by the CSIR framework for settlement making that appropriate design can cater to.

Principle 4- Optimization of the quality of man's relationship with his environment, which consists of nature, society, shells (buildings and houses of all sorts), and networks (ranging from roads to telecommunications).

This principle has been found to be of utmost importance as the cognitive patterns of people are shaped by the quality of relationship they have with their environment which in turn determines the success or failure in both human settlements under consideration for the residents. The quality of relationship is enhanced and improved by the connectivity, whether physical, social or psychological and even visual. Influences are seen to be directly proportional to the connectivity. For example they are positive with the high connectivity. The connectivity is seen to be enhanced by the number of years of living in the settlement and the presence of social networks and places of social interaction whether planned or emerging out of the local culture.

The physical, social and psychological connectivity are also affected by the awareness, individual or collective attitudes, beliefs and preferences. In this particular case, culture and norms in both settlements show great similarity which can be attributed to the regional influence. The awareness of the non-locals in the settlements is related to the human survival instincts which comes from requirement of the fulfilment of needs like maximization of contacts in a the new environment they have become a part of (principle 1), looking for the nearest contacts of interest whether nature, people or other works of man and means to minimize the effort for maintenance of contacts (principle 2), determination of the boundaries for protective space (principle 3) ultimately to be able to relate to their choice of human settlement.

4.3.2 Outcomes of planned and unplanned settlements

This section relates to the third sub question:

Which are the outcomes that are identifiable in the human settlements under consideration and what is their relation?

In order to provide an answer to the sub question the fifth principle of Ekistics was assessed against both settlements to determine their outcome.

Principle 5- Man organizes his settlements in an attempt to achieve an optimum synthesis of the other four principles, and this optimization is dependent on time and space, on actual conditions, and on man's ability to create a synthesis.

Since the other four principles are related to the physical, social and psychological aspects of the settlement making we look at these aspects to understand the synthesis of the first four principles in the planned (G-6) and unplanned (Bhara Kahu) settlements of the Dynapolis.

Table 12: The outcomes in the broader context of the Dynapolis- City of the future Islamabad

PATTERNS	SECTOR G-6	BHARA KAHU	OUTCOMES
Physical	The area is characterised by visible physical order, hierarchy of connectivity networks, housing and facilities. The location is ideal and central in the city maximizing the points of contacts (principle 1) and providing ease of access and movement (principle 2) to the physical points of contacts allows people to perform activities without or with minimum reliance on transport or other members of the family	The area is characterised by a varied topography, physical and natural quality of space which is organic and has an invisible rational order and organization that fits into the local culture for the people. The characteristic is unique and typical of the region and it was purposefully included in the Dynapolis by Doxiadis. .	Uniqueness of order in both situations is accepted by the masses and provides them with a sense of place as well as protection and comfort in their own physical and social setting.
Social	Social integration of heterogeneous community is a unique outcome of the intentionally planned places of social interaction located within easy reach which has been found to guarantee support for the people	Strong social system of biradari is a characteristic of the area with homogeneous communities dominant. The place been shaped and used widely by the dominant local culture. Hence the social interaction in traditional settings has enriched the social cohesion while preserving traditions and culture.	Social system of network in the G-6 which has evolved into a biradari over time and the prevailing biradari system in the Bhara Kahu have cultural and regional roots and hence similarity in both settlements is found. The biradari system has provided the residents of both settlements with increased the social resilience and shock absorbing capacity in the people of both the settlements which keeps them tied to their locality.
Psychological	Protective space (principle 3) and quality of relationship in the settlement (principle 4) is related to number of years of living in the settlement and the existence of social networks. The people have developed a psychological connectivity with their environment which keeps them in the locality.	Protective space and quality of relationship in the area is related to biradari and years of living in the settlement. It is also defined by the norms of social behaviour prevalent in a rather conservative culture.	Protective space and quality of relationship is enhanced by awareness and familiarity of physical space and presence of social networks. Personal preferences, beliefs, attitudes and understanding, adjustment and adaptability to norms of the social culture also influence the cognitive maps of individuals.

Source: Developed by author

From the above outcomes it can be inferred that the settlements are a product of social ordering of space with culture playing a very important role in the settlements' development over time. In the patriarchal society, men are seen in charge of defining the meanings of spaces for both genders. The gender bias that defines allowable space for users of the environment has shaped the perception of the places, hence, relationships of people and

places. Even though sector G-6 was planned considering the gender segregation in settlement as a cultural requirement and provided exclusive and enclosed spaces for women like the ladies park, impacts of male chauvinism embedded in culture has strongly affected and shaped the outcome of space use in the settlement.

4.3.3 Elements that explain the success factors for the G-6 and Bhara Kahu

This section relates to the fourth sub-question:

Which are the different elements that derive from the analysis that explain the success factors for both planned and unplanned settlements and how do they score against each other when compared?

The model of Dynapolis and Ekistics:

The research started with the exploration of why and how the model of Dynapolis has survived through fifty three years and how long can it survive, when the world is turning away from planning and consider it to be an obsolete practice in today's age. Doxiadis has given due importance to time to determine success of human settlements.

The answers to this lay in the humanistic approach to creation of human settlements. The region has a past with similar exercise in the planning (Harappa in Taxila), and the existence of a human settlement on similar design proves the test of time for the model.

The research sought to understand the construct of reality in the minds of people of how they make a sense of the world they live in and the world they see. The theory of Ekistics is taken as a model and as a tool to help understand reality and it provided a base for the defining success. According to Doxiadis success is achieved when:

1. Settlements promote happiness and safety. This is achieved when needs of the people pertaining to the settlements are satisfied; and

2. There is balance between man and machine so there is no conflict between them, by complying with the five principles of Ekistics

The success of the settlements is thus explored with Doxiadis' idea that learning about human settlements can be from the settlements themselves and to understand the human settlements one must study the spatial morphology, the primary spatial patterns related with human actions and behaviour and functional and organizational structure that connect both (Doxiadis, 1968). Hence the indicators of success picked from this definition helped evaluate the planned and unplanned settlements of the Dynapolis. A simultaneous study of positively performing settlements (CSIR, 2000) for the analysis of success is also considered to interpret and get behind the answers from the respondents. This is done because of the high similarity of concepts and common idea of human welfare.

As settlements are characterised by diversity (CSIR, 2000), and are said to grow in areas of greatest attraction and least resistance ((Doxiadis, 1968), the residents who belonged to different socio-economic groups, age groups, education level, tenure of living in the settlement and gender were asked questions regarding the settlement rating, what were the greatest attractions, what were positive points of the area and the negative points of the area

in the perception of the residents to see the relation of these differences in the society and satisfaction for a broader community. In order to see what concepts the participants used to make sense of their worlds, the meanings or significance it has for them, how the people and the inherent norms, values and rules affected the settlements and their relationships.

*"Man always choses places that have greatest **attraction** and least resistance…"*(Doxiadis, 1968, Doxiadis, 1970)

The attraction as already explained in chapter 2 is a very significant variable that corresponds to different needs of people pertaining to human settlements. People get attracted to places in a quest to satisfy their physical, social, aesthetics, economic or even unique physical or sensory experiences and other needs. However, economic attraction (economic feasibility and affordability), the sense of place, the value of owned land in kanals[14] were a few of the mentioned attractions for the Bhara Kahu area.

Economic attraction:

One attraction is the economic affordability of the area within the Islamabad capital territory. This is for the people who have migrated and are working in Islamabad. This category also comprises of people who have moved from G-6 after retirement where they had government accommodation and otherwise could not afford to own a house in the developed sectors of zone I.

Accessibility attraction:

Accessibility is an attraction for people to satisfy the physical needs and corresponds to principle 2 of the ekistics. For the people of Murree who work in Islamabad and people who have moved from Islamabad sectors Bhara Kahu is regarded as an attractive and ideal location as it is only at a distance of 39 km from Murree and within the Islamabad Capital Territory. In the case of G-6 it is the location within the developed zone and close proximity to the offices and a vibrant city life.

Physical (natural or man- made environment) attraction:

Different elements in the physical environment create a uniqueness associated to that particular place which becomes attraction for different people. For some people it is the nature, the landscapes and the country side experience in the Bhara Kahu, while in the case of G-6 it is the location within the main city and an ordered spatial plan in the developed zone.

Social environment attraction:

Many respondents identified as the social environment of the settlements under consideration to be the main attraction for them which is the reason they refuse to move from the settlement to some other place. This remained true for both the planned and the un-planned settlements.

The mix and maximum variation in the sample was picked to understand the needs, assess the perceived value of spaces and evaluate the elements that are considered important in a

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[14] Local unit of space equivalent to 500 square yards

heterogeneous community in settlements that promote safety, happiness and satisfaction and ultimately define success of the human settlements.

In answer to question about what was the most appreciated thing in the respective neighbourhood's majority of the interviewees from both the settlements replied the social networks, biradari system and the physical characteristics of their area. The planned settlement dwellers appreciated the planning, the location, accessibility and the order in the layout while the settlers of Bhara Kahu admired the vast lands they had with nearness to most nature reserves.

Satisfaction of needs

Satisfaction here is with respect to people's psychological state which they mostly associate with the physical, social and protective space. Satisfaction with respect to the settlement was also seen to be related with the contentment and conditioning of the people in the circumstances.

The physical, social and psychological spatial needs addressed in the principles of ekistics form the criteria for assessment of the two settlements. Hence the incongruity or gap between the present and the desired situation or consequences in regard to the two groups (the residents of G-6 and Bhara Kahu) is analysed with the principles.

The assessment for needs in both situations of the G-6 and Bhara Kahu was also made in order to understand the nature of contacts which makes sense or are relatively important to the inhabitants of both settlements (Table 13and Chart 4). It was found that the needs of the people from both settlements are defined differently hence priorities differ. It is seen to have a relation with the existence, non-existence, awareness and adaptability to the situation.

The research also sought the need assessment of people pertaining to the settlements. Preferences of close proximity were asked by the residents of both settlements which were in sharp contrast (Chart 5 and 6).

What would you prefer being near to when deciding on location to live?

Table 13: Need assessment- locational factors

Preference of close proximity to	Sector G-6 No. of responses	%	Bhara Kahu No. of responses	%
a) Nature	16	73	17	71
b) Relatives/ friends	16	73	19	79
c) Commercial area	18	82	21	88
d) Places of work	15	68	12	50
e) Places of worship	19	86	22	92
d) Academic institutes	12	55	14	58
f) Healthcare	15	68	18	75
g) Main road	14	64	20	83

Source: Author

Chart 4: Need Assessment- locational factors

Preference of proximity
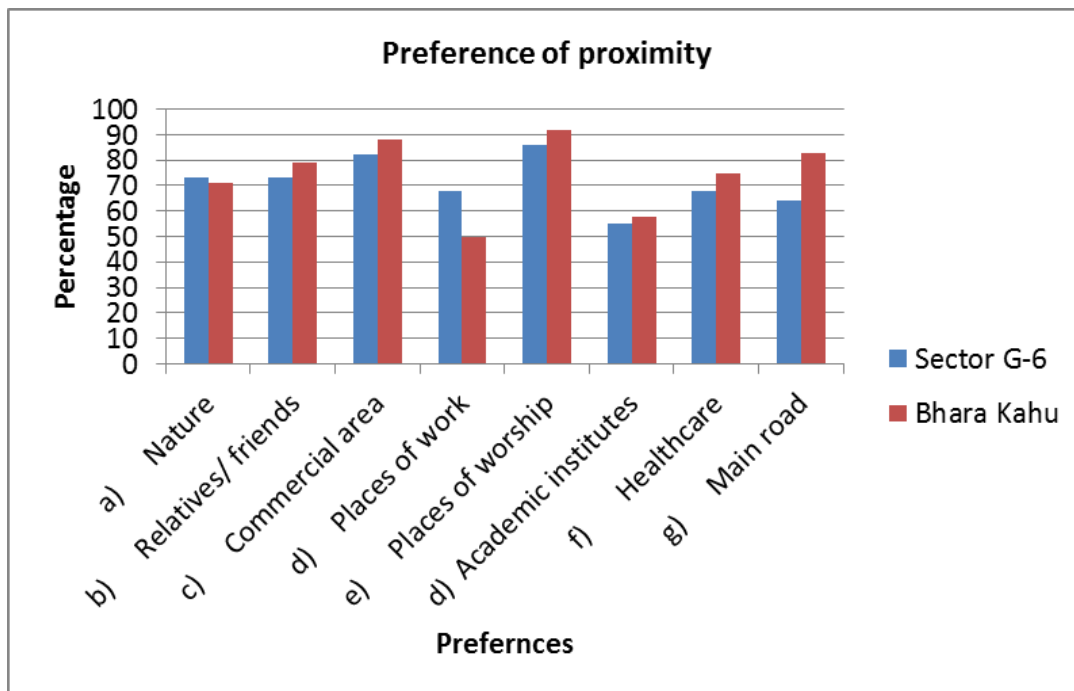
Source: Author

Chart 5: Need assessment (perceived value of contacts) - G-6

Needs of people pertaining to the settlements- G-6
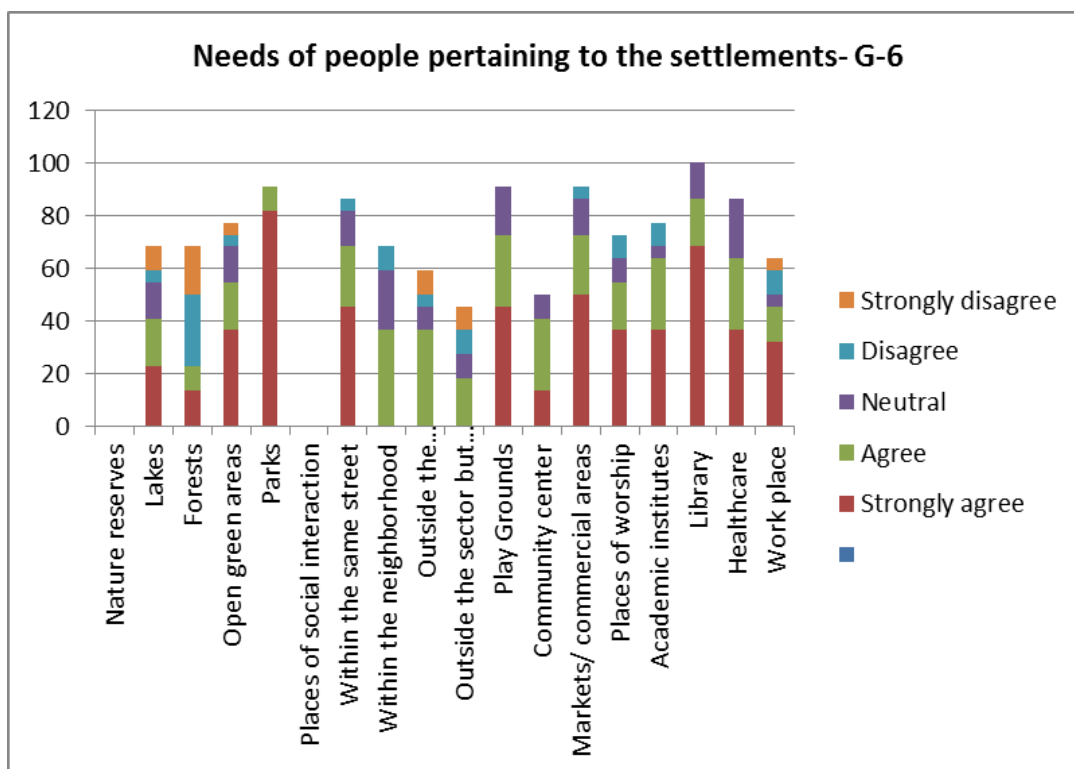
Source: Author

Chart 6: Need Assessment (perceived value of contacts) - Bhara Kahu

Needs of people pertaining to settlements- Bhara Kahu
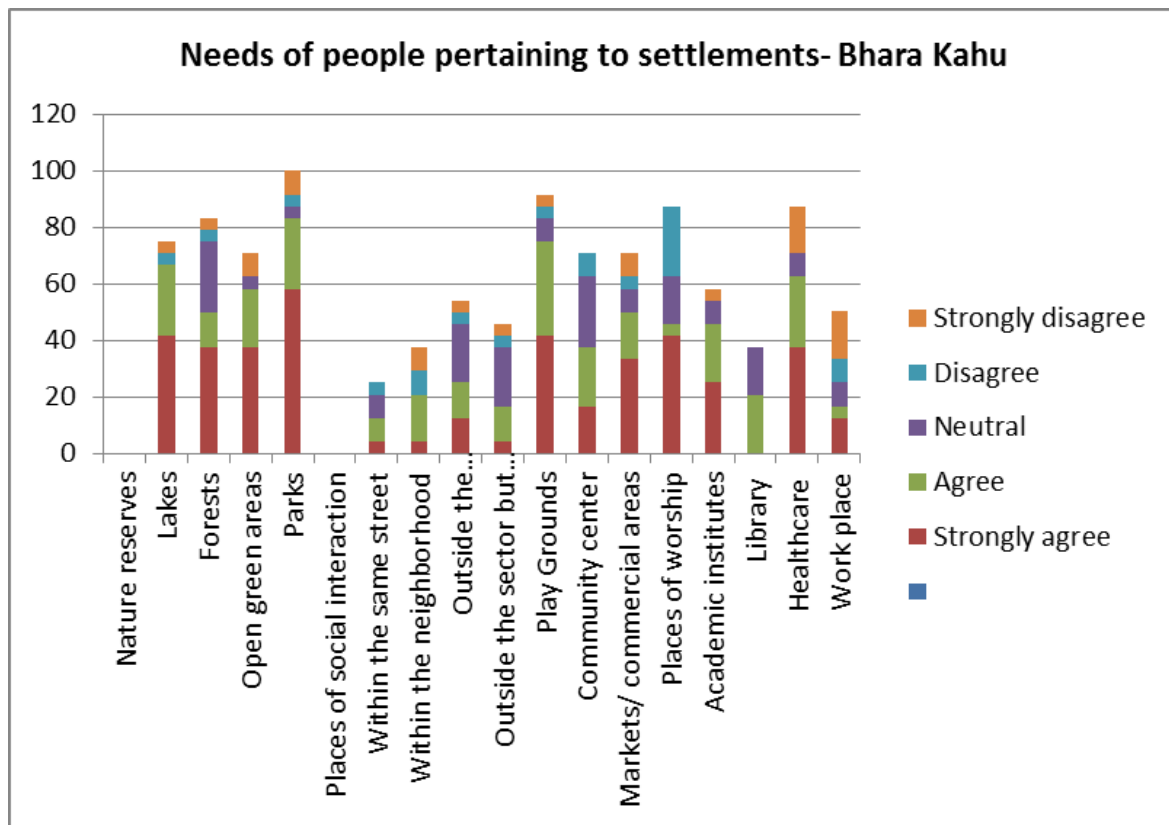
Source: Author

The analysis of findings also reveals that today's needs of people are guided mostly by the conditions created by the overall situation of security, economic crisis, energy crisis, and political instability in the country. Hence the focus of people is not only on the five principles in the same order in the human settlements. The people have also been observed to have a lot of adjustability in different situations.

Another important explanation for the needs is the survival instincts of man. For example, Maximization of contacts (principle 1) for the new settlers (whether in the case of G-6 in 1960s or in the case of Bhara Kahu at present) is survival instinct based need. Man first tries to gain awareness of the existence of contacts and then tries to see which ones are suitable for him being the nearest requiring minimum effort (principle 2). The awareness is further related to the determination of boundaries for maximization of protective space (principle 3) for self and for family according to the norms and culture finally to be able to relate (principle 4) to his choice of living (the settlement). In a question related to the satisfaction in the settlement posed to the residents of both settlements under consideration through open ended questionnaires answer was found to be almost equal in both settlements. Table 14 and chart 7 show the results.

Question: Are your needs satisfied with the facilities in your settlement?

Table 14: Results of satisfaction query in the planned and unplanned human settlements

Satisfaction with settlement	Sector G-6 No. of responses	%	Bhara Kahu No. of responses	%
Yes	18	82	20	83
Neutral	2	9	1	4
No	0	0	3	13

Source: Developed by author

Chart 7: Satisfaction with area and facilities
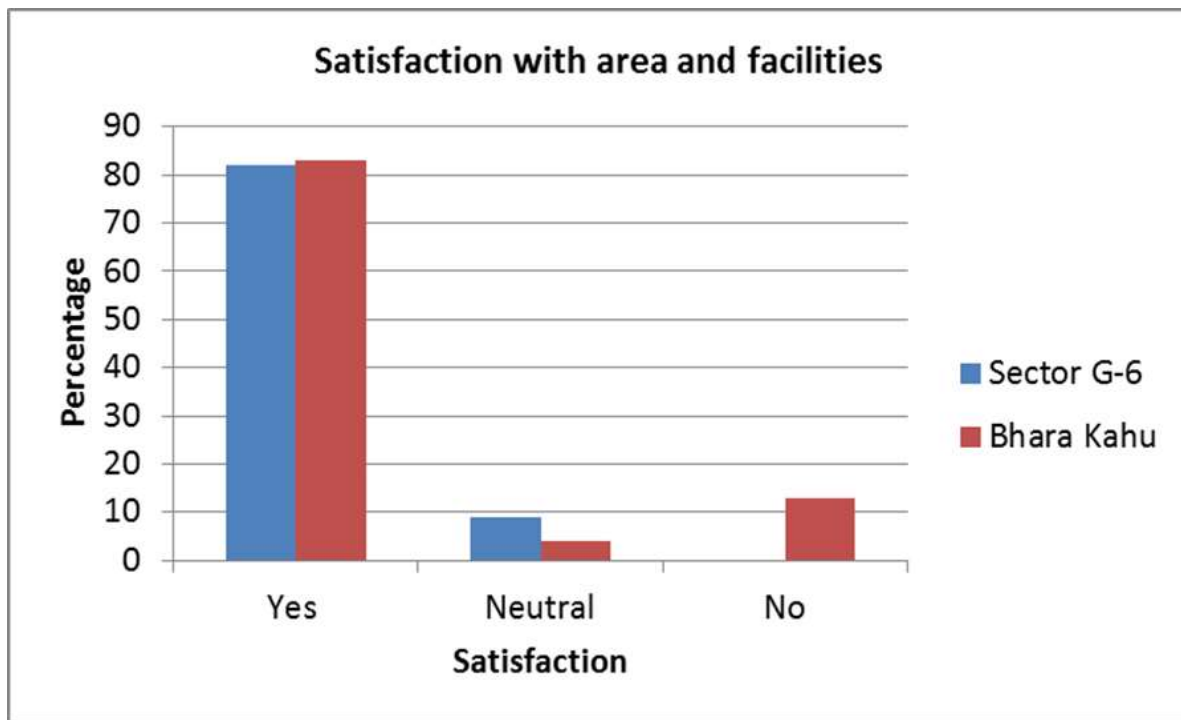
Source: Developed by author

Happiness

Although a difference in the physical aspect (availability and accessibility to contacts) in need is a concern brought out by a few respondents but happiness was largely associated with the fulfilment of social and psychological needs in both settlements. The existence of strong social ties and networks enhanced the sense of protection, security and support hence sense of well-being in the settlements which formed a reason to be grounded to the settlement. The respondents of the survey in answer to an open question regarding their choice of place if they got an opportunity to settle somewhere replied in straight *"no"* answers with additional statements like *"I don't want to go anywhere"* and *"we are very happy here"*. A few respondents who mentioned localities they would like to go to mention security as the reason. These respondents belonged to the new settlers who did not have a social network in the area.

Question: If given a choice and opportunity to settle in some other place, would you move out of the area? If yes, then where would you like to move?

Table 15: Respondents 'preference for relocation

Preference for relocation	Sector G-6 No. of responses	%	Bhara Kahu No. of responses	%
Yes	1	5	4	17
Neutral	1	5	1	4
No	18	82	19	79

Source: Developed by author

Chart 8: Respondents 'preference for relocation
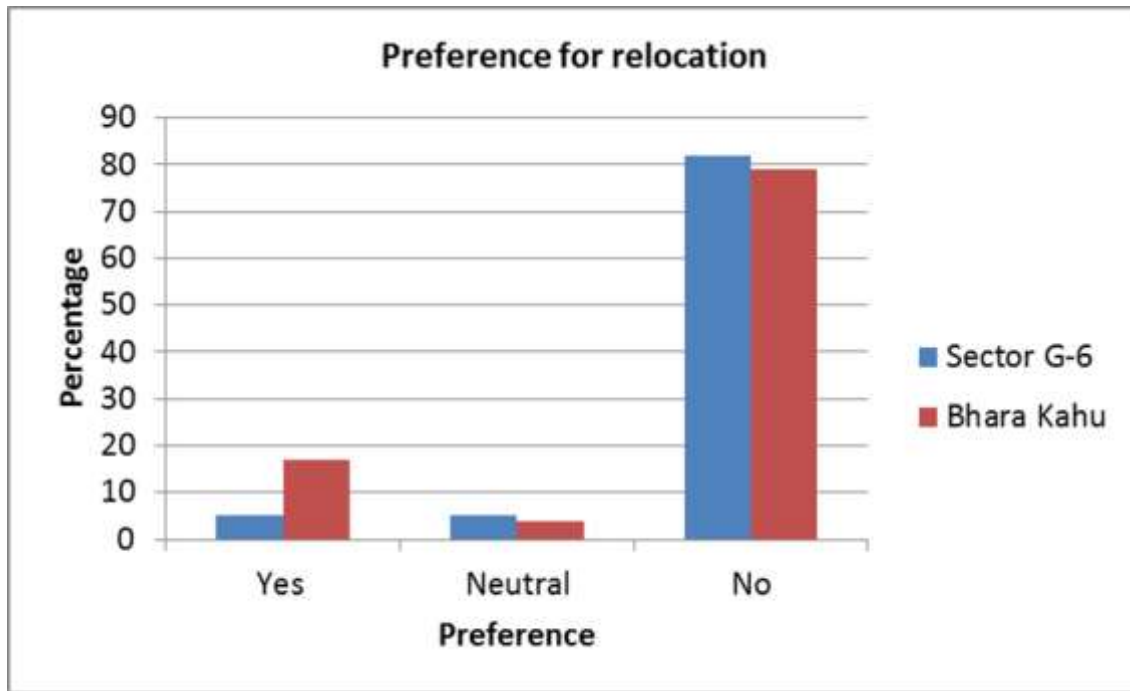
Source: Developed by author

Safety

Safety remains a major concern in both planned and unplanned settlements of the Dynapolis and is largely associated with awareness and familiarity with the area rather than surveillance and secondly with the social networks in the area. It was also revealed from the interviews that the physical organization and order had also a psychological effect on the perception of safety for the people. The years of living in the settlement combined with the adjustability is an important factor relating to the comfort level in the settlement. The interviews for this research showed the comfort to have increased with the passage of time. For example a new settler in the Bhara Kahu said;

"Yes now that I am much more familiar with the residents and the area I feel rather secure than I used to feel initially when I came. It is natural to become comfortable when one knows the surroundings and people…. There was a fear too of the place not known to us…" (Male respondent BK-2, July 5, 2013)

The same question was asked in the questionnaires and the respondents from both the settlements showed awareness with the area being the most important factor. Table 16 followed by the chart 9 below shows answers from both settlements.

What makes you feel safe and secure in your locality?

Table 16: Perception of safety within human settlements

Perception of safety and security	Sector G-6	%	Bhara Kahu	%
Presence of relatives/ friends in the locality	17	77	18	75
Surveillance/ security arrangement in the locality	6	27	6	25
Presence of police in locality	4	18	10	42
Awareness and familiarity with the area	18	82	19	79

Source: Developed by author

Chart 9: Perception of safety within human settlements
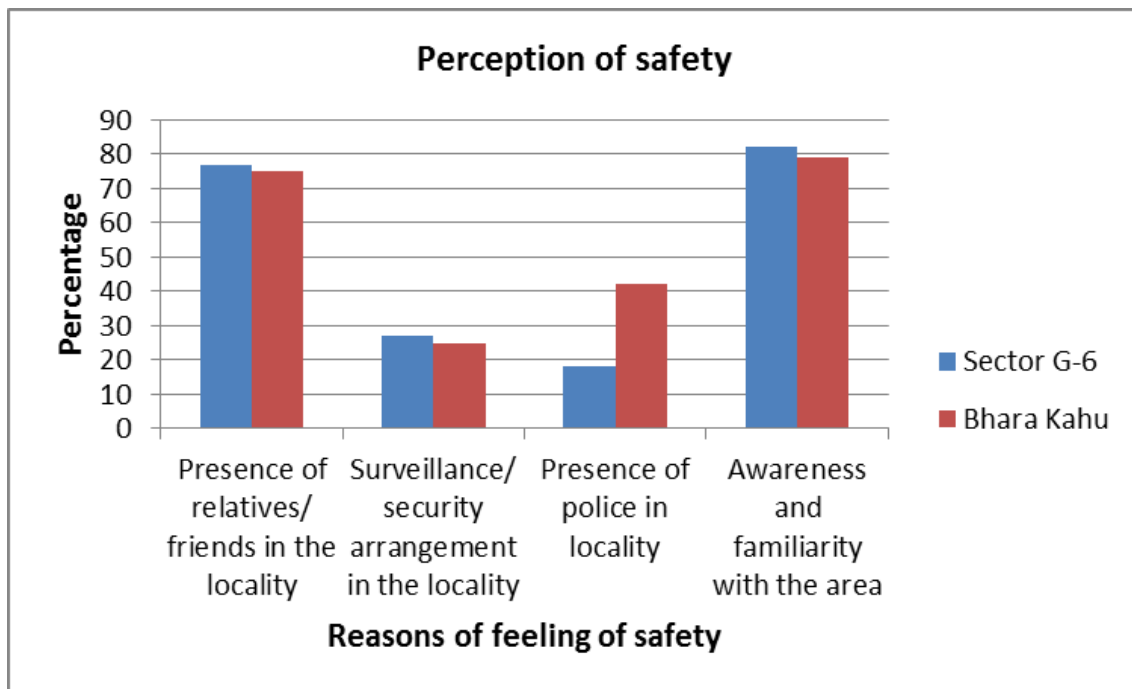
Source: Developed by author

The co-relation of the physical, social and psychological phenomenon

A strong co-relation exists between the physical, social and the psychological phenomenon of space and place in the human settlements which is difficult to describe as a cause and effect relationship. The social and psychological world with all its complexity is hence comprehended through the cognitive maps of the people which are more significant in shaping the physical world. This is in accordance with the concept given by Portugali (1997; 2011).

The spatial territories are defined according to the social strata and their needs of privacy by the physical demarcations while the mental maps of the place are usually explained through the spatial-psychological territories of comfort for the community according to the norms and

values. For example, the gender segregation in the local culture which made females uncomfortable going to public parks, felt comfortable in the enclosed and exclusive ladies park.

The human settlements theory and Doxiadis' ideas on settlement development are used below to discuss the situation in the settlements under consideration.

*"(He always gives his) **structures the form** or **optimal size…"**(Doxiadis, 1968)*

The people of Bhara Kahu using their freedom to develop living environments have practiced for many years planning and dividing their land themselves according to their needs and interests. This incremental change of patterns guided and influenced by the social and economic needs which has given the minor shells optimal manageable sizes as per capacity of the inhabitants and an organic form to the micro settlement.

*"He always selects a **route (minimum distances, ease of access)**, which requires the **minimum effort**…"*(Doxiadis, 1968, Doxiadis, 1970)

People of the Bhara Kahu in zone IV have made smaller cut through walkable routes and trails as shortcuts called *kucha rasta* or the *pagdandian* which gives them ease of access to the points of contacts like the markets, main roads and inter-connections to different neighborhoods. Surprisingly according to the locals' experience and research observation, these take almost the same amount of time by walking as they take through the use of public transport.

Balance between man and his man-made environment:

According to the theory of ekistics the settlements will promote happiness and safety hence satisfaction when a balance is achieved between man and the man-made environment by complying with the five principles of ekistics.

Since these principles are said to be an extension of biological characteristics of the humans and humans have always been obedient to these five principles in shaping his settlements, in a quest to enrich the quality of life hence these were sought and found present in the unplanned settlement of Bhara Kahu also. The question here arises how to deal with the problems and the complexities of the not formally planned Dynapolis to upgrade and bring them at par with the rest of the city (the planned settlements), and even if it should be done formally.

Chapter 5: Conclusions and recommendations

Introduction

The thesis intended to explore and understand the validity of theories and philosophies and the influencing factors in the formation and transformation of patterns in the planned and unplanned human settlements through time to understand their dynamics in the case of Islamabad. The study was carried out to look at the problems and issues arising from certain patterns of human settlements, and the successes and potentials of the same.

The broader objective of the research was to understand, evaluate and extend the scope of theory of Ekistics and the concept of the Dynapolis the city of future, which forms the basis of the city of Islamabad by understanding the urban morphology and the forces that change patterns in the city of Islamabad to subsequently **measure** and identify the elements that determine **the success of human settlements in time** and to assess **whether we are closer to the sort of knowledge integration that Doxiadis has advocated.**

The section gives brief conclusion according to the main research question:

What factors determine the success of human settlement patterns in the context of the Dynapolis- the city of future- of Islamabad?

5.1 Conclusions

Doxiadis' model has set the criteria for evaluating reality as economic, social, political, technological, and cultural and desirability and feasibility. The settlement of Bhara Kahu that falls in zone IV of Islamabad where Doxiadis deliberately left the settlements to emerge and grow realizing the importance of the cultural heritage of the area, while the planned settlements that were given a starting point for unidirectional growth (from NE to SW) , forms an interesting correlation in the development of patterns governed by the coexistence of the planned and the emergent also advocated by the CSIR guidelines for planning and design of human settlements (2000) and Nabeel Hamdi (2004).

The principles of ekistics gave the reference point for evaluating the physical, social and psychological needs of people in both the planned (Sector G-6) and unplanned (Bhara Kahu) settlements. These principles were seen through various indicators like the existence and frequency of contacts, the ease, modes and time to access, awareness and perception of the place, physical, social and psychological connectivity influences etc. These help in comparing the two settlements to measure the success that otherwise seem to be incomparable.

To say the theory of ekistics and its principles hold a validity that is timeless will not be wrong. The far sightedness of the theorist and the flexibility in the theory to accommodate the forces in time is the strongest point of the theory. The practical application in Islamabad has showed results anticipated 53 years ago. However, in order to measure success, the meanings people give to places are important consideration as they define the needs and their satisfaction related to the needs.

In the case of G-6, the settlement design (in compliance with the principles of ekistics) has shaped the behaviour of people who belonged to a heterogeneous community and the success of the settlement is declared in shaping the social and psychological pattern bringing them closer to form a biradari thus providing them with a sense of place with which they associate themselves. Social cohesion has also satisfied their sense of security to a certain extent, which in turn has resulted in independence for individuals (especially women and children) in moving around and performing activities.

For a homogenous community, that is dominant in the Bhara Kahu, the place has a meaning which is defined by the freedom of choice available and practiced by the inhabitants, thus the settlement is shaped (to suit the inhabitants) by the behaviour of people. The success of the settlement for the people hence cannot be measured with the availability of contacts identified in the instrument (which was developed looking at the maximum potential contacts in the planned settlement) but with the sustenance of the social system of biradari and culture which was the most important factor satisfying the sense of security and association with the place. The meanings they associate with the places are far more different and hence an interpretive analysis helped to evaluate and assess the settlement.

5.3 Lessons Learnt

The lessons learnt from the research in terms of myths falsification and interesting discoveries.

5.3.1 Myths falsified by research

The research revealed reality of certain insights and myths regarding the planned and unplanned human settlements.

Myth 1: **The apparent pattern, form and order determine the success- planned settlements are successful compared to the unplanned settlements or vice versa**

Although the apparent pattern, form and order have a valid importance in the shaping of the mental patterns and have been observed and tested through the brief survey, yet they are not the sole elements that determine the success or failure of human settlements. The organization of the space is very important and is also highlighted by the residents of the planned sector G-6, according to whom the irregular pattern of the roads in Bhara Kahu makes them insecure and infuses a fear of getting lost or becoming a prey to the criminals in the area. However, these infused perceptions seem relevant for a not so frequent visitor to Bhara Kahu.

The research showed the quality of built environment which is also dependent on the governance to be important as well. The residents who were mostly satisfied with the Doxiadis' planning of sector G-6, existence and ease of contact with nature, people and places, complained of the maintenance of facilities provided and issues of governance.

The area of Bhara Kahu as compared to the developed sector of G-6 is assumed to be remote, by people who do not live in the organic settlement of Bhara Kahu or frequently visit such places and are unaware of the way of life in the settlement. It is considered a distant and a

bewildered part of Islamabad which is not so true. Another perception about the area is the high criminal incidence and low standard of living in Bhara Kahu. On the contrary it was found that residents in this area are comfortable and live according to the norms of the area feeling rather safe within their own territories because of strong social ties in the area. It was also discovered that these areas have a diverse combination of socio- economic and cultural groups which enriches the settlement and people preferred to live in that area not only for economic reasons but also as it is closer to certain facilities like the Murree expressway (which is a corridor for connectivity to the northern areas of the country), the recreational spots like Shadra, the Rawal lake and Simly dam and research institutes like the Quaid-e-Azam University and Pakistan Institute of Economic Development (PIDE). These are more important to the residents and their perception of satisfaction with the Ekistics principles and the organization of spaces hence varies.

The study revealed that the organization of spaces (like the irregular, organic plan) does not necessarily have a causal relationship with the safety issues but it does generate a perception of unsafe environments. It also showed that these perceptions are based on the awareness levels and the myths related to the environment by people who generally are distant to these places.

Bhara Kahu has been socially successful for the local settlers who have been living here generations and for whom the needs pertaining to the settlement are shaped by themselves and are thus satisfied. The locals are conditioned in the feudal and biradari system and the physical patterns have evolved due to local conditions and individual and collective preferences like sub division of land for the increasing family or income generation.

Myth 2: **Planning has failed and emergent and organic settlements guided by self-organization are the idea of development dominating the twenty first century**.

The debate on the planned versus the unplanned human settlements in the past few decades has been a never ending struggle. Contrary to general perception, it was found that both the planned and the emergent, organic human settlements and their co-existence like in the case of Islamabad play a very important role.

The original master plan had clearly defined the functions of the planned and the unplanned zones of the city based on the potentials of the zones and the idea of a sustainable future for the city of Islamabad. The city of Islamabad works like an ecosystem with the National park area serving the city as a backup for provision of water and food needs.

5.3.2 Interesting discoveries

During the research interesting discoveries were made. This section briefly explains the ones relevant to the study.

Discovery 1: The culture - Development vs. evolution:

The settlements are characterised by contrast in the development (of G-6) and evolution (of Bhara Kahu) but this feature has not changed the way cultures in both the settlements have evolved and sustained. The social culture evolved in a unique similarity in both the developed

and emergent settlements into a biradari system. It is evident that this particular example reveals the regional base for the social development of a settlement and is seen to affect the psychological patterns of the society also in similar fashion. However, due credit is given to the physical design of the settlement (which comprised heterogeneous community) that aided the evolution of a culture that is typical of homogeneous communities in the region. The social system is the most important element for the settlements which predominantly provides a psychological security to the people.

Both the settlements have strong social bonding within the old settlers in the respective settlements. It is the way of living of people of the area and a wider culture of humans of enhancing and maximizing their protective environment (third principle of Ekistics) while maintaining the maximum contacts (First principle of ekistics). The social network developing into a biradari system in both the settlements is seen to be a strong element of maximizing the protective space of the people by giving people sense of protection and support within their neighbourhoods. This is a visible outcome in both the planned and the unplanned settlements.

Discovery 2: Definition of needs and chance factors (place, events, time, availability, capacity, changes in individual preferences etc.):

The second discovery, which is rather complex and needs further research through behavioural psychology and social sciences, of how the needs (pertaining to the settlements) are affected and sometimes defined by the chance factors in the contrasting situations of both the settlements. The survey findings and analysis lead to the conclusion that the people are conditioned to define the needs according to their exposure, awareness, education and existence or non-existence of facilities and opportunities. For example, in the sector G-6 the existence of the children's library in the past (from 1960- 2005) and its awareness led to most residents having used this library. However, the non-existence of the library only affected the previous users of the library who appreciated the facility but with the passage of time got used to and conditioned to its nonexistence and the culture of libraries perished. However the new library and reading room constructed in the year 2010 at another location in the same G-6 sector, remains incomplete and unused to date. The culture of libraries and hence definition of the need was seen to be non-existent in the Bhara Kahu completely. Similarly the events, incidents and individual and sometimes collective preferences also contribute to the needs. Another example from the G-6 sector is the Lal masjid operation in the year 2007 in which the main mosque was destroyed but rebuilt in 2010 because of people's personal preferences and religious obligation which people felt towards it. However, the Children's library that was lost due to this mosque's encroachment was not considered important to be saved. These are examples of the chance factors shaping the cognitive pattern (shaped by the awareness, education, place, culture, environment, events, religion and several other features) which in turn also shape the environment.

The basic needs identified by the five principles of Ekistics remain valid for both the planned and the unplanned human settlements. The only difference can be to maximize contacts with preference to certain needs according to the exposure, awareness, education, opportunities and the prevailing culture.

Discovery 3: Environmental behaviour

Role of spatial structure and facilities in citizens' education, individual, social and cultural development

Another very important discovery related to the social sciences' field of environmental behaviour (i.e. environments shape behaviour) linked to the previous discoveries making a chain is that the provision of facilities, exposure and provision of access to the same improves the level of the citizens' awareness, education and appreciation of the same thereby shaping culture. The residents of the grid-iron planned sector G-6 were seen to be more aware of the benefits of the spatial structure (straight roads, hierarchical system of streets and road network, hierarchical system of the urban and public facilities provision etc. and a fair distribution of the facilities within easy access) though all did not have a background of planning or very high education yet their understanding of the environment and appreciation of the visible order was high which was the result of personal observation and experiences and believed to have been enhanced through the provision of such a spatial structure which is not available elsewhere. Hence the grid-iron plan given by Doxiadis is seen to have played a very important role in educating the citizen.

Reflection of spatial planning contribution can be seen in people's responses to the layout of the planned and the unplanned settlements. The grid-iron plan has created awareness and has developed a sense of physical security by the hierarchy of road network.

The study revealed a lack of direction and physical order in the organic layout of Bhara Kahu area which has led to a negative perception and fear amongst people living outside the area. The system has become complicated to such an extent that it is out of control of even the development authorities.

People of the region (whether the citizens or the development authorities) are not yet trained and have the capacity to be able to handle the freedom in development bringing a balance between man and man-made environment. The Doxiadis plan is the only experience people have had of a grid-iron plan and this has led to the increased awareness of environment, understanding and developing of needs, civilizing the society. It has also enhanced the knowledge in the field of planning but this area needs further improvement with respect to the civic authorities not only focused on implementing the physical plan but also integrating the local cultural and social values for a greater development of public welfare, enhancing the awareness and potentials of people and hence a successful (Doxiadis, 1968) and positively performing (CSIR, 2000) development of the human settlements.

One noteworthy mention related to the culture is the male dominance in both the settlements. It is already known that the region has a patriarchal system but the way in which both the settlements showed the space boundaries being defined for women was identical. However, Doxiadis being aware of the culture in the region provided an exclusive enclosed ladies park in the sector G-6 which despite of the unspoken norm which does not accept the women going to parks, has facilitated and encouraged women to use the park and bring small but important changes in the social culture. Hence planning in this case has seen to have helped the weaker sex in using their citizens' rights to use the public space.

Initiative for personal, social, cultural and physical development

Another relevant and important discovery related to the human and spatial development in the human settlements is that the initiative taking capacity of citizens regarding needs in a settlement is largely affected and altered (diminished or enhanced) by the fulfilment of the basic needs and the socio-economic conditions of the people hence it affects the intentions, ambitions and focuses in case of developmental concerns which in turn affects the patterns to some extent. The people are also seen to have been conditioned in a way that they are highly dependent on the provision of facilities and services from the government and lack self-organization and initiative to solve problems or improve the conditions they complain about. They have great adjustability and adaptability for all conditions (good and bad) and rely on decisions and actions by the government. People who are not trained to take decisions for years by living in environments shaped by the governments without them being involved lack the capacity to take initiative.

The freedom that people of the unplanned and unmonitored settlement of Bhara Kahu enjoy as compared to the planned sector G-6, shape their own environments by taking decisions in their personal interests affecting the wider settlement patterns. The people with better economic conditions have constructed private roads and also a few services for themselves. The freedom to create their own environments in Bhara Kahu has cultivated a special sense of place that has sustained for the residents and hence mental maps for an invisible rational order within visible disorder and a logical protective space.

5.4 Relevance with Literature

The research is linked back to the literature review carried out for the research, the starting point of which was to plan or not to plan debate, the arguments in favour and against planning and a middle path advocated by Hamdi (2004). The case study of Islamabad provided with practical application of two contrasting patterns of settlement (planned and unplanned) co-existing side by side. Hamdi's pretext of importance of both structures (planned and the ones enabled to emerge) and finding a balance between the two has been practically and deliberately implemented in the master plan of Islamabad by Doxiadis. The city hence is seen as an eco-system with multiple co-evolving elements as argued by Marshal (2009).

Marshall's argument of instincts vs. arguments against planning and relevance to the context of case study in the human settlements of Islamabad:

The research showed that although settlements can be a product of human instincts (like spontaneous settlement in the case of Bhara Kahu in Islamabad) the idea is better represented and expressed through the principles of Ekistics which are based on human needs and instincts.

This research however challenges Marshall's (2011) anti planning argument that "*a new modern planned and purpose-built city is not necessarily more attractive, functional or successful than the other one* (traditionally unplanned) " on the argument that they are '*perceived*' to be '*worse*' as they are "*anti-humanistic*" with "*alienating environments, with*

ugly, brutal concrete jungles, landscapes of barren tarmac, looming slab blocks and gloomy undercrofts" (Marshall, 2009).

The planned settlement that was represented by the case study of sector G-6 has proved the argument to be wrong as it is not "perceived" to be in any sense "worse", "anti- humanistic" or "alienating environment" by the residents who have lived and experienced the environment (and whose perceptions were measured through the research) or who have visited and judged the environment. On the contrary it was found to be attractive in many ways (already discussed in chapter 4), functional and declared successful by not only the planners but also the residents who are the most important evaluators of the settlement. The planning has had profound positive impact on shaping the human behavior and satisfying human needs and instincts.

The unplanned emergent settlement of Bhara Kahu however has its own merits, attraction, functionality and perception of success in the minds of the people but cannot be declared 'worse' or 'successful' with its beautiful natural landscapes admired widely, or its humanistic evolution (being a product of human instincts) as it is "perceived" to have an alienating environment for the non-locals in some cases producing insecurity for them.

The geometry and the landscape widely criticized in planning by Marshall (2009, 2011) and Lynch (1981) and many others for not satisfying human values or playing a noteworthy role in the contentment of human needs, has on the contrary (in the case of planned sector of G-6) helped in ease of access to a wider public to suitably located various points of contacts within the settlement satisfying human needs explained by principle 1 and 2 of the Ekistics.

The concluding remarks on the research related to the literature are best represented by Mooney, Pile et al (1999) claim that urban plans can be consciously produced and socially ordered.

The concept of the Dynapolis and the theory of Ekistics have provided the answers to the missing link between plan or not to plan and to the complexity-cognitive approach to planning sought by Portugali (2011). It has provided model for the development of human settlements, the practical illustration of which can be seen with reference to context in more than 40 countries of the world.

Hence the theory of Ekistics and the concept of Dynapolis is the best representation of ideas and a practical link between theory and practice.

5.5 Limitations Strength and Weaknesses of Research

The Islamabad city is a combination of the grid-iron planned sectors spanning over an area of 55,000 acres and unplanned zone of 70,000 acres approximately. Sector G-6 is one sector taken as a sample from the zone 1 to represent the grid-iron planning and assessment of ekistics principles. The other sectors though have common characteristics particularly the 2 x 2 km square and the concept of markaz (centre) and the sub divisions of the sector, but this particular sector is somewhat different as the socio-economic and cultural diversity is perhaps the most significant feature of this sector. Hence the study covers the concepts validity for different socio- economic groups living in the area. However due to limitation of time and

scope different sectors could not be assessed which may show disparity. This view comes up in the observations of the researcher and the respondents.

The second area which is the emergent settlement of Bhara Kahu is a very conservative area where women are generally not seen outdoors. This area is difficult to understand and access without help. The area has a mix of socio economic groups and most settlers who are the locals have a language not easy to understand.

Secondly, sensitivity due to the previous critical incidents in the area, the presence of sensitive institutions and the fear and suspicion people carry due to unfavourable past experiences, limited the data collection (photographs) and hence findings. The analysis had to be based largely on the interviews conducted during the research as the reliability of the questionnaires was low with contradictory answers to questions posed differently but aimed at finding one thing and the triangulation helped see the differences.

However this is another strong point in the research finding that these critical incidents have affected the population and the patterns. Generally people were not comfortable with recording of interviews and reluctant to give out written and sometimes oral information. The general public were highly suspicious for the areas being photographed.

Thirdly, the country is going through a very serious energy crisis and frequent (12- 14 hours) load shedding and limited access to the internet also posed problems. Recent elections and bombing, targeted killings followed by strikes brought the city life to a standstill which wasted time. Accessing files and documents from the archives was a challenge which was overcome through contacts.

5.6 Recommendations for further research

The Ekistics and the Dynapolis are theories and ideas based on extensive research by hundreds of competent scientist of the postmodern era. The scope of this study due to the limitations of time is limited and ideally required more case studies of the deviant and typical cases in order to understand better the limitations and implications of the theoretical postulates of Doxiadis. However, two recommendations for further research are suggested.

First, a similar study of all other areas i.e. the developed sectors of zone I and II and the other areas in zone IV must be carried out at the level defined by Doxiadis Ekistics Logarithmic scale classification of micro settlement and evaluate the areas with gaps and problems.

Secondly, a detailed study of the institutional and organizational capacity must be carried out for the CDA and the relevant departments.

Thirdly, the study can be integrated into broader context of the Dynapolis of Islamabad and decisions for welfare of a greater region.

"Planning of Islamabad and Rawalpindi: What went wrong" (Maria and Imran, 2006,) shows the CDA had a much stronger capacity and hence the development in Islamabad was successfully implemented as planned, while the RDA could not. However today situation seems to be repeating the history in the Islamabad park area where CDA has made land use revisions which are not in accordance with the Doxiadis vision of the city of future and his

planning for a sustainable city. The ICT and CDA have managed so far with two revisions of master plan reviewed by the Doxiadis Associates and hence have had results that the city has been considered as a success by the original planners. However the issues of governance and the lack of understanding of Doxiadis theory and the city plan are major problems which if not catered for will collapse the system of the Dynapolis. A KAP (knowledge attitude practice) of the institutions like the CDA study is also recommended.

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Annexes

Annex 1- Literature review

- Matrix of theories and concepts-1
- Matrix of similarities and differences-2

Annex 2- Operationalization

Annex 3- Schedule for field work

Annex 4- Questions for semi-structured interview of residents

Annex 5- Questions for structured interview of planning experts

Annex 6- Photographs of research area

Annex-7- Tables of findings

Annex-8- Maps and Drawings of research area

	Doxiadis, C. A. (1968-1970)	Marshall, S. (2009-2011)	Portugali, J. (1997-2011)	Hamdi Nabeel	Remarks
Literature 1 **Articles/Lectures**	Ekistics- the science of human settlements(Doxiadis, 1970)	Self-organizing cities(Marshall, 2011)	Self-organizing cities(Portugali, 1997)	(Hamdi, 2004, Hillier, 2012)	
Literature 2		City Planning, Design and Evolution Concepts(Marshall,)	Complexity, Cognition and the city. Review by Ashley Dhanani		
Literature 3 **Books**	Ekistics book	Cities, Design and Evolution(Marshall, 2009)	Complexity, Cognition and the city.(Portugali, 2011)		
	This is The research is seen from three different perspectives. Starting with the ideas of Doxiadis who is the founder of Ekistics theory and also the architect and planner of the city of Islamabad. The city is still considered one of the best in the country and after more than half a century thrives. And like many other new towns of its era demands a further look into the future growth to accommodate the current needs while maintaining the city's unique character, ideas and concepts behind the design if they still fit in the context, or if they need to be tamed. As Doxiadis has said himself, "We can only learn about the human settlements from the human settlements themselves." Ekistics is seen as the integrated approach bringing studies from distinct points of view from various disciplines into a coherent framework. The study tends to explore the newly projected concepts and ideas through the case study of Islamabad as manifestation of Doxiadis Ekistics theory. The second idea has been taken from the latest image or trend of the 21st century the ideas of Self-organization and emergence. The third idea is taken from Nabeel Hamdi who argues that both planned and emergent urban development is required.				
Theories	**Ekistics- the science of human settlements**	**Organic & traditional cities-** **Self-organizing cities**	**Self-organizing city** **Haken's synergetic theory and Prigogine's dissipative structures theory.**		
Key concepts	**The principles man takes into account when building his settlements**, as well as the **evolution of human settlements** through history in terms of size and quality. The target is to build the city of optimum size, that is, a city which respects human dimensions.(Doxiadis, 1970)		**Herman Haken's theory of Synergetic-** Emphasis on **inter relations, interactions and synergy** among the many parts of the system and its **overall structure and behaviour.** **The phenomenon of collective behaviour.** **Look for changes at the macroscopic scale.**(Portugali, 1997)	**Integrated approach and stressed the need for nurturing of wisdom, skill and competencies in practice**	
	Integration of theories from various	**Complexity theories**	**CTC- Complexity theories of**		

		cities Using Henri Benard's experiment of heating liquid from below.		
	The 5 principles of Ekistics: I. **Maximization of man's potential contacts** with the elements of nature (such as water and trees), with other people, and with the works of man (such as buildings and roads). II. **Minimization of the effort required for the achievement of man's actual and potential contacts**. He always gives his structures the shape, or selects the route, that requires the minimum effort. III. **Optimization of man's protective space**, which means the selection of such a distance from other persons, animals, or objects that he can keep his contacts with them (first principle) without any kind of sensory or psychological discomfort. IV. **Optimization of the quality of man's relationship with his environment**, which consists of nature, society, shells (buildings and houses of all sorts), and networks (ranging from roads to telecommunications). This is the principle that leads to order,	**Four pairs of key concepts:** 1. City design versus urban order 1.1 **Urban order** refers to the **consistency of urban components and their relationships** 1.2 **City design** refers to the design or planning of a city in a definite form at a given point in time, as a finite, whole unit 2. Corporate versus collective 2.2 A **Collective** entity is an aggregate of many individual components, where each component has its own purpose that is not subordinated to purpose of the whole 2.1 A **corporate** object is a unitary whole composed of complementary sub-units. 3. City as **organism** versus city as **ecosystem** 3.2 The city as **ecosystem** interprets the city as an organic, collective entity. 3.1 The city as organism implies that a city is an organic, corporate whole 4. City development versus urban evolution 4.2 **Urban evolution** implies that	**The two patterns of the structure of the city:** 1. Material pattern of the city 2. Cognitive pattern of the city **Cognitive science** The human subject is presented as a cognitive being **that seeks to understand the city and through this process creates the city.** Analogy between **pattern formation and pattern recognition** specifically attractive to the study of cities. Both are related to the cognition and brain functioning. Individual's cognitive maps determine their location and actions in the city, and thus the physical structure of the city, and simultaneously affect the individual's cognitive maps of the city.{{68 Portugali, Juval 1997}}		The debate focuses on **the patterns that is planned (usually geometric) and unplanned (mostly organic)**. An interesting feature of the human mind is creating **patterns that are mostly geometric** although it is considered that the cities are creation of social and economic and sometimes political processes, but in this case **function follows form**. Bill Hillier's article has sought to **understand this behaviour of imposing the geometric order into the cities,** regulating every function within that envelope and relations between objects and spaces.(Hillier, 2012). We see the Doxiadis design of human settlements in this light with his explanation of the design and Portugali's material and cognitive patterns of the cities.

	physiological and aesthetic, and that influences architecture and, in many respects, art. V. Finally, and this is the fifth principle, **man organizes his settlements in an attempt to achieve an optimum synthesis of the other four principles,** and this optimization is dependent on time and space, on actual conditions, and on man's ability to create a synthesis. (Doxiadis, 1970)	**urban change over time is open-ended.** Like an ecosystem, a city is **composed of co-evolving components**. 4.1 City development implies that a city grows, like an organism, according to some kind of developmental programme or life-cycle (birth, growth, maturity, death).{{82 Marshall, Stephen}}		
Research Questions arising from the literature review	1. **Whether we are closer to the sort of knowledge integration that Doxiadis has advocated.** 2. **What is the fundamental principle of integration that ekistics proposes to bring to the study of human settlements?**	**To what extent should cities and towns be planned?** {{69 Marshall, Stephen 2009}} **Answer lies in the questions:** **Where do we want to be?**	**The need to understand the urban morphology and the relationships that change the patterns.** **What is the relation between the material and the cognitive patterns of the city?**		**The resistance to integration may be linked not only to the theoretical frameworks that have come to dominate the growth of knowledge regarding human settlements, but also the social practices associated with the relevant academic disciplines. Social and economic planning, for example, have increasingly been separated from physical design.**
Main Arguments	**Ekistics** is the science that is needed for the development of human settlements. Doxiadis advocates **sectors as the constitutive modules of large settlements** that most closely correspond to **the human scale** and **balance the dynamic growth** of the centre and of special functions. In complex settlements sectors	The argument here is that a city is better regarded as a collective entity. This implies that city planners should consider **forms of intervention that allow the creation of urban order – through individual components and their relationships** – rather than necessarily attempting to design a city as **a finite whole**.(Marshall,) **"a new modern planned and**	**Self-organization is a general umbrella for several theoretical approaches, which agree upon general principles but different treatment of systems.** **Theories of self-organization applied to the domain of cities, a 21st cent. Phenomenon and in an age of high complexity it can**	**Importance of both, structures designed and that are enabled to emerge,** to think much larger, more strategic and find a balance between the two. There is no perfect theory, no perfect practice and no one ever knows it all. Challenge consensus or search for truth.(Hamdi,	**The controversial plan or not to plan debate inspiring the research. The latest trends which are anti- planning cannot undermine the brilliancy of the planning science introduced as ekistics more than seven decades ago and bearing**

	would be arranged hierarchically around higher - order urban centres.	**purpose-built city is not necessarily more attractive, functional or successful than the other one**"	**help us guide our actions.**	2004)	**practical examples of living cities in twenty first century.**
Similarities/ additions	We cannot acquire proper knowledge about our villages, towns and cities unless we **manage to see the whole range of the man-made systems within which we live,** from the **most primitive to the most developed ones** - that is**, the whole range of human settlements**. (Doxiadis, 1970)	The urban change is more like **evolution than development**, and planners should pay attention to the **mechanisms by which urban evolution could be steered** through **a combination of generative processes and selective controls.** (Marshall,) Looking at **the cities of the past** and evolution.	To **understand what a city essentially is** (Review on Complexity, cognition and the city by Ashley Dhanani) and a model of urban processes applied as method of modelling the way city functions and grows through its **informational structure.** **Evolution of cities-** looking at **cities of the past.**		Emphasis on the **need to understand and see the evolution of the cities.**
	Understanding the **urban morphology and relationships** that change the patterns	Understanding **urban morphology** and **linking urban design and planning practice**			
	The whole range of **human settlements, is a very complex system of five elements** - nature, man, society, shells (that is, buildings), and networks. It is **a system of natural, social, and man-made elements** which **can be seen in many ways** - economic, social, political, technological, and cultural.(Doxiadis, 1970) **Human settlements are very complex biological individuals**.	The city as a **Complex, dynamic** and **collective entity,**	The **acceptance of the existence of complexity** (Portugali, 1997)		**Agreement of the complexity issue and complex nature of the city. The role of complexity in the urban planning and it's failure and success dependence.**
	Refers to the design and planning of settlements as **"physical artefacts".**		Terming the cities as **"artifacts",** admitting **the creative abilities** of humans and associating this quality only to humans(Portugali, 2011, Portugali, 1997)		
	Human settlements have been **created by man's moving in space** and **defining the boundaries of his**	**Individual decisions will structure the mega-city**. Like in the beehive this will create **a form and structure**	The city is **evolving, changing and moving** as a **consequence of the movement and actions of**		2. **What forces affects the city dynamics?**

	territorial interests and therefore his settlements for which he created a **physical and institutional structure.**	addressed to all individual needs.	individuals, firms etc. that give rise to the order parameters which **determine the structure of the city-**		All agree that **the city or human settlements are in constant motion and growth and it's an evolutionary process that requires us to see the behaviour of actors rather humans whether in a conscious effort or in the emergent nature of human settlements.**
	Ekistics is derived from evolution and **man's instincts and laws he always obeys** in creation of his space.	**Organic cities**- the **principles that work in nature**, like beehives- **the product of the individual instincts of all** bees involved.	Looking at the very first city- Neo Darwinian theory- **human instincts** to protect his food, himself etc.-----		Nature, values and trends may change but the **biological characteristics especially the instincts don't change**. Hence the ekistics forms the basis of all developments.
	The fourth principle which is the optimization of quality of man's relationship with his environment consisting of nature, society, shells and networks; **leads to order**, psychological and aesthetics and influences architecture in many ways.	Although **a master plan may promise order rather than chaos**, it may be **too rigid** to have **a fixed physical product** at a given time in the future, but it may be **preferable to have something whose overall form is not fixed in advance**, but whose components exhibit ordered relationships, that ensure flexibility and functionality into the future.(Marshall,)	Benard's cells **become a source of order**. They are essentially a reflection of the global situation of non- equilibrium producing them.(Portugali, 1997)		Questions arise about the **perceptions and derivations of order** and their relations with **the existing spatial patterns**. According to Mooney, (1999) Order or disorder can also be seen in multitude of ways and it's all about perception.(Mooney, Pile, et al., 1999)
	Time to **determine success** as time helps us learn more and more. P.2, 1970	Gives **three evolutionary urban scenarios** partly **dependent on the timescale** of the perspective. There are **temporal factors** relating not only to the long timescale- of the construction of a settlement but also the way that design, construction and occupation are overlapping. P.263 (Marshall, 2009) The **time dimension**- related to	The whole thing is a matter of time. **Time helps us learn about control parameters of our cities**.	**The fourth dimension** where the strictest problems lie. **.**(Hamdi, 2004)	**Time as an important consideration and as the main learning.** **This factor can be used to test the theories and ideas to measure the success.**

		predictability and long-sightedness versus uncertainty and choice.			
	Old cities admiration and acceptance of existence of science of planning.		Old cites admiration- images related to strong feeling of stability, civilization, law and order. Also acceptance of existence of planning		
Differences/ Additions	There is no point in resisting development; Try to **accommodate technological evolution and the needs of the man within the same settlement.**	• **Against a finite design of settlements.** Cities possessing some kind of 'organic' quality that is not found in designed objects such as **artefacts**, machines or individual buildings. Refers to them **anti-humanistic (i.e. "alienating environments, ugly, brutal concrete jungles, landscapes of barren tarmac" etc.).**(Marshall, 2009) • favours emergence • Believes in **co-evolution**.	The **cognition** of those who inhabit the city, requires "**complexity- cognitive approach to planning**" (Portugali, 2011)	the need to understand **natural scales and limits**	**Man's ability to create synthesis takes us back to the complexity and cognitive science.** So, it's about **perception and cognitive capability of humans,** including the **complexity** understanding and dealing with it?
		Uses **evolution as a useful paradigm (as adaptive emergence which allows increments of design)** for interpreting **the complex, dynamic, collective entity** that is the city and urban change, including the change arising from urban planning and design. (P.245)(Marshall, 2009) The components of evolutionary paradigm: plans, patterns, codes, standards and guidelines.		Favours the **fourth dimension, spontaneity of actions, incremental building, improvisation, understanding systems, networks, people, places, politics and resources and reduce reliance on preponderance and complete information**.	**Cities have to be timeless. They are not made for specific lifespans. Hence they involve farsightedness, and adjustability.** **This does not mean 100% predictability but acceptance that the unforeseen and predictable new forces entering the game will change the course and hence need to be accommodated than resisted.**
	New Forces entering the game affect the process. Forces are taken as the **human needs pertaining to settlements that affect the settlement form.**		**External forces acting on the system** do not cause determine its behaviour but instead **trigger an internal and independent process** by which the system spontaneously SO		

		itself.(Portugali, 1997)		
		Applying the concept of self-organization in urban planning encompasses changes in the present day planning approach.		
		Emergence shows we can have creation of recognizable order even if there is **no design, planning, forethought or conscious intention.** Individual actions may be conscious and purposeful but this does not mean that the **emergent effect is necessarily intended or anticipated**. **Patterns emerge from the behavior of actors** following local rules. It is not the local actors or actions that are doing the emerging. **Emergence is rather an indirect effect of individual actions, observed from a suitably zoomed-out spatial or temporal scale** (Marshall, 2009)		
	Doxiadis introduced an Ekistics Logarithmic scale that is composed of **15 ekistics units** for explaining different scales of human settlements. It can be considered as a basic **tool** for **the study of synthesis in space, which is basic characteristic of morphogenesis of human settlements**.	**Marshall introduces 'Urban Coding'** as a way to give **tools** to this new planning concept. A set of yet undefined 'codes' that leave enough **room for people to act according to their own interes**t, but that also have restriction to not let everything become a mass. People should be able to build upon that code. **Individual decisions will structure the mega-city**. Like in the beehive this will create a form and structure addressed to all individual needs.		

Annex 2- Operationalization (Development)

OPERATIONALIZATION:	
Variables	**Indicators**
URBAN MORPHOLOGY	Design or planning of the settlement. Unplanned? Planned? Ill- defined? Well- defined? Finite?
Character of the urban area	Emergent, Organic Evolutionary Developed
ORDER • **Visible** (Physical) In both natural and man-made objects	The **consistency, uniformity or regularity** of urban components (primary, secondary, tertiary) and their relationships. **Quality of** man's **relationship** with his environment consisting of nature, society, shells and networks- (Fourth principle of Doxiadis- leads to order- psychological and visual) **Hierarchy of functions** **Hierarchy of roads, units** etc. **Co-ordination** between system of independent activities **Continuity** **Visual sequences** **Elements** of ordering (as landscape, orientation and geometry) Transition
• **Invisible** (Cognitive, Social, Psychological)	Invisible order within visible order Rational order (will of masses) Social order Socio-spatial configuration of space defined by relationship of man and environment , rhythm (of long periods of steady state during which a system evolves itself- Portugali, 1997)
PATTERN • **Material Pattern** The absolute space (classic view) The relative space (modern period)	(Characteristics- physical, real, material, divided, functional, autonomous, positional, measurable, typological, ordered and 3D visualized.) **Physical structure** (existence of pattern and hierarchy of urban spaces, street systems, built fabric, functional and organizational structure,) • **Topography** • **Patterns of movement** • **Patterns of functions, spaces, solids and voids** • **Distribution of services and activities** • Radial, circular, hexagonal, organic, repetitive, • Functional mix • Accessibility • Connectivity
• **Cognitive Pattern** The relational space- (not simple to measure and quantify) Underlying -(associated with human activities and behavior) Instincts? • **Pattern formation** • **Pattern recognition**	**Mental Maps** (Characteristics- real, informational, virtual, operative, reactive, typological, tactile with synergy and 4D attributes for decision combinations in dynamic systems) Relationships created in time, process. The creation of space, its designs, planning and functionality within that creation. (Individual's **perceptions of – order and chaos, organized and disorganized, rigidity, flexibility, safety, protection, definition of boundaries of territorial interest, private and public space**, determines their location and actions in the city, and thus the physical structure of the city, and simultaneously affect the individual's cognitive maps of the city. Patterns emerge from the **behavior of actors** following **local rules**. (Marshall, 2009)- **Local rules, cultural, social, traditional values,** etc. (feudal pattern of land ownership etc.) Interaction } shock absorbing capacity for socio-spatial crisis

	Interdependence
	Frequency of socio-spatial crisis,
	Intensity of socio-spatial crisis
	Space of flow, compatibility with personal vision, spatial understanding and aesthetic criteria of man. (considered as hypothetical and as model of knowledge, separately from its emitter and receiver)
	Socially constructed, complex in process, space-time convergence
	Urban Coding or scale? Mohalla, biradari/ community
FORM	Affected by circumstantial forces such as topography, growth
	Results from the combination of central, linear and circumstantial forces.
• **Apparent -** Physical	The outer framing of space, the physical form of shells and networks
	May be **linear**, with linear forces
	May be **curvilinear** and in **concentric circles**, due to centripetal force
	Organic, generic, grid
	Permitting free, natural expansion/ expansion affecting existing patterns or not
	Unidirectional along an axis? **Multi directional**?
	Balance of solid and void-imbalance or **balance of development**?
	Interlocked or independent layers and levels
• **Underlying-**	The outer apparent form may conceal the underlying structure.
	Like the grid may conceal the linear or central organization
FORCES	Human **needs** pertaining to settlements that affect settlement form (the focus mainly on the social, psychological and the physical).
	Can be associated with surfaces and volumes
	Interplay of forces comes to rest with balance of intensities and direction. (Ekistics), Portugali's socio-spatial stability
• **Internal forces** (Defined by man's natural force)	Human **scale**-space (Anthropometrics)
	Human **tradition**- time (centuries old traditions in the area like- Harappa etc.)
	Dimensions such that the man can reach the center without walking longer than 10 minutes/ 2000m-
	Related to the second principle of Ekistics (minimum effort)
	Scale, Distances and dimensions
	Conflict or no conflict between man and machine (e.g. No conflict In grid)
• **External forces** (Defined by machines and affected by size of the whole) linear, central, circumstantial forces	(In certain situations external forces acting on a system do not determine its behavior but trigger an independent process- Portugali, 1997)
	• **Dimensions of the whole** (containment and collection of manageable sizes of urban area), optimal size? Sectors and series
	• **Lines of transportation, Distances, accessibility,**
	• **Existing Centers of gravity**
	• **Linear** (away or towards) can ne straight or irregular line such as major roads leads to creation of linear parts
	• **Central** (centripetal or centrifugal)
	• **Circumstantial** (topography, greatest attraction and least resistance, growth, historical etc.)
TIME -The fourth dimension	Urban scenarios related to time
	Spectrum of time- past, present, future
	Starting point- existing trends, situation
	End points- furthest future through assumptions
	The **time dimension**- related to **predictability** and long-sightedness versus **uncertainty** and **choice**.
	As an element in design, time must influence the very basis of its **conception**, its **formation** as well as **physical expression**.
	Urban change in time **open ended**
CHANCE FACTORS	Place, Events, incidents, Occurrences, time, risk
	In deterministic nature of reality. Conditions
	Changes with individual preferences
	Process indicators on implementation competence that are highly influential

	to outcome delivery
	Capturing Capacity issues
OUTCOMES • **Visible** (measurable)	Outcome indicators • Plan derived? Indication that the pattern is influenced by the plan • Object derived? • Reflection of spatial planning contribution? • Urban resilience reinforcement (by connectivity of networks) • Urban efficiency • Patterns- Radial, circular, hexagonal, organic, repetitive • Chaos (from irregular movements or behavior) • Order • Functional mix • Distribution of population? • Assembly –coordinated? • Accessibility • **Emergence**- an indirect effect of individual actions, observed from a suitably zoomed-out spatial or temporal scale • **Evolution** (urban change over time, open ended and composed of Co-evolving components) **or development** (growing like an organism according to some development program or life cycle) • **Collective entity** (aggregate of many individual components, not subordinated to the purpose of whole)**or corporate object** (unitary whole of complimentary sub-units) • Scale
• **Invisible** or softer outcomes (Not simple)	Related to cognitive patterns and relational space Role of the basic urban cell at the lower scale of ELS (Ekistics Logarithmic scale)/grid within a larger urban complex- The Dynapolis- the city of the future Sense of well being Connectivity- physical First principle of Ekistics Connectivity- social (Social integration) Fluctuations in major urban system due to local instabilities coinciding in time? Cultural diversity, appropriable by residents, Structured as? (Ecosystem? organism?) Individual decisions or collective entity? Creativity
Complexity (property of both physical and social)	Self- generating, self-propelling Conjunctions of local conditions and generic patterns Hampering by events, occurrences (chance factors) not in the realm of human control Societal complexity due to social complexity, social reality. The lack of human capacity to process large information, Numerous inseparable parts (hence difficult to establish causal relations) Interconnectedness, Nonlinear- non determinacy and unpredictability Networks Interdependence- depend and influence each other Unforeseen happenings leading to unforeseen outcomes leading to reactions to chance factors. Reactions for favorable and unfavorable circumstances.
Categories for observation explanation • **Epistemic complexity** • **Ontological complexity** • **Functional complexity**	 Descriptive Element Typology and relations Functions, workings of elements and their mutual relationships (which are changeable over time)
• **Control parameters**	•Control parameters- time related- like growth, population pressure (can

• **Order parameters** • **Attention parameters**	only be post factum- Portugali, 1997) •Order parameters •Attention parameters- five senses of the human. Mind attentiveness for the generation of information
Four key concepts of Marshall? **For emergence, spontaneous and organic cities** **Four pairs of key concepts:** 1.City design versus urban order 1.1 **Urban order** 1.2 **City design** 2. Corporate versus collective 2.2 A **Collective** entity 2.1 A **corporate** object. 3.City as **organism** versus city as **ecosystem** 3.2 The **ecosystem** 3.1 The **organism** 4.City development versus urban evolution 4.1 **City development** 4.2 **Urban evolution**	1.1 to the **consistency of urban components and their relationships** 1.2 the design or planning of a city in a definite form at a given point in time, as a finite, whole unit 2.2 an aggregate of many individual components, where each component has its own purpose that is not subordinated to purpose of the whole 2.1 A unitary whole composed of complementary sub-units 3.2 The city as **ecosystem** interprets the city as an organic, collective entity. 3.1 The city as organism implies that a city is an organic, corporate whole 4.1 cities grow, like an organism, according to some kind of developmental program or life-cycle (birth, growth, maturity, death). 4.2 **urban changes over time are open-ended.** Like an ecosystem, a city is **composed of co-evolving components**.
EKISTICS PRINCIPLES 1. **Maximization of man's potential contacts with the elements of nature, with other people, and with the works of man.** 2. **Minimization of the effort required for the achievement of man's actual and potential contacts.** 3. **Optimization of man's protective space.** 4. **Optimization of the quality of man's relationship with his environment, which consists of nature, society, shells, and networks.** 5. **Finally, man organizes his settlements in an attempt to achieve an optimum synthesis of the other four principles, and this optimization is dependent on time.**	1.1. The selection of **a scale, size** and **dimension, distance from** (water and trees, buildings and roads, schools, work places, people) that he can keep the **contacts** with them. 1.2. Connection of different urban scales/ Ekistics units 1.3. Accessibility and Networks 1.4. Patterns of living 2.1. (He always gives his) **structures the shape/ form**, or **optimal size** 2.2. Selection of the **route (minimum distances, ease of access)**, which requires the **minimum effort.** 2.3. Have greatest **attraction** and least **resistance.** 2.4. **Patterns of movement** 3.1. The selection of such a **distance** from other persons, animals, or objects that contact is maintained (first principle) without any kind **of sensory or psychological discomfort**. 3.2. The **division or distribution of spaces** and **territorial boundaries (material and cognitive)**. The personal, private, semi private, semipublic and public etc. 3.3. Socio-spatial configuration of space 4.1. The **relations between primary, secondary and tertiary elements** as objects (buildings and houses of all sorts ranging from roads to telecommunications) and spaces. 4.2. This is the principle that leads to **order, physiological and aesthetic,** and that influences architecture and, in many respects, art. 4.3. Arrangement, organization and coordination between systems of independent functions, activities, services, 5.1. Socio-spatial, temporal, cognitive- complexity approach, 5.2. Functional and organizational structure that joins both- the material patterns and cognitive patterns 5.3. A synthesis of **physical, social and psychological needs** in the first four principles. 5.4. Time line. How have these been synthesized in different periods of time. 5.5. Periods of socio-spatial stability and instability- 5.6. Connectivity (social, psychological and physical) leads to outcome in Social and urban resilience 5.7. Increased shock absorbing capacity

Annex 3: Time Schedule for field work
Table 17: Time schedule for research

S.no	TASKS	PRIOR	WEEK 1	WEEK 2	WEEK 3	WEEK 4
1.	Final research proposal submission	10-6-13				
2.	Development/ improvement of research instrument (semi-structured interview) Cross check questions. Contact list of respondents and reserves	11-6-13				
3.	Development/ improvement of chapter 2	Parallel				
4.	Mails and appointments letters for interviews and secondary/ primary data collection	12 June				
5.	Case study protocol prepare	11June				
6.	Briefing for assistant/ summary preparation, guide, semi-structured questions/ printing/ email	11-13 June				
7.	Logbook/ word files for Atlas Ti preparation with family and coding	10-6-13				
8.	Collect secondary data (Archival records, logs, maps, plans,)		X			
9.	Organize and Analyse-parallel		X			
10.	Collect primary data (Site visit, survey, semi structured interviews, photographs, etc.)			X	X	X
11.	Organize and analyse-parallel			X	X	X
12.	Check data and call again			X	X	X
13.	Further investigation if required			X	X	X
14.	Expert opinion on explanations			X	X	X
15.	Check and report thesis supervisor			X	X	X
16.	Compile all data and back up		X	X	X	X

Source: Author

Annex- 4- Questions for semi-structured and in-depth interview

Name: _____

Address: _____   Interviewer: _____

Date: _____   interviewee: _____

Can you please tell me about the History of the development of the area?
Who were the initial settlers of the area?   When and how long the development took place?   Description of the different phases of development?   Who/ Which parties involved in the initial development of the area?   What were their roles and responsibilities?   Was there government involvement or regulations?   In what stages the government focused more? Why?   Were the communities being involved in the development back then? If yes, in what stages and what activities?   What were the problems occur during the development?
What are the characteristics and roles of Bhara Kahu (in context of Islamabad)?
What is your opinion about Bhara Kahu back then (initial years of settlement) and now?   Do you see any significant differences besides the changes of the population? Can you name them?   What do you like from Bhara Kahu at that time and now?
What are the principle functions of the town, (whether they are industrial, commercial, marketing or associated with tourism)? It will examine the pattern, distribution and nature of activities throughout the zone / area and identify any problem that arise there from such as traffic congestion, lack of open space and outdated layout (just an idea)
How long you are living in this area?
Do/ did you own land in the original settlement?   Where did your family originally come from?   Do/ did you have other family, friends living in the settlement?   Were there any forests/ lakes from which you can collect resources?   Markets, clinics, recreation facilities etc. in the area?
What problem are you facing?
Are/ were you a member of any social organization?   Are/ were there any NGOs/ political groups active in the area?   What is/ was the level of community interaction in your settlement?   What is/ was your role in the community?   Do/ did you feel safe in the settlement?   Do/ did you encounter problems in your area?
How is the physical design of the area?
What issue you want to be resolved?   What is the big issue in Bhara Kahu, such as commuting, connection with the other areas, security and safety perhaps?   How does local authority deal with these problems?   Are there any complaints from the community regarding quality of services? If yes, what were they complaining mostly about?
What is the **role of feudalism in your area** and what are your **recommendations** regarding the same?
Is feudal system a benefit or a problem?   If you have to name five good things about the feudal system in your area, what would they be?   If you have to name five bad things about the feudal system in your area, what would they be?
What are the **social issues** in your town? What are the pros and cons of the same?
Are you satisfied with the infrastructure services provided by the government?
How do you commute daily?   How long distances do you commute on an average?
A description of the social, economic and physical characteristics of the area?
Recommendations if any.

Questions according to indicators for Ekistics principles:

INDICATORS	QUESTIONS

1. **Material indicators: physical structure**
    1.1. The <u>pattern</u> of built fabric
    1.2. The <u>organization</u>/ hierarchy of urban spaces,
    1.3. The <u>organization</u>/ hierarchy of street systems,
    1.4. The <u>organization</u>/ hierarchy of housing units/ different land uses
	What is the Present situation of the built fabric in the area?
	What is the present situation of organization of urban spaces, street systems and housing units/ different land uses in the area?
	What was planned for the area?
	What changes have occurred in the physical pattern of the area?
	What are the factors responsible for the change in the physical patterns?
	What is the period of change in physical pattern?
	What are future plans, predictions? What are they based on?

Ekistics Principle 1:
1. **Contact with nature Indicators:**
    1.1. <u>Existence</u> of nature (parks, lakes, forest, or open natural areas);
    1.2. <u>Frequency</u> of contact with nature.
 	
2. **Contact with other people Indicators:**
    2.1. <u>Existence</u> of public space for social interaction;
    2.2. <u>Frequency</u> of contact with such places of encounter;
3. **Contact with the built environment.**
    3.1. <u>Existence</u> of markets, schools, places of worship etc.
    3.2. <u>Frequency </u>of contact with these places
	1. **Contact with nature**
	▪ Were there in the past/ Are there any play areas for children and parks and nature reserves in the area?
	▪ Do you/ people use these places? Who are mostly the users of these places?
	▪ How many times per week do you visit these places?
	2. **Contact with other people**
	▪ Where and how do the people normally socialize? (The women, the men, the elderly)
	▪ How often do people socialize?
	
	3. **Contact with the built environment**
	▪ What places of need/ facilities (like may be markets or parks) are there in the area?
	▪ How many times per week do you visit these places?
	▪ What is the greatest attraction in the area?

Ekistics Principle 2: 1. **Effort for Contact with nature Indicators:** 1.1. <u>Distance/ ease of access</u> to nature (parks, lakes, forest, or natural areas); 1.2. <u>Modes and time</u> to access these places (walking, public transport, car), etc. 2. **Effort for Contact with other people Indicators:** 2.1. <u>Distance/ ease of access</u> to such places of encounter; 2.2. <u>Modes and time</u> to access these places of encounter; 3. **Effort for Contact with the work of man.** 3.1. <u>The distances/ ease of access</u> to the other houses, commercial areas, schools, offices, places of worship etc. 3.2. <u>Modes and time</u> to access these places	1. **Effort for Contact with nature** ▪ What are the nearest natural areas/ nature reserves, in the area? What is the distance? ▪ How do you access these areas? What modes of commutation do you use (like walking, private or public transport)? ▪ How much time does it take to reach by walking, using transport? 2. **Effort for Contact with other people** ▪ What are the nearest places of socialization, what is the distance? ▪ What are the nearest places of play, recreation, what is the distance? ▪ How do you access these areas? What modes of commutation do you use (like walking, private or public transport)? ▪ How much time does it take to reach by walking, using transport? 3. **Effort for Contact with the work of man.** ▪ What are the nearest places of commercial areas, schools, health care, places of worship etc.? At how much distance? ▪ How do you commute? Are most important places to you easily accessible by walking or transport? ▪ Which are the most important places to you that you feel should be nearest? ▪ How much time does it take to reach by walking, using transport? ▪ Where you would like to go more often? How much time does it take to walk to the nearest of the most visited

	areas?
Ekistics Principle 3: Awareness of the environment	Awareness of the environment ▪ What was it like when you first moved here? What is the difference over the years? ▪ What are the main issues or problems in the area? ▪ Do/ did you encounter problems such as drugs, alcoholism or armed gangs in your area?
The perception of safe distance	The perception of safe distance ▪ Do you feel safe and secure while you are in the neighborhood? What makes you feel safe & secure in any environment? ▪ What gives you the sense of security? ▪ Does the area give you a fear of your children getting lost if they go out alone? ▪ How far can they go alone? ▪ Do you find difficulties in going to market and moving around the neighborhood? ▪ How often you go out and reasons and places?
The distribution of the personal, private, and public space	The distribution of the personal, private, and public space ▪ What is/ was the level of socialization in your settlement? (The women, the men, the elderly)
Ekistics Principle 4: **1. Quality of Relationship of man and nature- indicators:** 1.1. The connectivity between elements of nature and man. 1.2. Influences on (quality) of nature. 1.3. Use of green spaces/ water bodies etc. as bifurcations or transitional spaces. 1.4. Awareness of surrounding natural areas/ nature reserves etc. **2. Quality of Relationship of man and society- indicators:** 2.1. The social integration and Sense of well-being. 2.2. Influences on relationship. People's perception of them and society (a part of society or apart from society) 2.3. Existence of social networks 2.4. Use of social networks 2.5. Awareness of social issues **3. Quality of Relationship of man with built environment- indicators:** 3.1. The physical connectivity 3.2. The Influences on relationship of built environment and people. (Organization, the physical quality of urban spaces, street systems, built fabric etc.) 3.3. User perception of them and the place- sense of association, ownership, belongingness 3.4. Awareness of built environment.	**Quality of Relationship of man and nature** ▪ What is the greatest attraction in the area? ▪ What do you think about the nature around you? ▪ What are your feelings when you are amidst nature? ▪ Preference for a view of landscape from locations of living working? ▪ Have the greens increased or reduced since you know the place? ▪ What needs to be conserved/ improved in the natural environment? **Quality of Relationship of man and society** ▪ How long have you/ your family been living in the settlement? ▪ Where did your family originally come from? ▪ Do/ did you have other family, friends living in the settlement? ▪ What is/ was the level of socialization in your settlement? ▪ What activities do you share with neighbors/ community/ within neighborhood? ▪ What is/ was your role in the community? ▪ What is/ was the role of the community in times of problems/ crisis etc.? Is there leadership or NGOs, CBOs, who you/ people can turn to for support? ▪ What are the main social issues of the community? **Quality of Relationship of man with built environment** ▪ How well is the place connected to the surroundings/ different neighborhoods? ▪ Do visitors easily find way to the area? ▪ Does someone visiting for the first time have difficulty finding the way? ▪ Did you find difficulties in finding the market or your way back home from someone's place in your neighborhood for the first time? ▪ What is/ was better in here as compared to from where you come from? ▪ What is better over there? ▪ What has improved here (Urban spaces, street systems, etc.) over the years?

	- What has deteriorated? - Where are/ were you more comfortable/ at home? Reason? Or which place you consider to be home to you? Why? - Do you own property here? - Which locations are/ were best here to live and why? Or which locations have best accessibility to most areas one would need? - What should/ does one seek when deciding on location? Near to what?

Annex- 5-Interview guide for planners

Respondent: _____
Position: _____
Department: _____
Educational background: _____
Tenure of present job: _____
Total work experience: _____
Date: _____

1. **Mapping the change in the physical patterns in Islamabad**
   1.1. What is/ how do you see the present situation of the built fabric/ environment in Islamabad in general?
   1.2. Has the present situation of organization of urban spaces, street systems and housing units/ different land uses in the sector G-6 resulted in outcomes as per Doxiadis' foresight for the area and satisfying human needs?
   1.3. How do you see the changes in the physical pattern of Islamabad which shows deviation from the original 1960 plan in terms of their effects (negative or positive)?
   1.4. What are the factors responsible for the change in the physical patterns in G-6?
   1.5. What are the social, political, economic, cultural, regional or global events and processes that you think are responsible for the change in the patterns of development or have influenced the formation and transformation of the planned and unplanned settlements of Islamabad in time?
   1.6. What is/are the period(s) of change in physical pattern? Are there any significant eras that contributed to the change in patterns?

2. **Doxiadis and Islamabad**
   2.1. What do you think about the Doxiadis plan for the city of Islamabad?
   2.2. What do you think are the most important considerations of his plan that can help to maintain the original context of Dynapolis- the city of the future- Islamabad?
   2.3. Can the city of Islamabad still grow linearly and as a unidirectional city as planned? Can the Dynapolis study still be used to predict the further futures of the city of Islamabad?
   2.4. What do you think about the five principles of Ekistics? Is the synthesis of maximum contacts, minimum effort for achieving the contacts, maximum protective space, and relationship with environment the thing to focus on in human settlements in context of Islamabad?
   2.5. Are these principles or needs satisfied in the planned settlements of Islamabad?
   2.6. Do you think these principles form the basis of the unplanned settlements too or let's say settlements other than zone 1?
   2.7. Where do you think are the gaps/ problems in the case of Islamabad? What can be done about it?
   2.8. Do you think the grid of the city design can further be maintained at present situation? Do you think it should be maintained? How important is it to maintain the grid and control the patterns for the city of Islamabad?
   2.9. The zoning regulations have been revised for zone IV bringing in a lot of functions not in accordance with the Doxiadis plan? With the changes that have not been reviewed by Doxiadis associates what patterns do you foresee will follow?

3. **Human settlements and their success**

3.1. What do you think is a successful human settlement? What elements describe the success in context of Islamabad?

3.2. According to Doxiadis success is when the needs pertaining to the settlements are fulfilled and humans are happy and satisfied? How can the success of planned and unplanned human settlements in Islamabad be measured when one is compromising on one thing in one settlement and on the other in the other settlement? What will then promote happiness and satisfaction?

3.3. What are the key features or ingredients of a human settlement in order of importance?

3.4. Since the city of Islamabad was formed on the principles of ekistics, should and can the scope of ekistics be extended and the development still be guided by these principles? Reference to rethinking Doxiadis' ekistics 2010?

3.5. Do you think that adjustments need to be made to the philosophy Doxiadis? If yes what adjustments do you think are in line with the patterns of development Islamabad has seen in fifty three years?

3.6. Are we closer to the ideal city of Doxiadis- the Dynapolis- from the city of past to the city of future? Is there a continuum?

3.7. Do you wish to add anything to the interview that you believe is important and missing in the study?

Annex- 6: Photographs of research area

Early development phase of Islamabad 1960

Source: CDA Archives

Photograph 1: Islamabad 1960s

Photograph 2: Mosques in G-6 1960s

a) Masjid-e- Ahl-e-Hadith G-6/1, b) Masjid-e-Bilal G-6/3, c) Lal Masjid G-6/4 1960s

Photograph 3: Facilities development in G-6 1960s

a) G-6 (1960) Melody Cinema, b) Government Girls' School G -6/4, c) G.T.S. Aabpara

Photograph 4: Higher-order facilities development 1960s

I & T centre/ Aabpara market G-6, b) Islamabad hotel c) Police station Melody G-6, 1960s

PLANNED HUMAN SETTLEMENT OF G-6- (2013)

Source: Author (2013)

Existence of contacts:

Contact with nature:

Photograph 5: Nature

G-6/4 Storm water nala near Lal masjid used earlier for fishing and relief from heat by children b) Community Park c) The right of way or green belt (475 feet wide) along the Atta Turk Avenue and a storm water nala running through.

Contact with works of man:

Photograph 6: Works of man

Markaz G-6- Melody market a) Pakistan Post office b) First four star hotel of Islamabad (1960s)- Islamabad Hotel, c) First Mosque in G-6- Lal Masjid (Red Mosque) 1966

Photograph 7: Commercial activity at different levels

a & b), Main Aabpara Market I& T centre developed in sixties, c) New Aabpara market G-6-1 developed in nineties, d) Weekly *Itwaar bazaar*

Photograph 8: Weekly bazaars and markets G-6

a) Informal women sellers occupying pedestrian paths outside Lal Masjid on Sunday b) Itwaar Bazaar (Sunday market)

Photograph 9: Commercial activity in G-6

a) Small informal hotel and fruit vendors b) CDA allotted kiosk 10'x10' c) informal eateries developed at Van stop in Aabpara, d) Café G-6/1 the oldest café in Islamabad

Photograph 10: G-6- Accessibility options

Van stops at various locations Aabpara van adda, pedestrian and motor bike and Bicycle Bridge connecting G-6 and G-7 on Seventh Avenue.

Photograph 11: G-6 No through traffic streets and pedestrian paths providing inter street connection

Photograph 12: Mosques in different sub-sectors of G-6

Photograph 13: Different academic institutes (public and private) in the sector G-6

Photograph 14: Public facilities G-6

a) Polyclinic Hospital b) Capital Hospital c) Police Station

Photograph 15: Water filtration plants and overhead water tanks for the area

UNPLANNED HUMAN SETTLEMENT OF BHARA KAHU (2013)

Source: Author (2013)

Existence of contacts:

Contact with nature:

Photograph 16: Views of natural landscape dominant in Bhara Kahu

Contact with works of man:

Photograph 17: Commercial areas and markets Bhara Kahu

a) Stalls along Simly Dam road b) Wednesday bazaar c) Main commercial area along Murree road

Photograph 18: Main Murree road approach to Bhara Kahu

Photograph 19: Street systems- vehicular and pedestrian only streets

Photograph 20: Academic institutes (Public and Private) in the Bhara Kahu

Photograph 21: Public facilities institutions

Bhara Kahu-Government Rural Health centre, Rural Development centre Bhara Kahu

Annex-7- Tables of research findings

Source: Author

Table 18: G-6- Frequency of contact

S.No	Particulars	Very often	Often	Sometimes	Rarely	Never
1.	Nature reserves					
a	Lakes, Rivers etc.	5	23	14	27	9
b	Forests	0	9	18	23	14
c	Green area/ Fields	14	14	18	9	14
2.	Parks	50	9	18	5	9
3.	Places of social interaction					
a	Within the same street	18	9	9	14	9
b	Within the neighbourhood	9	9	14	14	5
c	Outside the neighbourhood but within the same sector/ locality	5	9	14	5	14
d	Outside the sector but the same series etc.	0	23	23	14	14
4.	Play grounds	32	9	14	18	9
5.	Market/ commercial areas	70	14	5	6	5
6.	Places of worship	32	5	9	5	9
7.	Academic institutes	20	14	5	9	14
8.	Healthcare	14	9	18	14	14
9.	Offices, banks etc.	18	18	6	5	6

Table 19: Bhara Kahu- Frequency of contact

S.No	Particulars	Very often	Often	Sometimes	Rarely	Never
1.	Nature reserves					
a	Lakes, Rivers etc.	17	38	17	4	17
b	Forests	17	21	17	4	17
c	Green area/ Fields	25	13	8	13	13
2.	Parks	46	25	8	8	13
3.	Places of social interaction					
a	Within the same street	8	29	21	4	4
b	Within the neighbourhood	21	13	21	4	4
c	Outside the neighbourhood but within the same sector/ locality	17	17	8	13	8
d	Outside the sector but the same series etc.	4	13	8	21	8
4.	Play grounds	29	33	4	8	25
5.	Market/ commercial areas	38	33	17	0	0
6.	Places of worship	25	25	17	13	8
7.	Academic institutes	17	21	13	17	29
8.	Healthcare	8	21	29	17	4
9.	Offices, banks etc	13	13	4	4	17

Table 20: Needs of people pertaining to settlements- G-6

S. No.	Particulars	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	Nature reserves					
	Lakes	23	18	14	5	9
	Forests	14	9	0	27	18
	Open green areas	36	18	14	5	5
2	Parks	82	9	0	0	0
3	Places of social interaction					
	Within the same street	45	23	14	5	0
	Within the neighbourhood	0	36	23	9	0
	Outside the neighbourhood but within the same sector/locality	0	36	9	5	9
	Outside the sector but the same series etc.	0	18	9	9	9
4	Play Grounds	45	27	18	0	0
5	Community centre	14	27	9	0	0
6	Markets/ commercial areas	50	23	14	5	0
7	Places of worship	36	18	9	9	0
8	Academic institutes	36	27	5	9	0
9	Library	68	18	14	0	0
10	Healthcare	36	27	23	0	0
11	Work place	32	14	5	9	5

Table 21: Needs of people pertaining to settlements- Bhara Kahu

| S. No.	Particulars	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	Nature reserves					
	Lakes	42	25	0	4	4
	Forests	38	13	25	4	4
	Open green areas	38	21	4	0	8
2	Parks	58	25	4	4	8
3	Places of social interaction					
	Within the same street	4	8	8	4	0
	Within the neighbourhood	4	17	0	8	8
	Outside the neighbourhood but within the same sector/locality	13	13	21	4	4
	Outside the sector but the same series etc.	4	13	21	4	4
4	Play Grounds	42	33	8	4.2	4
5	Community centre	17	21	25	8	0
6	Markets/ commercial areas	33	17	8	4	8
7	Places of worship	42	4	17	25	0
8	Academic institutes	25	21	8	0	4
9	Library	0	21	17	0	0
10	Healthcare	38	25	8	0	17
11	Work place	13	4	8	8	17

Annex-8 Maps and Drawings
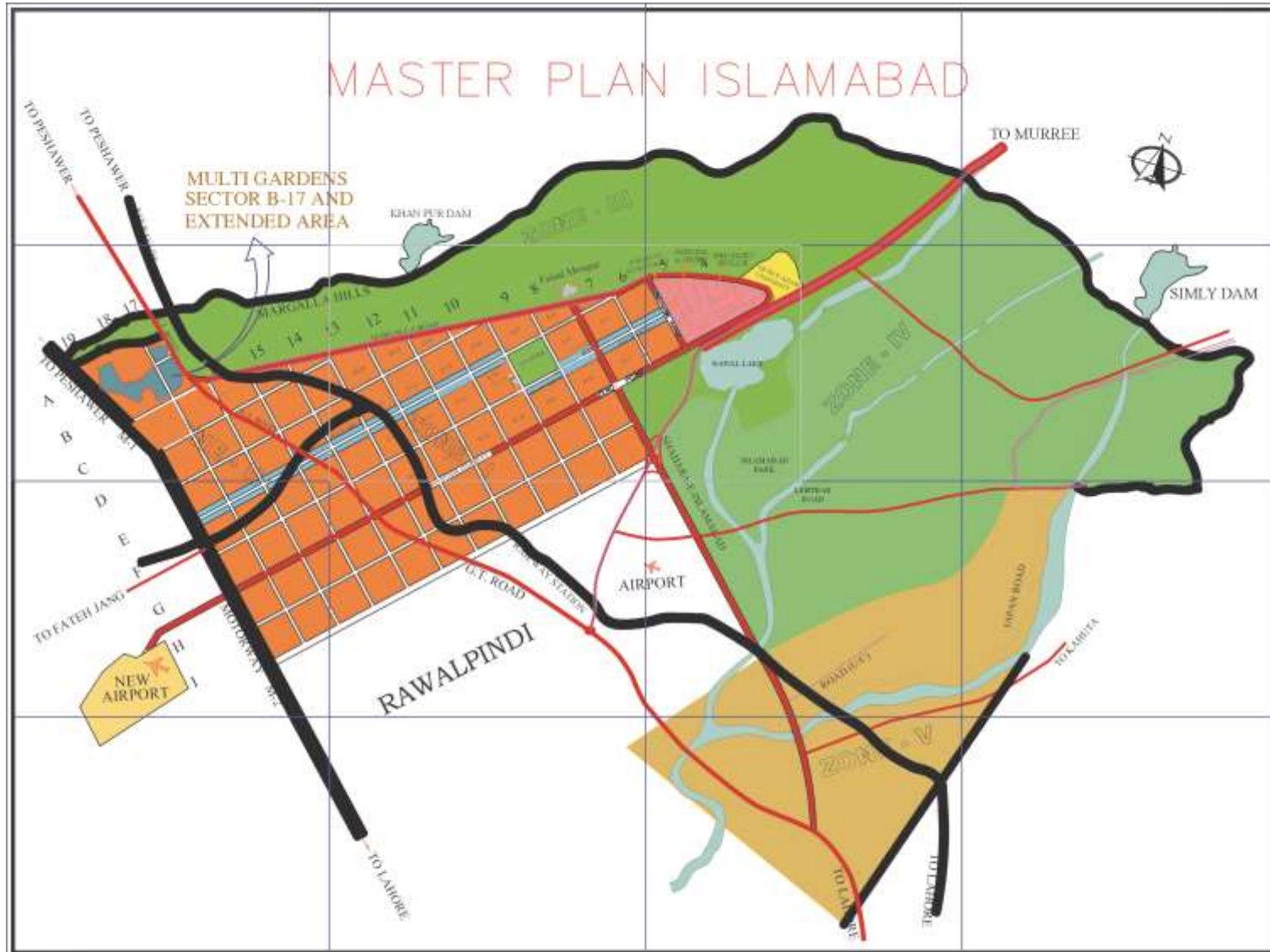
Figure 30: Master Plan Islamabad

Figure 31: Master Plan Islamabad with zones
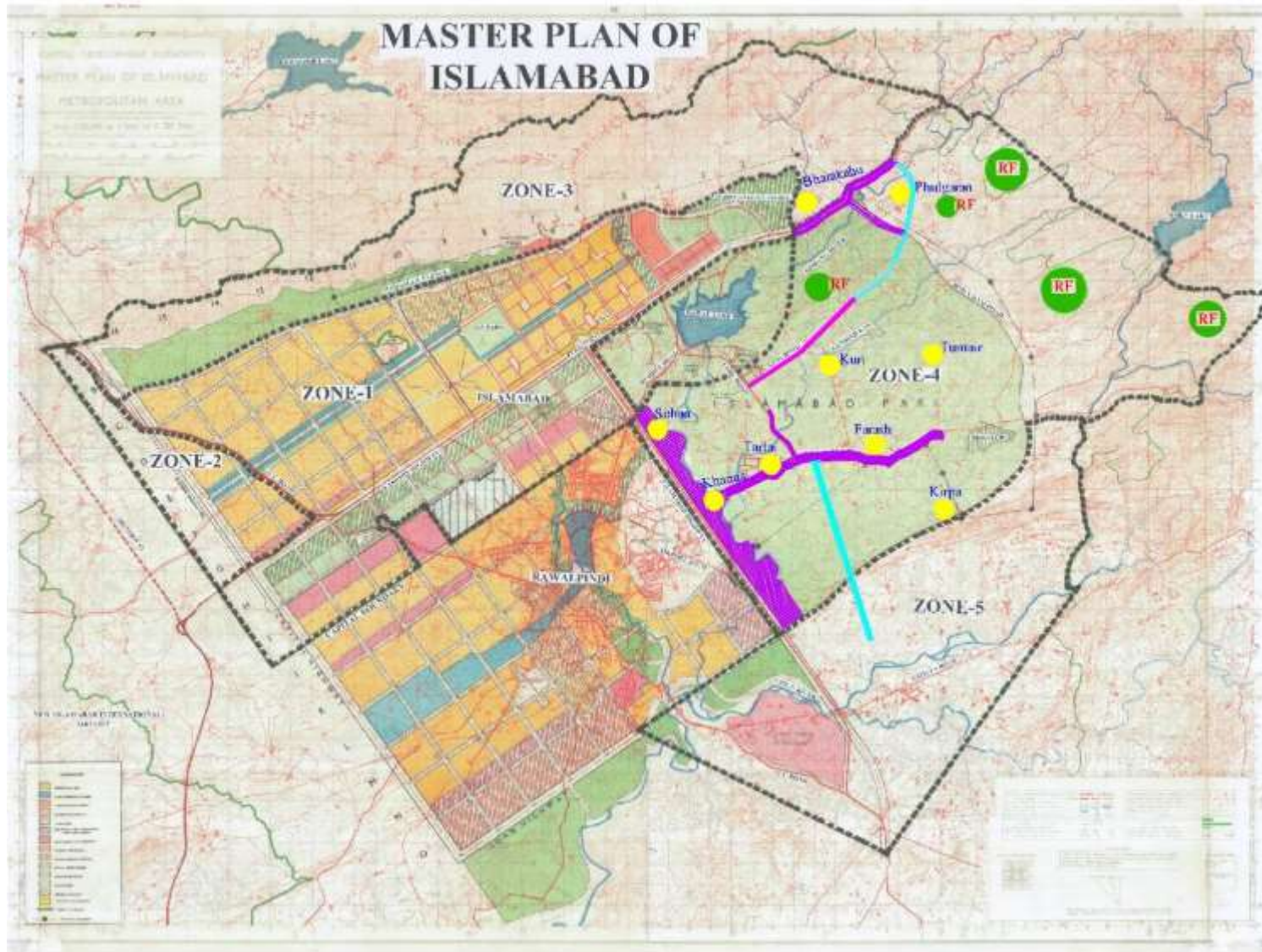
Figure 32: Master Plan for Islamabad Metropolitan Area 1960
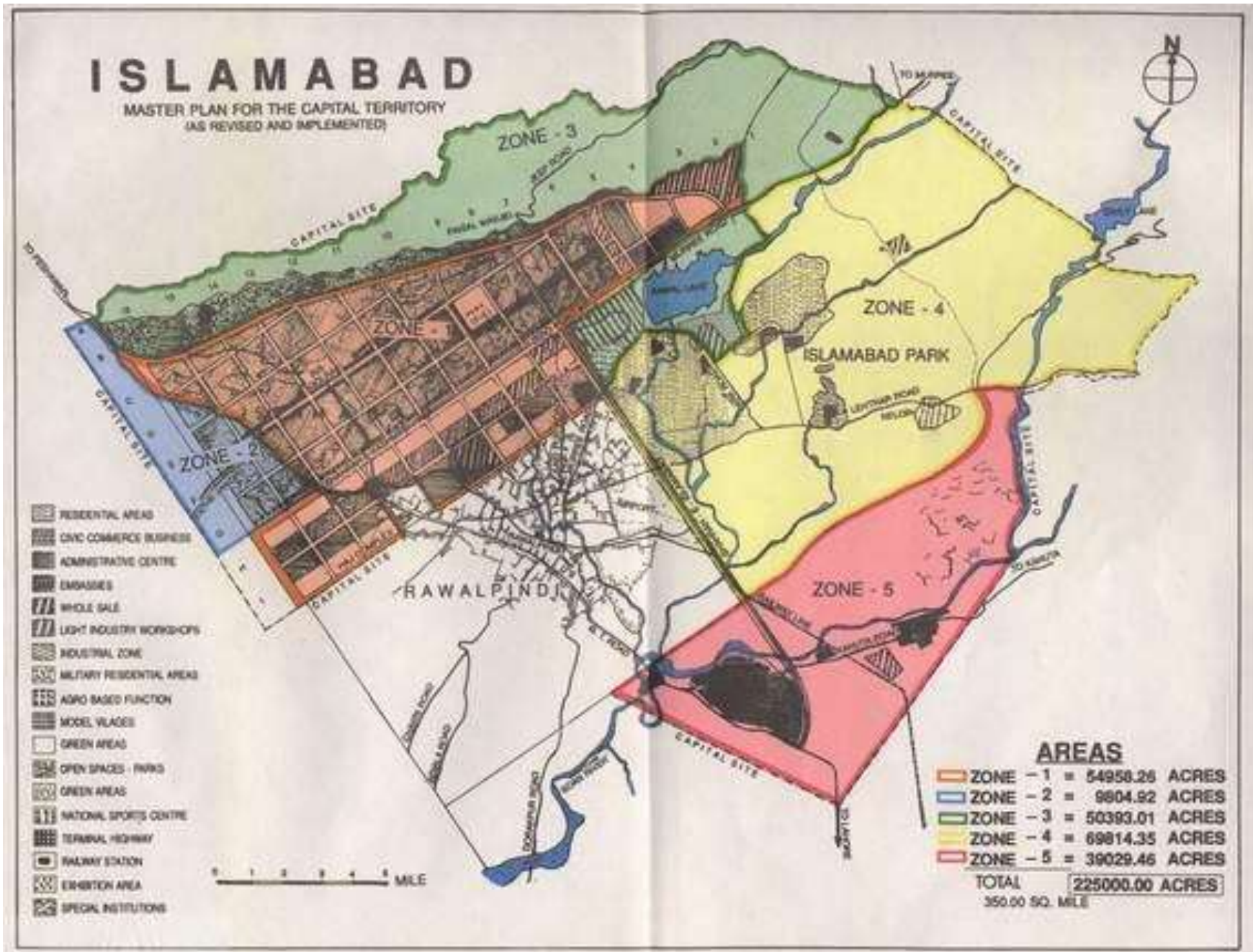
Figure 33: Master Plan for Islamabad Capital Territory as revised and implemented