Urban infrastructure finance and its relationship with land market, land development, and sustainability:

Case study of the City of Islamabad, Pakistan

by

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Author's declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners. I understand that my thesis may be made electronically available to the public.

Abstract

Cities are responsible for 70% of global carbon emissions. As a result, cities worldwide have been met with the challenge of urban sustainability. Urbanization results mostly from the conversion of agricultural land into urban form; and to perform various functions, urban systems need to be put into place and maintained to keep them moving forward. Urban development, with its ability to deliver socioeconomic benefits, is a key to economic success, human development, eradication of poverty, and overall sustainable growth. The core infrastructure of a city, which includes roads, mass transit, airports, electricity production and distribution, and water/sewer systems, hold the utmost descriptive power for efficiency and joint necessity in fostering economic growth and in reducing poverty and income inequalities. Extensive public and private led infrastructure projects are critical for ensuring efficient economic function.

Urban sustainability assessment indicators are based on economic, social and environment aspects which are integrated within rules, regulations, and polices. Urban design integrated in the natural environment plays a key role in shaping a city's future. Compact design, density, walkability, quality of life, amenities, and economic development are several of the fundamental principles of urban sustainable development.

Developing countries like Pakistan are facing very specific issues with respect to urban development due to lack of financial and performance capabilities. Although cities are growing and expanding in all respects, they are becoming more and more difficult to maintain. Despite the expansion of urban boundaries, issues, such as shortage of housing, quality of life, and financial constraints to adequately manage communities, are also increasing. In other words, urban boundaries are being pushed but are failing to be managed sustainably.

Accordingly, the present study's objective is to identify the forces and motivations that are driving land development in the city of Islamabad, Pakistan. Two questions are raised: 1) Is land development influenced by the element of financialization? And, 2) How do land development decisions influence urban sustainability in Islamabad? This paper's objective is to first confirm whether the element of financialization does in fact influence urban land development, and then to explore its relationship with urban sustainability.

This study uses assessment of urban land development patterns, market motivations and their relationship with utility of land development, and analyzes occupancy trend and sustainability in terms of Islamabad's provision of basic amenities and walkability. The study is based on a mixed method design, using both quantitative and qualitative data from secondary and primary sources. Data was analyzed statistically through hypotheses testing and validation.

Research confirms that the financialization of local land development practices and issues of urban sustainability with respect to walkability and slower rate of occupancy of developed land. This study provides a unique aspect into the financialization in a local context of land market motivation and land development patterns. It also emphasises the need to incorporate market motivations and the necessity for land development into the future land development decision-making process and to formulate sustainable urban growth strategies.

Keywords: *sustainable infrastructure, infrastructure finance, sustainability assessment, sustainability indicators, urban sustainability, urban sprawl, sustainable development, urban financialization.*

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CDA – Capital Development Authority Islamabad

CDA-BCR- Capital Development Authority Building Control Regulation

FCM – Federation of Canadian Municipalities

HRCP – Human Rights Commission of Pakistan

IHC – International Housing Coalition

MCC – Ministry of Climate Change Pakistan

PC – Planning Commission of Pakistan

WPS – The World Population Situation

WPU – World Urbanization Prospects

WEC – World Economic Council

Section 1 - Introduction

1.1 Background

Population expansion and human activities determine the carbon footprint and accelerate the strain on natural resources, energy, and overall environmental health of the planet. Cities are accountable for almost 70% of global carbon emissions; emissions that continue to increase due to a growing urbanization trend (UN-Habitat, 2011; WRI, 2014; Loof & Nabavi, 2013; Yoko, 2013; UNITAR, 2016; WB, 2013; Moriarty & Honnery, 2015; UNEP, 2016).In addition, 75% of the world's energy consumption by its urban population is representative of only 2% of the world's surface (UN-Habitat, 2011).

The world population was 7.2 billion in 2014; and according to a UN projection, it will likely reach 10 billion by 2050 (UN, 2014). The global urban population reached 54% in 2014 compared to 30% in 1950; and it is expected to reach 66% by 2050 (UN-WUP, 2014). Compared to the most urbanized regions of the world (e.g., North and Latin America, the Caribbean and Europe with 73% to 82% urban populations, respectively), there has been a 90% increase in urbanization concentrated in Africa and Asia. Africa with 48%, and Asia with 40% of their respective population living in urban areas, are urbanizing faster than are other regions and are projected to reach 56 and 64 percent respectively by 2050 (UN-WUP, 2014).

Cities are of a very complex nature due to their social, economic, environmental, governance, and development patterns (McGregor, Simon, & Thompson, 2006; Tacoli, 2006; Puppim de Oliveira, et al., 2012). The urban geographic footprint represents population concentration and density. Although higher density makes it easier to design urban form for better distribution of resources and energy savings (Wackernagel, Kitzes, Moran, Goldfinger, & Thomas, 2006), concentration of population, either planned or unplanned, without taking into consideration the operation, services and amenities provision and cost to perform all fundamental urban functions, renders this distribution ineffective for both livelihood and environmental protection (Coutts, Beringer, & Tapper, 2007; URBACT, 2014; UN-Habitat, 2008; Puppim de Oliveira, et al., 2012).

The universal consensus on the key features of sprawl or urban expansion are: endless cities, ill-defined urban and rural boundaries, a polycentric urban structure, scattered development, ribbons and commercial strips, and the fragmentation of open space (Angel, Parent, & Civco, 2012). Cities contain open spaces typically equal to built-up areas and are more fragmented with higher income levels, whereas less fragmented if they have adopted restrictions on expansion (Angel, Parent, & Civco, 2012). Over a period of 20 years, from 1970 to 1990, the United States' urban sprawl spread out over an additional 14,545 square miles by consuming an additional nine million acres of farmland and rural space (NumberUSA, 2008). Similarly, European cities are expanding faster than the population growth rate and with a tendency towards density reduction since 1970 (Oueslati, Alvanides, & Garrod, 2015).

This urban sprawl trend, with its inefficient development of cities' green spaces, in relation to population growth, (Bruchell, Shad, Listokin, & Phillips, 1998) has garnered increased criticism due to the trend's negative economic, social and environmental effects. The costs and negative externalities of urban sprawl have been widely acknowledged (Brueckner , 2000; Freeman , 2001; Kahn, 2000; Oxley, 2004). Greenfield development, often encouraged by profit-seeking developers in an emerging economy, and considered by them as beneficial to society, resulted in low-density housing (Breheny, 1997; Sousa, 2000). Such low-density expansions emerged primarily due to individuals' desire for higher returns; and lowland rural land values encouraged the conversion of agricultural land into urban form. Under such conditions, resource allocations become a challenge (Oxley, 2004; Bramley, Bartlett, & Lambert, 1995), in addition to the fact that preferences for single-family suburban living also promote urban sprawl (Breheny, 1997; Gordon & Richardson, 1997).

Generally, there are three types of market failure which lead to expansion of cities: social value of green land, social cost of congestion, and failure to recover new development additional costs from developers (Brueckner J. , 2000). City governments around the world are adopting policies to contain urban sprawl by promoting more sustainable forms of urban development. The conservative approach towards urban expansion by implementing strict boundary regulations, density restrictions, and added cost of infrastructure on new developments particularly in peripheral areas, has had a positive impact on controlling sprawl (Terzi & Bo¨len, 2012).

The rise of the financial sector and financial markets, in the recent past, changes the meaning of financialization particularly in the urban context (Pike & Pollard, 2010; French, Leyshon, & Wainwright, 2011). Finance-centric and corporate-centric (Krippner G. R., 2011) political economy (Pani & Holman, 2014), with a focus on commodities and shareholder values, are the common approaches of financialization (Froud, Johal, Leaver, & Williams, 2006). In addition to, financial dealings in everyday life has become a part of the cultural economy (Langley, 2014; Lai & Tan, 2015). Cultural economy, dealing with urban financialization, is geographical concentration of finance in territorial boundaries of the major cities rather than simply financial accumulation (Wójcik, 2009).

Financialization of everyday life activities, including debt and mortgages, has resulted in financial speculation (Jordà, Schularick, & Taylor, 2014), an increase in inequalities, and a higher cost of living (Kumhof, Romain, & Pablo, 2015). The impact of financialization on the urban landscape and urban sustainability have been scarcely focused on in the past, particularly within the context of urban geography (Clark, 2006; Theurillat & Crevoisier, 2014).

In general, urban growth generates benefits for the entire region, but the cost of this growth is usually carried by the neighborhoods in the new developments. Impact fees, taxes, and the increasing cost of land are the major factors that drive the individual choice of selecting decentralized neighborhoods over public goods. In the fully-modeled land market, changes in housing value for existing residents will impact on density and size of the city. Impact fees, which are infrastructure fees on new developments, are not high enough to offset additional costs to existing residents. Therefore, additional subsidies and decreasing taxes on existing residents will induce existing residents to allow in new residents, and will ultimately result in density increase and an overall benefit to the entire city (Cinyabuguma & McConnell, 2012).

Sustainable development requires the integration of resource consumption patterns, investment, technology, and institutional change to develop both present and future potential to meet people's needs (WCED, 1987). A city's growth and development pattern has a major impact on environment and socioeconomic aspects on both local and regional levels. Therefore, cities are a starting point for development of sustainable policies (Camagni, Capello, & Nijkamp,

1998; Clarke, 2014). Urbanization and population density are considered as key factors that shape the future of cities (Suzuki, Dastur, Moffatt, Yabuki, & Maruyama, 2010). To mitigate climate change impact and to create a balance among various dimensions of sustainability, effective solutions for new and existing urban areas are critical (Siemens, 2012; Sharifi & Murayama, 2015).

1.2 Study area

1.2.1 City background

Pakistan is one of the most urbanized nations in South Asia. Its urban population between 1990 and 2014 increased from 33 million to 80 million and is expected to increase at the rate of 3.5% by 2025 compared to the current overall population growth rate of 1.6% (MCC, 2015; UN-WUP, 2014).

Islamabad, the capital city of Pakistan, was established in the 1960s, and is located in the northwest part of the country in the proximity of the city of Rawalpindi. Islamabad's estimated population in 2014 was 1.297 million (UN-WPS, 2014) spread over an area of 906 km^2 (CDA, Islamabad history, 2016). After the establishment of Pakistan in 1947, Islamabad was the only city in the country established on the basis of well-planned urban design (Maria & Imran, 2006).

Islamabad, being the only planned city in the country, is selected as a case study due to its unique context within the country. The strategic importance and convenient location of Islamabad has made it a preferred location in which to live and invest.

Islamabad is subdivided into five zones and each zone is further subdivided into sectors and independent residential developments usually called housing schemes. Zone 1 is the most densely populated zone, with 82% of residential units covering 25% of the total city land area (Colliers, 2009). At present, 58 legal and 31 illegal privately-led residential subdivisions are under development. Out of the legal 58 developments, 31 are only in Zone 5, comprising 58% of the total zoned land (CDA, Islamabad history, 2016). Zone 5 covers 17% of the total city land area, contributing only 5% of housing units. As per Colliers 2009 report, 69% of residential units in Zone 5 were either vacant or under development (Colliers, 2009).

Islamabad is managed by the Capital development Authority (CDA) which is responsible for all municipal and development functions. CDA, operating under a very narrow scope of services, is unable to provide quality fundamental services to the public (Adeel, 2010; Malik & Wahid, 2014; MCC, 2015). There is no provision of public amenities in CDA's scope of work; therefore, a major part of the city is completely neglected, specifically private residential developments. CDA's municipality functions mainly include physical construction (roads, bridges, etc.) and basic services such as water supply, waste collection, sewage, street cleaning, and maintenance of parks and public buildings (MCC, 2015; CDA-Housing, 2016). Services expenditures account for 38%; and only 65% of services costs are recovered through all sources including taxes and government maintenance grants. Major physical construction expenditures, which is 62% of the total annual budget (CDA, Budget, 2014), are primarily financed through bulk land sale. Whereas, if you look at Canadian municipalities, their average revenue collection through public sources (taxes, fines, charges) accumulated up to 72% (FCM, 2012) of the total development and non-development budget; in Toronto, budget revenue through public sources was 78.5% in 2015 (Toronto, 2015). In contrast to CDA, Canadian municipalities are also responsible for public safety, housing, health care, transportation, recreation, and other public services in addition to basic operational maintenance services.

There are several things that affect physical structure, quality of life, and sustainable growth. Instead of comprehensive urban planning, development in the city of Islamabad is restrained to only ad-hoc based projects that receive capital funding (MCC, 2015). Lack of financial capacity, integrated planning, technical and research expertise are the major challenges that hinder sustainable growth (MCC, 2015).

The country's housing finance is limited to 2% through formal institutions, which is 0.45% compared to the general practice of 5% of GDP (HRCP, 2015). Land market manipulation and non-availability of funds, for the construction of houses, are keeping developed land vacant for decades and forcing lower income families to move toward informal housing (MCC, 2015).

Urban sprawl and land use changes in Islamabad between 1972 and 2009 was assessed by Butt et al. (2012) using multi-sensor and satellite imagery. It was found that urban boundaries were

added to by 87.31 km2 while developed land increased by 53% from 165 km2 to 252.31 km2 in the same period. 49% of the urban land constitutes spars residential developments (Butt, Waqas, Iqbal, Muhammad, & Lodhi, 2012). In addition, existing villages are continuously spreading onto agricultural land, without the necessary amenities and infrastructure in place (Adeel, 2010). A similar trend of converting grade-one agricultural land to an impervious surface is quite common around the country (Niazi & Khetran, 2007, Butt, Waqas, Iqbal, Muhammad, & Lodhi, 2012; MCC, 2015).

1.2.2 Development practices - Bylaws

Residential communities developed by both city government and private companies were based on CDA bylaws of residential communities (Societies). According to CDA Zoning regulations of 2005, private land development for housing was encouraged. The site and service model was adopted for the development of residential communities. In this model, private companies with a minimum land area of 100 acres could develop the land for residential purposes by providing basic infrastructure, including roads, electricity, and water and sewerage facilities. Developers, upon completion of land development, could hand over possession of plots to individuals (CDA-ZR, 2016). Individual plot owners could then be responsible for constructing their own houses. The land use authorized by CDA for any private land subdivisions is divided into six categories, allocating 55% maximum land use for residential houses, 5% for commercial areas, 4% for amenities, and the remainder for roads and open spaces. The maximum buildup allowed for a residential area is 50% to 60% of plot with FAR 0.85 to 1.2 with 30 feet maximum height permitted (CDA-BCR, 2016). All residential communities developed in the city used 45% to 55% of developed land for low density single-family housing (CDA-ZR, 2016).

1.2.3 Development trend & practices

As per current practices, the city development authority (CDA) permits the private sector to develop residential housing on a large scale, primarily for the two following fundamental reasons:

1) To meet the growing need of housing (as stated in many government documents).

2) To generate funds to run city affairs (as major sources of capital finance; Islamabad city development authority (CDA) is through government funding or selling of land).

The private sector is responsible for developing, selling, and maintaining the development. Their major sources of financing are as follows:

- Selling of land on installment before actual development starts (Capital finance generated through market).
- Major source of revenue after development is fee-charged on transfer of properties (land or house).
- Resale of plots to capitalise value gain;

  No other major source of earning can be developed to cover operational cost.

1.3 Problem statement

Developing countries are facing very specific issues with respect to urban development due to lack of financial and performance capabilities. Although cities are growing and expanding in all respects, they are becoming more and more difficult to maintain. Public and private urban development investments are drivers of economic growth and reduction in poverty. For steady economic growth, the private production of well-functioning urban land and housing projects, (Dowall & Ellis, 2007) and the performance of urban assets play a critical role (ICLEI, 2011).

Pakistan is facing the challenges of the growing trend of urbanization and inadequate formal housing (Malik & Wahid, 2014; Niazi & Khetran, 2007; HRCP, 2015). Poor urban planning, lack of capacity, and ineffective land use (Maria & Imran, 2006) have increased the inefficiency of public investments and policies to deliver public benefits. Due to the potential for high returns, the Pakistan real estate sector is holding investments in various forms of almost one third of an individual's worth (Aslam, 2014). Despite the importance of real estate development and the investment it holds, Pakistan's housing market is not functioning efficiently (Dowall & Ellis, 2007). Pakistani cities are expanding under the suburban model with low-density, automobile-dependent residential developments, whereas what it needs is medium-high density, energy-conserving, and low-demand travel communities (Haider, et al., 2014). Current practices of urban land development, particularly for residential use, is common in all cities of the country.

Although, the conversion of agricultural land to an urban form is constantly occurring, this does not solve the problem of shortage of housing. Increasing land prices and the inability to finance

housing construction is encouraging informal housing and the formation of slums (Adeel, 2010). These informal settlements are creating additional problems due to poor infrastructure and lack of amenities.

Islamabad is facing a number of urban issues, including the (in)ability to finance capital development, municipality operational costs, provision of urban services, quality of life, and economic development (Adeel, 2010; Haider, et al., 2014). In the past few decades, the development of an economic base has been completely neglected. The population increase and the expansion of city boundaries have contributed to increased commuting costs, poor facilities, pollution, and increased health risks to residents (Adeel, 2010; Haider, et al., 2014). In rural residential developments, in the city limits of Islamabad, only 13% of the population has road access, with only 4.5% of the population having access to a piped water supply and sewage system (Adeel, 2010). Not only rural but urban private developments too are lacking basic facilities; several studies have identified these issues related to water supply, drainage, waste disposal, cleaning and management (Saleem, Sharif, & Khursheed, 2015). Provision of amenities such as public transport, schools, and hospitals are difficult to find in proximity due to a very slow growth in occupancy rate in private developments.

A growing number of social issues are also emerging because of these haphazard residential developments. Urban land has become a commodity, attracting huge investments for easy and growing profit. This is creating an uneven distribution of wealth, disparities among the low- and middle-income population, lack of access to land and housing to a majority, while creating a negative impact on efforts to meet housing requirements (Rehman, 2014; HRCP, 2015; MCC, 2015; PC, 2007). Affordability of homes is another issue as the lack of a housing financing mechanism is also fueling this problem (HRCP, 2015; MCC, 2015).

1.4 Significance of the problem and study contributing to finding a solution

The above-mentioned case study provides clear evidence of the sustainable development issue not only for present generations, but also for future generations toward their ability to meet the needs, provision of expansions, and ability to improve living conditions.

Because there is a lack of evaluative evidence of long-term urban development performance in general, and a lack of public/private coordinated impact assessment data in particular, the main rationale for this study emerges. It is important to study the unique local set of conditions and requirements to develop a strategic decision-making framework for sustainable urban development particularly for developing countries. The type and effects of decision-making, and the implementation process with respect to urban coordinated land use and transport system when considering urban form and development shape, require further research and knowledge development (Nilsson, et al., 2014).

Urban sprawl is a key aspect to determining quality of urban expansion. As per the theoretical evidence, whereas previous examinations of this issue were carried out in a single dimensional way, urban sprawl is a multidimensional issue and needs to be measured in a certain way (Oueslati, Alvanides, & Garrod, 2015). Dimensions are based on urban spatial scale, population density decline, and fragmentation (Chin, 2002). Factors driving urban sprawl are usually based on consumer preferences, regulations, population increase, and changes in mode of transportation (Oueslati, Alvanides, & Garrod, 2015). Land speculation was discussed in the literature of the 1960s and 1970s with mixed opinions on whether land speculation is part of an efficient land market and one of the causes of scattered development (Chin, 2002). However, in general, the impact of land market has not been discussed widely in recent literature with respect to urban sustainability.

In the literature, cost impact of urban expansion is focused on capital, operating, and transportation cost, with little emphasis on quality of life and social issues (Dodds & Dubrovinsky, 2015; TRB, 1998). One of the benefits of urban sprawl determined through empirical studies is the availability of affordable housing to low income groups (Aurand, 2013), but these studies fail to address the issue of informal settlements and the establishment of slums.

Analysis of urban expansion over time and space, when considering two factors of urban sprawl, was used to measure the spatial scale of the city and the level of fragmentation (Oueslati, Alvanides, & Garrod, 2015). In addition to that, various other determinants were independently used to measure urban sprawl and its impacts. On the one hand, urban assessment with

environmental performance is measured usually with respect to environmental, life-cycle, and sustainability assessment in mind (Adinyira, Seifah, & Kumi, 2007). One the other hand, sustainability assessment methodologies are usually based on environmental, social, economic, and governance aspects (SEP, 2015).

Financialization impact on the urban landscape has not been studied extensively within urban geography (Clark, 2006). The sustainability development aspect has received even less attention, particularly the transformation of city landscape due to the interaction of financialization and sustainable development at the same time (Theurillat & Crevoisier, 2014).

In this way, the evaluation of urban development by integrating urban form, determinants of sprawl, municipality functions, sustainability, and those factors driving urban expansion, including market and public motivations, will provide a unique perspective via a real-life case study.

The present study not only provides insight into specific development issues, but also into the systematic review and integration of various aspects of determination of structure, evaluations, and sustainability. It further provides insight into (with respect to socioeconomic impacts on communities and particularly on land financialization) housing need, land utilization, and occupancy and its impact on community sustainability. This work also details a case analysis to facilitate local authorities in formulating sustainable future policies with respect to land development, housing need, and occupancy growth. In addition, it provides a different angle of analysis to integrating the development pattern, governance, and market forces within public motivation and requirements towards land development.

1.5 Research question and objectives

The objective of this study is to determine what the sustainability of urban development practices in Islamabad are, and to identify the forces and motivations driving land development there. To determine the relationship between land development practices and urban sustainability, the relationship between the elements of financialization in urban development practices, market forces, and their impact on urban sustainability were explored

The research's broader topic is based on its study of "Financing urban infrastructure through financialization and its relationship with land market, land development, and sustainability by using a case study of the City of Islamabad, Pakistan". Three major indicators -- financialization, land development, and sustainability -- were studied using three major factors: real estate market and public motivation, occupancy growth rate, and walkability.

Specific research question and sub-questions are as follows:

Q: How does the financialization of urban development influence occupancy growth and urban sustainability in Islamabad, Pakistan?

1. Current land development practices; is this a financialization of urban land?

2. Are urban land development practices sustainable in the city of Islamabad, Pakistan?

Urban land development under the influence of financialization affects the occupancy rate and, ultimately, community sustainability. The slower occupancy rate and low-density population make it unfavorable for early supply of basic amenities such as schools, shopping, and work opportunities within proximity. As a result, communities become more unsustainable due to dependency on vehicles in their daily activities. In addition, developed land that is not being used for housing purposes also increases stress on the environment in multiple ways, including decrease in agricultural land, increase in impervious surface, heat island effect, and water runoff. The social consequences of land financialization in terms of market manipulation increase the differences in income distribution and issues of housing affordability.

1.6 Structure of thesis

The thesis consists of five chapters. The first chapter provides a brief introduction to the study, its objectives, and its rationale. The second chapter contains a comprehensive literature review on sustainability in general; and in an urban context, urban development and financialization. This section also concludes the theoretical model of this study. The third chapter describes the methodology adopted for this study and provides data collection of secondary sources, survey creation, and dissemination and analysis methods. The fourth chapter presents the results and statistical analysis to validate the theoretical model. The fifth chapter discusses the results,

connecting the literature, and concluding with the outcomes along with suggestions for future research.

Section 2 - Literature review

2.1 Introduction

This section covers both empirical as well as gray literature on sustainability, particularly in the urban development context. The literature review begins with a general concept of sustainability, and its application in sustainable urban development. Later in this section, the concept of financialization and its role in urban development is discussed. The last part of this section discusses sustainability assessment methods, and indicators are reviewed in the local context along with various methods of quantification.

2.1.1 Sustainability

The Brundtland report was first published in 1987 as a result of the World Commission on Environment and Development (WCED) that took place in 1984 to formulate a global agenda for change. The Brundtland report investigated Earth's carrying capacity and its impact on the environment. The Brundtland commission then came up with the precise definition of sustainable development as "*development which meets the needs of the present without compromising the ability of future generations to meet their own needs"* (WCED, 1987: 43). The report emphasizes the form of development which can meet the needs of present generations by keeping a balance of opportunities and abilities between present and future generations. Sustainable growth within ecological and technological limits can be achieved by creating goals based on equity and quality, which require compassion and wisdom, instead of being based on quantity and output (Meadows, Meadows, & Randers, 1992). The Brundtland Commission was very clear about the risk of losing intergenerational equity on resource consumption and strove to create a balance between economic, social, and ecological objectives. Being a continuous process of change, sustainable development requires the integration of resources and consumption patterns, investment, technology, and institutional change to enhance both current and future generations' potential to fulfill their needs (WCED, 1987). There is equal emphasis on growth as well as on development of quality of life through the protection of natural resources and social equity. However, it is very important to maintain the distinction between quantitative growth and quality development (Daly, 1991). Sustainable societies with a strong sustainability

approach combine natural and manmade conditions for development objectives (Daly, 1991). Sufficiency and efficiency remain keywords for sustainable development strategies as defined by the Brundtland Commission.

2.1.2 Sustainable Development

As discussed earlier, development and sustainable growth depend on the integration of resource production and consumption patterns. Sustainable development involves a complex interrelationship between its basic components: social, economic, and environmental development, and its associated dimensions of wellbeing (Ciegis, Ramanauskiene, & Martinkus, 2009). Thus, sustainable development is creating a compatibility with environmental protection and socioeconomic progress rather than prioritizing one over the other. The conventional mechanism of economic growth emphasizes only on continuous and unlimited growth in which equity is either ignored or kept on low priority. Every subject has a different take on sustainability (Ciegis, Ramanauskiene, & Martinkus, 2009). In Economics, development means per capita income increase and incorporating sustainability as the balance of income between present and future generations. In Sociology, the focus is on preserving communities, their relationships and culture. Ecology looks to ecosystems and the capability of ecosystem services to meet the needs of the Earth (Bovarnick, Alpizar, & Schnell, 2010).

Within this debate, weak and strong concepts of sustainability have emerged. In opposition toward strong sustainability, a weak concept of sustainability allows for the consumption of natural resources. Weak sustainability is based on the theory that both manufactured capital and natural capital stand equal in terms of generating well-being (Ekins, Simon, Deutsch, Folke, & De Groot, 2003; Neumayer, 2003). In this collective stock of capital that matters, should be increased or maintained for the sake of generations to come (Solow, 1993). Strong sustainability, on the other hand, objects to the notion of natural and manufactured capital equality given the qualitative difference that exists between them. Natural capital, with a unique set of complex systems, provides ecosystem capacity and service to human society (Ekins, Simon, Deutsch, Folke, & De Groot, 2003). Most natural capital sources are irreversible compared to manufactured capital because manufactured capital requires natural capital for its production, and thus it cannot be substituted for the biophysical structure of natural capital (Ekins, Simon,

Deutsch, Folke, & De Groot, 2003). Weak sustainability can be further defined by the technological optimist's approach. This optimistic approach strives to overcome energy and resource limits through the clever development of innovative technologies and differentiates the human system from the natural system (Costanza, 1989). Pessimists take on strong sustainability with an emphasis on resource constraints. The pessimistic approach underlines that technology will not evade fundamental energy and resource constraint and that economic growth will ultimately come to an end. (Costanza, 1989).

Natural resources and ecological services build earth's life support system and are the primary source of input for economic growth. Sustainability of the system rests on the capacity and ability of this ecological system to support the present and the future. To deal with the scarcity and depletion of non-renewable resources, limits need to be applied on consumption rate and quantity available for consumption over a period of time (Tietenberg & Lewis, 2016).

Once established that we need to think about certain resources which may not be able to meet the growing demand of human beings, or may deplete over a period of time, then we need to put them into an equation of economics. Similar to conventional economics, there are multiple approaches about valuating the argument of why to conserve, how to conserve, and what to conserve (Tietenberg & Lewis, 2016).

The New Urban Agenda and the United Nations Sustainable Development Goals (SDGs) have set new urban development standards. The objective set under the SDGs goal of Sustainable Cities and Communities is to make cities more safe, resilient, inclusive, and sustainable. In equality, one of the major concerns, has social, economic, and environmental consequences (UN, 2015). The New Urban Agenda complements and helps to implement SDGs' objectives to build cities with decent life, productive growth, shared prosperity, and social stability without harming the environment (UN-Habitat-III, 2016).

2.1.3 Sustainable Urban Development

Whether it is a matter of assigning limits to growth or dealing with common future, integrated sustainable development practices play a critical role in creating balance between each discipline (Clarke, MacDonald, Oradaeez-Ponce, Huang, & Roselan, 2016). Urban sustainability mainly

focuses on large-scale environmental and economic considerations, including social issues. Environmental sustainability at the local level highlights catchments, habitats of endangered species, and natural reserve areas mainly affected by urban developments (Atkisson, 1996). The economic aspect of sustainability of urban communities deals with a divergent range from metropolitan areas to small infill land. Urban sustainability is concerned with the balance of environmental, economic, and social aspects of the communities (Atkisson, 1996). Because of the multidimensional and complex configuration of urban systems, urban sustainability needs to deal with the local economy, energy consumption, recycling, usage of renewable resources, local pollution, and preservation of the natural environment, which are all key aspects of urban sustainability (Yigitcanlar & Dur, 2010). In addition,, the provision of urban services such as, health, education, recreation, income opportunities and securities, demographic changes, social and gender equity, poverty, and quality of life, are key indicators of social sustainability of urban communities (Yigitcanlar & Dur, 2010). To summarize sustainable development, we need to deal with its multi-directional components of sustainability along with its development while satisfying its three dimensions of economic, environmental, and ecological aspects to achieve social wellbeing.

Coming down from a global, regional, and country level, a city's operation and growth contribute immensely to environmental and social problems. Apart from such local impacts as pollution, cities play a significant role in creating trans-border effects such as waste water flow, waste disposal, and greenhouse emissions (Camagni, Capello, & Nijkamp, 1998). Therefore, cities can be a starting point when developing with consistency sustainable policies, global environmental policies, and decision-making (Camagni, Capello, & Nijkamp, 1998). A sustainable city refers to the ability of maintaining and increasing the quality of positive externalities, such as health and social welfare, by integrating economic, environmental, and social dimensions (Camagni, Capello, & Nijkamp, 1998).

Coordinated transport and land use planning is a major step towards sustainable urban development (Nilsson, et al., 2014). Core infrastructure, including roads, mass transit, airports and electricity production and distribution, and water/sewer systems, holds the utmost descriptive power for efficiency and joint necessity in fostering economic growth (Aschauer,

1989). Public and private involvement with interaction between stakeholders is a precondition to sustainable urban development (Evans, Joas, Sundback, & Theobald, 2005; Clarke & Fuller, 2010).

The role of infrastructure in economic development is highlighted as *"Extensive and efficient infrastructure [is critical for ensuring the effective functioning of the economy, as it is an important factor in determining the location of economic activity and the kinds of activities or sectors that can develop in a particular instance*" (WEC, 2013; page 05). Real estate is one of the major contributors of urban economic activity, but at the same time unutilized developed residential land, market manipulation, and environmental cost are creating negative externalities. The effectiveness of urban land development, particularly for residential purposes, will be questioned if developed land is not serving its purpose (the construction of houses), but rather treated as a trading commodity. In addition, land price speculations, affordability, and income inequality are also creating negative impacts on the social and economic structure.

Urban sustainable development is mostly affected by the inherently interdependent urban form, transportation, and infrastructure and their impacts on the environment (Yigitcanlar & Dur, 2010). The quality and comprehensiveness of infrastructure expressly impact economic growth and reduce income inequalities and poverty in many ways (Easterly & Levine, 1997). To avoid short supply of infrastructure, states should bid for the more basic and capital-intensive infrastructure projects, where capital and maintenance financing can be covered by imposing a user fee (Gramlich, 1994). Balanced investment in all categories of infrastructure development is necessary to maintain balanced economic growth (Ball & Wood, 1996). At the same time, city structural features and social and economic sorting shape city inequalities (Owens, 2015). Moreover, negative impacts on the environment of urban land use, urban form, demography, and transport determine the long-term viability of urban living (Yigitcanlar & Dur, 2010).

Apart from urban development, urban functions, including operations and maintenance, are also central to defining urban quality of life. To perform those functions, revenue generation plays a key role in urban operations and development. Urban operational revenues are generated through municipality services and other economic activities created with the locality (Cairns,

Clarke, Zhou, & thivierge, 2015). However, economic activities related to land development may have environmental consequences, including consumption of farm land, urban sprawl, price speculation, affordability and inequalities in terms of income generation and quality of life within the urban environment. Urban finance, real estate development, and urban sprawl are discussed in detail in the coming sections.

2.1.4 Urban development finance

Urban infrastructure is long lived capital facilities to provide services to household and enhance private sector production (Alm, 2015). It is primarily the responsibility of municipalities or city governments to deliver and maintain urban infrastructure, (FCM, 2012) which comprises physical structures such as roads, communication structures, and essential services, including water supply, waste collection and disposal, and sewer systems (i.e., fundamental municipality functions essential for societal living conditions) (Fulmer, 2009).

Cities in developing countries are gaining increased importance due to the increase of urban poor living in municipalities: from 25% in 2010 to 50% in 2030 (Ravallion, Chen, & Sangraula, 2007). Better infrastructure is indispensable to addressing a municipality's problems such as crowded cities, pollution, crime, and management (Alm, 2015). Poor economic management leads to faulty infrastructure; therefore, poor management needs urgent attention to improve quality of services (Alm, 2015).

Infrastructure development is considered a local phenomenon so countries are shifting from a centralized system to a decentralized governance system as responsive governance of urban development and financial management (Ahmad & Talib, 2010). Due to a stronger supply side alignment, urban infrastructure is most often emphasized. Whereas, the demand side aspect (i.e., value of the service that flows from infrastructure stock for individuals and business) is often neglected, it must be taken into consideration when determining the requirements of the infrastructure investment (Alm, 2015). In addition to its supply potential, infrastructure demand is not only directly linked to economic growth, but provision of services also affects the distribution of wealth (Alm, 2015). Success of the urban infrastructure depends on its fulfilling local community and growth requirements. As per the empirical evidence, the four major local

factors that affect the success of development projects are: need-based assessment, access to information, capacity building, and people participation (Ahmad & Talib, 2010).

Infrastructure investments have a positive impact on increase of income and quality of life (Munnell & Cook, 1990) and also assist in raising the production capital of marginal products (Fedderkea, Perkins, & Luiz, 2006). There are mix responses regarding social expenditure productiveness and impact on growth (Kelly, 1997). Social expenditure impact on economic growth rather than on education is often ignored. (Wu, 2010) However, high education investments provide better impact on economic growth than investments in physical infrastructure (Florida, 2002).

A substantial relationship exists between public expenditures and private sector investment (Munnell & Cook, 1990). Public capital accelerates growth at the initial level but at a certain public capital increase level, public capital creates distortion in the private sector, thus reducing economic growth (Kelly, 1997).

The common method of analysing the public capital investment impact on economic activity is by estimating the production process which requires input from public capital (Kelly, 1997). For steady growth and better economic performance, deficiencies in meeting demands and fulfillment of needs can be addressed by sensible infrastructure investments (Wu, 2010) and provide access to additional productive opportunities by connecting to core economic activities (Seethepalli, Bramati, & Veredas, 2008)

Financial performance capability of the local government is usually assessed by the following Indicators: (Alm, 2015)

- Local government revenues and ratio of borrowing
- Central Government Capital Grant: imbalances
- Public private partnerships
- Privatization and outsource to private sector
- Revenue sources from land and assets

- Revenues – Cost recovery, etc.

Integrated financial and infrastructure management by creating balance between economic growth and development is vital for sustainable and balanced urban development. Under the pressure of globalization, cities of developing countries are changing priorities by ignoring basic needs and diverting financial resources towards high end infrastructure, intimating the present priorities of developed cities (Mahadevia, 2006).“*A nationwide effort to improve essential urban infrastructure for the poor can succeed only through a comprehensive and inclusive problem analysis, followed by the development and testing of innovative finance mechanisms and technical solutions, and institutional strengthening*” (IHC, 2011; P.03).

2.2 Financialization

The rapidly changing financial markets and financial organizational structures are emerging into a new form of economic system (Theurillat et al. 2010). This transformation has had a great impact on countries’ economic and spatial development (Theurillat et al. 2010). The domination of financial markets over traditional economies is referred to as financialization (Sawyer, 2013). Financialization has existed for many years in various forms, emerging over time and space. Its present form emerged after 1980 together with neoliberal and globalization (Sawyer, 2013).

The concept of financialization was first introduced by post-Keynesian neo-Marxist authors. It was defined as a “pattern of accumulation in which profit making occurs increasingly through financial channels rather than through trade and commodity production” (Krippner G. R., 2005, p. 174), along with the growing influence of those channels on economic and political functions of daily life (Harvey, 1978; Harvey, 2004; Smith, 1996).

Epstein defines it as follows: “Financialization refers to the increasing importance of financial markets, financial motives, financial institutions, and financial elites in the operation of the economy and its governing institutions, both at the national and international level (Epstein, 2001, p. 1).”

Over the past few decades, the rise of the financial sector and financial markets has created a multitude of meanings of financialization, differing theoretical approaches, and scale of analysis (Pike & Pollard, 2010; French, Leyshon, & Wainwright, 2011). The most common approaches

about financialization revolve around finance-centric political economy (Pani & Holman, 2014) , corporate-centric political economy (Krippner G. R., 2011), focusing on shareholder value (Froud, Johal, Leaver, & Williams, 2006). In addition to these, another approach is cultural economy which deals with everyday forms of finance (Langley, 2014; Lai & Tan, 2015).

Although all theoretical and conceptual approaches of financialization are fundamentally the same, but cannot be reduced to one definition (Christophers, 2015) because of its multidimensional economic, political, and cultural relationship, financialization is reshaping not only the global financial system, national political economies and firms, but also affecting households and individuals alike(Godechot, 2016) .

Financialization exists both in the real world as well as in theory, but it is still evolving as a concept and as a productive way of analysis. It is necessary to practise the concept of financialization as sensibly and specifically as possible due to its analytical limits (Christophers B. , 2015) .

There is a vital role played by conventional economic theory in promoting financialization (Palley, 2007) and it represents interrelated features of transformed capitalist economies. These features are: large corporations acquiring financial capacities with reduced reliance on banks; a shift in banking toward mediation and transaction with households; and increasing involvement of households in financial operations (Lapavitsas, 2011).

At both the macro and micro level, financialization has infected industrialized economies (Power, Epstein, & Abrena, 2003; Jayadev & G., 2007) and has transformed the economic system by dominating the financial sector over the real sector and switching capital from the real to the financial sector (Stockhammer, 2012; Palley, 2007), resulting in income inequality and unproductivity (Palley, 2007) .

The financial sector has a negative impact on growth beyond a certain point because of the positive relationship between financial sector growth and decrease in growth volatility becoming weaker over time (Beck, Degryseb, & Kneer, 2014). Financial instability and speculative economy prevailed the people's livelihood (Goldman, 2010), putting social life at risk such as energy and food crisis that preceded the financial crisis triggered in particular market (FESSUD, 2011). The financial sector's rapid growth in both developing and developed countries has placed the

financial sector at risk in relation to the whole economy (Beck, Degryseb, & Kneer, 2014; Sawyer, 2013)

There are serious concerns around the sustainability and durability of financialization system growth and increasing fragility due to increasing debt-income ratios and corporate debt-equity ratios (Palley, 2007) . Because of debt constraints, economy is highly susceptible to debt-deflation, persistent recession (Palley, 2007), income polarization (Stockhammer, 2012), and productivity disconnect with rising income and wealth inequality (Mishel, Bernstein, & Allegreto, 2007). During the last twenty years, several financial indicators were correlated with rising inequality (Kus, 2013; Dünhaupt, 2014; Flaherty, 2015), confirming the impact of financialization on income distribution and inequality (Godechot, 2016).

Financialization of households can be referred to as guiding household's savings into securities (Montagne 2006) and using debts such as mortgages, consumer credits, or student loans to maintain or increase standard of living during slower growth or crisis (Streeck, 2014; Poon, 2009). Debt, as major component in financialization of household, could have a significant contribution in bursting the financial bubble (Jordà, Schularick, & Taylor, 2014) . Moreover, debt contributes to inequalities such as low-cost loan access to rich households and utilization in lucrative investments (Fligstein & Goldstein, 2015; Denk & Cournède, 2015). Conversely, provision of high-cost loans to maintaining life standards by poor. (Kumhof, Romain, & Pablo, 2015).

2.2.1 Financialization in urban context

The neoliberal approach to growth conflicts with urban sustainability ideologically and materially, as well as in terms of ecological limits, intra and intergenerational equity and integration of economic, social, and environmental priorities in decision-making and policy-making (While, Jonas, & Gibbs, 2004). Urban development patterns, with an increased level of material flow and consumption and negative environmental impact on open spaces, are often at the expense of local communities suffering from economic and environmental consequences. It is also evident that negative externalities of urban growth do not influence urban growth politics much and are increasingly dependent on local economic and political elites (While, Jonas, & Gibbs, 2004).

The financialization impact on the urban landscape has not been studied extensively within urban geography (Clark, 2006). Sustainability development has received even less attention; and, in particular, the transformation of the city landscape due to the simultaneous interaction of financialization and sustainable development (Theurillat & Crevoisier, 2014).

Urban financialization is not simply financial accumulation, it is geographical concentration of finance (Wójcik, 2009) that deals with territorial bound cities; therefore, scalar definitions of financialization may not be sufficient (French, Leyshon, & Wainwright, 2011).

Financialization creates a number of financial centers and centralizes the management of economy by accumulation (Harvey, 1978, 2004; Smith, 1996) of investment in major cities. Opposing innovation and decentralization, features of a real economy such as investment location, characteristics, and technical specificity becomes irrelevant in financialization (Theurillat et al. 2010).

Financialization at the urban scale or the urban form has emerged in the form of mortgage markets and, most recently, financialization of urban infrastructure and redevelopment (Leyshon & Thrift, 2007). By converting assets to valuable market assets, the secondary sector becomes highly dependent on the quaternary circuit, mortgage markets extended its scope by switching capital from secondary to quaternary circuit (service support consultancy) of capital in addition to its fundamental design to facilitate capital switching from primary (production) to secondary circuit (built environment) (Aalbers, 2008; Christophers, 2010; Kaika & Ruggiero, 2013), thus leading to over-accumulation.

The growing domination of finance into the urban structure influences urban policy and governance, turning every feature of urban life into a financial asset (Leyshon & Thrift, 2007), and confirming financialization of urban space and forms.

Financial accumulation is not the only feature to be associated with urbanism. Urbanism is rather a more crucial socio-spatial process, integrating finance into the fabric of the household (Moreno, 2014). Instability of financial growth leading to economy and social crisis due to financial speculation creates problems of inflation, affordability, household debts, income distribution, and increases in inequality.

2.2.2 Real estate financialization:

Many studies have shown the relationship between property market and finance. In addition to that, research has been done on the role of financial institutions, pension funds and their impact on property market, intensity of financialization, favored type of development (Theurillat et al. 2010), the decision-making process (Clark, 2003), and the impact of accumulation of funds (Martin, 1995).

Financialization has contributed to re-shaping the economic structure, but the role of the real estate/property market in this transformation is either neglected (Froud, Haslam, Johal, & Williams, 2000; Boyer, 2000a; Orle´an, 2000) or limited to some indirect consequences of involvement of funds in regenerating urban centers (Hagerman, Clark, & Hebb, 2006).

The real estate market is driven by demographics, product innovation, and types of economic activities in the region (Thomas, 2017). Moreover, cyclic drivers include economic growth, interest rates, new supply, and consumer and business spending behaviors (Thomas, 2017). The property market is highly fragmented and bears regional characteristics, lack of liquidity due to high transaction cost, deficiency of transparency, and information (Theurillat et al. 2010).

The real estate development process operates under various models by incorporating institutions, organizations, individual actors and their behaviours, and path events and their interrelationships (Squires & Heurkens, 2016). These models explore the forces that drive the dynamics of real estate development and defines its relationships (Healey, 1991).

Property as sphere of investment (Ball, 1986) has fundamentally structural interdependence between finance and real estate (Ball, 1986; Pryke, 1994; Lefebvre, 1991; Healey, 1991). Although property development and investment around the globe has changed radically, similar trends can be found in the property boom in developing countries and in the search for new development models in developed countries (Squires & Heurkens, 2016). Similarities in real estate development trends are attributed to local circumstances, path followed, and institutions (Squires & Heurkens, 2016).

Real estate is fully integrated with the financial market through the process of financialization of urban assets (Harvey, 1978; Harvey, 2004; Smith, 1996). It happens when land is valued strictly

on financial grounds and becomes a form of fictitious/interest bearing capital like bonds, stocks, or debts (Christophers, 2010).

Capital availability for real estate and urban development relatively depends on performance of disparate financial assets such as stocks, bonds, and favorable returns (Rutland, 2010). Such capital accumulation into property development is encouraged through innovative financial instruments and public consent for pro-development and anti-political regulatory changes. All such changes in economic and financial regulations and practices have allowed investors to use property as a financial asset, and is a common approach of shareholders value creation (Rutland, 2010).

In addition to capital accumulation (Harvey, 1978, 2004); Smith, 1996) by capital switching in the built environment through the conversion of land as financial assets, surging profits have also played a vital role in the process of capital accumulation (Aalbers, 2008) due to its use value, monopoly rent and capital value gain through real estate (Harvey, 1982). Lucrative profits in property speculation have encouraged manufacturers to diversify into commercial activities instead of furthering technological investments in their industrial endeavours (Smart & Lee, 2003).

The fundamental forms of real estate funding are equity funding, loan capital, or a combination of both. Traditionally, equity funding was major source of real estate development. Equity funds are drawn primarily from individual savings and corporate income. Apart from savings, other sources of equity funds include funds from family sources, friends, and common pools such as committees, isusu, and thrift systems. Public equity funds are raised by public subscription to equities/ownership of Real Estate Company for the specific purpose (Ezimuo, Onyejiaka, & Emoh, 2014).

Primarily in Europe, individual savings deposits were collected into pension funds and invested in stock markets (Theurillat et al. 2010). Whereas real estate equity forms a larger proportion of the middle class, total equity in the United States and Britain are personally managed as opposed to pension funds (Byrne & Davis, 2001). Real estate is seen as a prime investment asset by many

households utilising savings and old age pensions (Vasoo & Lee, 2001); therefore, price fluctuation directly affects their consumption decisions (Smart & Lee, 2003).

From the literature, turning land into a financial asset and its social implications are very clear. The conflict of interest between local governance, private investors, and individuals seeking savings for the future is ultimately affecting housing supply and housing affordability. Privatization, profit-motivated investments, future savings and their funding sources play a key role in defining urban land development. Real estate market motivation and the decision-making process play a vital role in defining market norms. In the next section, real estate financialization and the decision-making process are further discussed in detail.

2.2.3 Real estate financialization and decision-making

Real estate development reflects the social and market demands in a specific context and are location dependent (Squires & Heurkens, 2016). Usually, while choosing the development site, key considerations are location, local transport infrastructure, proximity to employment, and easy access to shopping, schools, and recreational amenities (Thomas, 2017).

Real estate demand is driven by market size, income, prices of substitutes, and expectations (Wheaton & torto, 1990). An uncommon approach to buying and selling frequency (Altaprima & Ernst&Young, 2004), the property market is a practice in buying and holding in contrast to buying and managing, as practiced purely in the financial market (Theurillat et al. 2010).

In real estate, its demand equals supply approach is unable to address diverse demands, non-economic interests, uncertainty of development time scale, infrequent valuation methods, and overall development process complexity (Healey, 1991).

Changes in real estate demand is measured preferably by marginal shifts rather than by aggregate demand. Net absorption measure is the most appropriate indicator used to measure such changes (Sivitanidou, 2011). The net absorption measurement is the changes in market occupied stock, incorporating both aggregate demand that is the total amount of space involved and physical occupancy of space. The net absorption rate alone may not be sufficient to understanding market demand. For accurate assessment, it is important to know the

determinants of net absorption, including changes in rent, employment, income, or changes simply due to expectations (Sivitanidou, 2011).

Conventional economic theories and financial market practices are also influenced by behavioral finance (Crotty, 1990; Palley, 2007). According to rational expectations theory (Flood & Garber, 1980), rising prices encourage participants to rationally participate in bubbles. Similarly, risk neutral speculators who follow noise can lead to market inefficiency in the presence of risk averse traders (De Long, Shleifer, Summers, & Waldman, 1990; Crotty, 1990) The financial market based on subjective beliefs similar to betting produces nothing and uses valuable economic resources and socially wasteful non-productive investments (Hirshleifer, 1971)

Like Pakistan, most residential projects in India (Thomas, 2017)are developed and sold prior to commencement of construction based on the buyer's commitment to purchase units in advance. Development of the premium attraction from submarkets is the investors' key interest (Thomas, 2017).

According to Sivitanidou and Sivitanides, Investors in the real estate market behave "myopically" by generalizing current market movements on the future (Sivitanidou & Sivitanides, 1999). Investors get ready to accept current lower returns with expected future higher returns based on higher increases in the past (Sivitanidou & Sivitanides, 1999). Keeping in view the general investor's behavior, it is important to analyse real estate price change by considering both actual price and expected price increase. Expected future price increase will increase property demand, whereas actual price increase will impact negatively on current demand (Sivitanidou, 2011). Such pricing behavior in real estate has a direct impact on the single-family housing market. Actual price increase will discourage some households from buying property due to affordability, whereas expected future price may encourage other households to invest before prices further rise (Sivitanidou, 2011).

Consumer decision-making regarding real estate sale, purchase, financing and operation can be studied through consumer behavior models to understand the process itself and the factors affecting those decisions (Black, Brown, Diaz, Gibler, & Grissom, 2003). Determining what people

buy should not be the only intention, but understanding why people buy what they do and the process involved (Black, Brown, Diaz, Gibler, & Grissom, 2003).

Consumer behaviour plays a key role in the financialization of urban land. It defines market norms and development patterns by attracting private investors for high returns and market speculation (Guy, Henneberry, & Rowley, 2002). The direct involvement of consumers for both investment purposes as well as housing needs, financialization of real estate has social implications (Burns & Grebler, 1977; Smart & Lee, 2004). Interaction of financialization with the social fabric of the urban environment is discussed in the next section.

2.2.4 Real estate financialization and social interaction

The interaction between household decision-making, real estate development and capital accumulation is very complicated (Harvey, 1982). The transformation of the urban economy due to financialization (Harvey, 2004; Smith, 1996) within the urban context is studied in terms of changes in the form of political economy (Brenner & Theodore, 2002), financial assets, institutional changes in financial market, city governance, and policy-making (Theurillat & Crevoisier, 2014). Social endorsement of land financialization is still a subject needing to be examined (Kaika & Ruggiero, 2013). Urban spaces require analysis in terms of governance, conflicts of interest (Theurillat & Crevoisier, 2014; While, Jonas, & Gibbs, 2004), economic compromises of the environment, and social justice (Jonas & While, 2007).

Land financialization is socially embodied (Harvey, 1982), and conflicts between industrialists, workers, and local governance are key drivers of turning land into financial assets (Kaika & Ruggiero, 2013). The land through which the capital flows (Harvey, 1982) transmits its effect of economic changes on the urban structure (Haila, 1988). Transforming from family-owned to corporate capital, this new form of urbanity is unable to adopt social needs and lacks character, vibrancy, and socialization (Kaika & Ruggiero, 2013).

Housing is a major component of domestic economies both in terms of consumption and production. It has significant implications on inflation of wages due to the high cost of housing (Smart & Lee, 2004), wealth accumulation through house ownership, and its impact on social relationships (Lee E. , 1999; Forrest, Murie, & Williams, 1990; Kemeny, 1992). Housing prices have

a direct effect on quality of life (Smart & Lee, 2003), whereas home ownership can enhance the work ethic and increase family responsibility (Vasoo & Lee, 2001).

Privatization of housing is affected due to changes in economic conditions and shifts in investors' interests. Inherently it mostly harms disadvantaged low income and needy people (Kleit, Kang, & Scally, 2016). Private-sector profit-motivated decisions and conflicts of interest with the public sector (Guy, Henneberry, & Rowley, 2002; Lee J. A., 2015) creates a constricted environment with diminishing accountability (Lee J. A., 2015).

The consumption pattern of wealth varies depending on its source. In developed countries, household consumption carries a larger impact because of housing price changes as compared to the stock market (Case, Quigley, & Shiller, 2001; Vasoo & Lee, 2001). It is necessary to provide fundamental facilities to the public such as good housing, income security, good primary health, and education without hampering economic development and productivity (Vasoo & Lee, 2001). Comprehensive social services provided in industrial nations are very difficult to achieve in developing countries despite any attempts made towards this end. Such attempts were unsuccessful in the past. The developing countries of the Global South have remained underprivileged due to failure in mobilizing sizeable resources to meet the social needs (Vasoo & Lee, 2001).

The market embedded housing policy adopted in many Asian societies (Lee, Forrest, & Tam, 2004; Doling, 1999) led to over-investment in residential and commercial real estate (Henderson, 1999; Ronald & Doling, 2013). Over-leveraged households and under-capitalized banks with lack of proper monitoring and regulation have created adverse conditions for many institutions and households. Plunging real estate prices have adversely affected those who entered the market when prices were at their peak (Lee, Forrest, & Tam, 2004). During a financial crisis, in contrast to previous eras, property appreciation was assured, negative equity was prevalent, and the emergent middle class suddenly faced a higher risk future due to reduced job security and reducing income (Lee, Forrest, & Tam, 2004).

Urban development and the financialization of land development have had social, economic and environmental consequences. Developing economic activities through the financialization of

land, carrying not only the social values but also environmental consequences, defines overall urban sustainability.

2.2.5 Financialization and urban sustainability

Economic competitiveness is not the sole objective of cities, even those purely in a neoliberal environment (Theurillat & Crevoisier, 2014). Sustainability in cities forms part of the governance and institutional structure not only in the political and economic context (Krueger & Gibbs, 2008), but also in its need to respond to social and environmental demands (While, Jonas, & Gibbs, 2004).

Housing as an expensive necessity carrying social value should be subject to a minimum standard, promote equality, and intervene to control short supply and price manipulation (Barr, 2001).

Changes in housing demand cannot be readily adjusted due to such features as being location dependent and a long-term asset. Such attributes justify government intervention in this sector. The housing market on its own could result in inefficient housing and investment provisions due to poorly managed finance markets and household risk disconnected from costs and benefits analysis (Whitehead C. M., 2003). Small-scale individual decisions, such as land assembly by individuals or household real estate investments, may lead to inequality, monopoly, inferior quality, and high transaction costs. Poor supply adjustment, varied nature of stock, and complex forms of agreements tend to generate social and economic problems (Whitehead C. M., 2003).

The importance of home ownership for quality of life is poorly recognized in terms of the social costs and benefits for individuals (Burns & Grebler, 1977). Should housing be considered as providing benefits to owners or occupiers, or should it be considered more of a social provision that provides benefits to the overall community (Burns & Grebler, 1977). All such arguments support social provision and other forms of intervention.

Sustainable competitiveness can be anchored within urban development by involving financial investors who are developing city real estate in negotiation with urban social actors to protect the sustainability aspects of the local environment and the social structure surrounding the development project (Theurillat & Crevoisier, 2014). It is indispensable to address the

compromised solutions due to conflicts of interest between the objectives of financial viability and urban sustainability (Tajani & Morano, 2015).

Conventional or urban sprawl developments generate high development costs, have negative effects on public services, and instigate high consumption of ecologically sensitive land. There are, however, some benefits (Burchell & Mukherji, 2003) of conventional development or urban sprawls, which include the lower cost of single-family dwellings and public service expenditures (Burchell, Lowenstein, & Dolphin, 2000). But in this case governance is ignored (Burchell & Mukherji, 2003).

Managed growth is the most cost-efficient development model. Studying alternative models of development by considering housing types, location, occupancy rate, and densities of urban sprawl and managed growth compared with land conversion under various models (Duncan J. , 1989; Burchell, Lowenstein, & Dolphin, 2000; Burchell, Dolphin, & Galley, 2000) can provide insight into their merits and demerits. As compared to smart or managed growth in the US, sprawl increased land conversion by 21%, local road lanes in miles by 10%, annual public-sector expenditures by 10%, and higher occupancy cost by 8% (Burchell & Mukherji, 2003). Through efficient and managed alternative growth patterns, the US can avoid more than 21.3% of land conversion without compromising growth potential and housing markets (Burchell & Mukherji, 2003).

Sustainable urban development can be promoted by reducing land consumption and realization of quality social housing (Tajani & Morano, 2015). Irreversible effects of urban sprawl through the reduction of agricultural land (Lorencovà, Frelichovà, Nelson, & Vackà, 2013) causes damage to ecosystems (Houghton & Goodale, 2004).

From the literature, we can determine two aspects of urban development and financialization, one is the encouragement of financialization and the other is its consequences on the urban environment. The finances required for urban development, operations, and governance, along with individual consumers' savings are needed to attract profit-seeking investors (Guy, Henneberry, & Rowley, 2002). The involvement of financial institutions and big individual investors in the real estate market for higher and lucrative returns encourages market

speculation with increased financial risk for consumers. Profit-seeking motivations further define market and land development practices to facilitate investments rather than meet the needs for housing (Smart & Lee, 2003). Market speculations increase land and housing prices, resulting in increased inequality and affordability issues (Whitehead C. M., 2003). In addition to social issues, land development through the conversion of agricultural land into inefficient paved impervious surfaces, longer commutes between home and workplace, with its inability to meet the fundamental need of housing, results negatively on the environment. Keeping in view profit-seeking motivations in urban land development and the social, economic, and environmental consequences, financialization of urban land development has a negative influence on overall urban sustainability (Lorencovà, Frelichovà, Nelson, & Vackà, 2013; Houghton & Goodale, 2004). In this study, financialization of land development is considered in terms of the local real estate market, an investment mechanism driven primarily by individuals instead of by financial institutions. Real estate development and operation, in the local context of the study area, is dependent on individual investments in property under profit-seeking and saving objectives. Land financialization under the influence of individual decision-makers, in the local context, is the unique aspect of this study.

2.3 Development impact assessment

Economic growth is necessary for healthy communities as it drives economic activities to create jobs, increase income, and enhance cultural activities. By consequence, economic growth also inserts stress on communities such as increased expenditures on infrastructure, urban issues, and degradation of the environment (Edwards, 2000). Development decisions are often made without understanding the consequences on residents' overall well-being both in the short and the long run of development plans. Changes induced by any development may not bring positive impacts, thus only a carefully planned development can ensure consistent economic growth in the long run (Edwards, 2000). To understand the consequences of any development project, it is necessary to assess the possible impacts on the community before undertaking any development decision. Development impact assessment provides a decision framework by which planners and decision-makers can understand ahead of time any possible adverse effects along with any good

ones. Impact assessment not only provides time to amend project features, but also incorporates mitigation measures within the plan (Biemann, et al., 2005; Weber O. , 2013).

Development impact assessment looks at possible impact areas, including the economy, the environment, and society. Assessment of each of these impact areas employs various techniques such as identification of sub sections of each domain, collection of existing data, and field studies, and it employs new techniques wherever necessary to meet specific demands (Biemann, et al., 2005; Weber O. , 2013). Development impact assessment provides a decision framework by integrating data, models, and spatial and statistical analysis to predict future impacts and consequences (Edwards, 2000). Separate as well as integrated impact assessments are required for every aspect of society, the environment, and the economy. Impact assessment is usually performed through a cost benefit analysis, cost effectiveness, multi-criteria analysis, risk analysis (Tamborra, 2002), and return on investment in terms of the financials as well as the social benefits (Biemann, et al., 2005; Weber O. , 2013). Quantitative and qualitative tools, using analytical methods and participatory approaches to manage large multi-disciplinary groups of stakeholders, are important components of socio-economic impact assessment (King, 1998; Edward, 2000; Tamborra, 2002, Chau, 2014).

In this study, development impact assessment is an important tool for assessing land development practices in the city of Islamabad and their impact on the environment in terms of conversion of land and increased impervious surface, liveability issues due to low density, cost effectiveness and utility, social consequences of housing shortage, and affordability.

In conclusion, the literature shows that urban structures and growth patterns of developing countries in particular play an important role in human wellbeing and livelihood. The cumulative impact of growth on the local environment, social structure and economic activities threatens overall sustainability of the region. Financial constraints, lack of knowledge, and poor planning are affecting the efficiency of developing countries and sustainability of urban developments. Infrastructure investments through both public and private financing need better and coordinated plans to achieve integrated growth and improved efficiency of development. Thus, it is significant to assess the impacts of current decisions, selections, and levels of coordination

between public and private spending in terms of delivering socioeconomic and environmental benefits. Socioeconomic impact assessment of current practices will pave the way to formulating the decision-making framework, the development of input/output modeling, and the multi-criteria evaluation for urban development financing.

2.3.1 Sustainability assessment methodologies

Economic and ecological approach has dominated concepts of sustainability in planning. Urban sustainability is described in various ways, including defining the state and set of conditions (Adinyira, Seifah, & Kumi, 2007), or balancing the resource consumption and disposal with respect to the surrounding environment of urban structure (Kennedy, Cuddihy, & Engel-Yan, 2007).

There are two fundamental concepts involved in the assessment process; one is assessment methodology and the other uses a set of indicators to measure sustainability (Kennedy, Cuddihy, & Engel-Yan, 2007). Using built environment quality evaluation for sustainability through time (BEQUEST) framework has identified various approaches towards sustainability assessment in the literature (Deakin, Lombardi, & Mitchell, 2002; Ugwu & Haupt, 2007). These assessment methods are primarily based on three fundamental approaches: environmental assessment, lifecycle assessment, and sustainability assessment (Kennedy, Cuddihy, & Engel-Yan, 2007).

These methods are then based on several indicators that mainly revolve around economic, social, environment, and governance aspects (SEP, 2015; Adinyira, Seifah, & Kumi, 2007) such as theme-based indicators (Huang, Wu, & Yan, 2015). These indicators are used to understand the interacting effects between urban infrastructure and its economic, social, and environmental systems established through governing regulations (Adinyira, Seifah, & Kumi, 2007).

Sustainability indicators' effectiveness cannot not be achieved in isolation, but needs to assess the state of the environment and the changes taking place over a period of time (Adinyira, Seifah, & Kumi, 2007; Huang, Wu, & Yan, 2015). Assessment of urban sustainability by using sustainability indicators, such as DPSIR (Driving forces, Pressures, States, Impacts, Responses) framework and similar other indicator sets, had mixed results particularly when defining the complex relationship between socio-economic and governance factors (Gari, Newton, & Icely,

2015; Cooper, 2012). Due to the difficulty in interpreting the results and assessing the progress towards sustainability, most of the currently available methodologies are unable to sufficiently describe the interrelationships and interdependencies of the economic, social, and environmental considerations (Adinyira, Seifah, & Kumi, 2007). Urban sustainability indicators are facing problems related to issues of standardization, weighting, and upscaling (Huang, Wu, & Yan, 2015). There are also some conceptual issues that persist, such as selection of indicators, boundary delimitations, diversity, scale, and determination of weak and strong sustainability (Huang, Wu, & Yan, 2015).

There are a number of methods in practice around the world, and despite their limitations, sustainability indicators are the proven method in determining sustainable urban development. However, choosing the appropriate indicators, according to a specific set of conditions to fulfill the basic requirement of addressing social, economic, and environmental interdependencies within regulations, plans, and projects, is the prime objective (SEP, 2015; Adinyira, Seifah, & Kumi, 2007). Although the indicator selection process is "*inherently very subjective*" and mainly depends on value judgement (Morse, Vogiatzakis, & Griffiths, 2011), to reduce uncertainty, it is recommended to follow theme-based (Environment, social, economic, & Institution) frameworks along with consideration of project objectives, scale, and weak vs. strong sustainability (Huang, Wu, & Yan, 2015).

Considering the objective of this study and its unique local conditions, the theme-based framework was opted to study sustainability of the urban development by exploring the relationship between financialization, urban development practices, and sustainability. Low density urban sprawl has proven environmental, social, and economic impacts due to loss of green land, increased cost of living, inequality, and other related social and environmental consequences. In the local context, a low-density urban residential development was studied in terms of its occupancy rate and its utilization of developed land for purpose of housing, and its relationship with market motivation in terms of the financialization of urban land development practices. Walkable communities are more sustainable and environmentally-friendly, and have a positive impact on economic and social aspects. For this study, walkability of selected communities was studied in relation to occupancy trend to assess sustainability of local practices.

2.3.2 Measuring urban sprawl

There are various aspects associated to urban sprawl, one is defining sprawl and then exploring the causes and consequences of the development. All these aspects should be distinguished from each other (Galster, Hanson, Wolman, Coleman, & Freihage, 2001). Sprawl is defined by Galster et al. (2001) in terms of its *pattern* of spatial mix of the urban development at a certain point in time, and its *process* as the spatial structure of cities evolves over time.

The predominant characteristics of urban sprawl observed in the literature are: irregular and endless city boundaries, polycentric urban developments, strip and ribbon commercial properties, and scattered developments with fragmented open spaces (Oueslati, Alvanides, & Garrod, 2015). All these characteristics are interdependent; therefore, it is difficult to measure urban sprawl into a single metric (Parent, Angel, & Civco, 2007; Oueslati, Alvanides, & Garrod, 2015).

From the literature, five fundamental attributes that emerged are: (Parent, Angel, & Civco, 2007)

1. Emergence of endless cities by extending beyond walkable range
2. Consumption of land resources with consistent decline in urban densities
3. Low-density urban centers with increasing trend toward suburbanization
4. Reducing proximity, scattered and irregular developments with fragmented open spaces
5. Increased compactness in suburban and extended boundaries

To measure urban sprawl, the most common factor used is density. In addition to density, the distance from the urban center, continuity, concentration, land use mix, and centralisation are also used to measure urban sprawl (Terzi & Bo¨len, 2012). More complex and advanced spatial analysis techniques, such as geographical information system, earth imaging, and remote sensing, have been used to determine urban expansion patterns (Terzi & Bo¨len, 2012).

Due to the multidimensional aspects of urban sprawl, urban sprawl needs to be measured in a particular way, as evident from the literature, and it is necessary to examine the issue by using more than one dimension in contrast to previous empirical studies that only used a single

dimension of urban sprawl (Oueslati, Alvanides, & Garrod, 2015). The fundamental dimensions of sprawl identified are: spatial scale, population density, and scattered urbanisation (Chin, 2002).

The fundamental need for city expansion and compactness revolve around: housing needs due to increased population; increase in income leading to single-family housing demand; commuting cost and increase in agriculture land price forcing people to stay on urban land; and increasing density (Oueslati, Alvanides, & Garrod, 2015). In contrast, urban sprawl is also based on the above-mentioned principles if not managed properly. Increase in city population and urban center's rising costs will result in the formation of urban fringe. Increased income will change individual preferences by adopting single-family suburban housing. The changing modes of transportation will also lead to expansion or relocation. And, last but not the least, rural land prices will determine market interest and level of expansion (Parent, Angel, & Civco, 2007; Oueslati, Alvanides, & Garrod, 2015).

In addition to geographic and spatial scale of sprawl measurement, various economic and social variables are also used to determine sprawl. Various studies conducted in the US found agriculture land cost, population increase, and income level statistically significant determinants of urban land area, whereas the impact of cost associated with commuting was ambiguous (Brueckner & Fansler, 1983; McGrath, 2005; Song & Zenou, 2006). Studies between 1976 and 1992 concluded that urban sprawl in the US established a positive relation with decentralised employment, public transport infrastructure provision, uncertainty of urban growth, rugged terrain, climate change, availability of groundwater and inefficient public service investments in terms of delivering benefits to local taxpayers (Oueslati, Alvanides, & Garrod, 2015). Whereas in developing countries like China, income growth, industrialization, and service sector growth influenced the growth of development (Deng, Huang, Rozelle, & Uchida, 2008; Shanzi, Song, & Ming, 2009). Various other variables are also used such as ethnic composition of population and crime rates, etc. (Selod & Zenou, 2006; Freeman, Grogge, & Sonstelie, 1996)

It is necessary to differentiate between features and indicators of urban sprawl. Various types of sprawl are basically independent of each other. The urban landscape, for example, may

experience scattered developments, ribbon developments, or the formation of a secondary urban center, but not all three (Parent, Angel, & Civco, 2007). Urban development, due to its multidimensional aspects, needs careful and context-specific research and data collection methodologies. Details of various methods are discussed in the coming sections.

2.3.3 Walkability assessment by Walk Score

Neighborhood walkability refers to the walking access to basic amenities such as stores, schools, banks, parks, etc., including design features of the community such as sidewalk access and street connectivity (Lo R. H., 2009). Various methods are used for measuring walkability, including the use of field observation, self-reported information, and GIS data. The self-reported method is always considered as biased (Diez Roux, 2007), whereas systematic field observation is time-intensive and has logistic constraints. Although using GIS data for measuring walkability is quite reliable, it still requires a specialized skill and is also time-intensive (Matthews, Moudon, & Daniel, 2009).

Walk Score, a publicly available online tool, is well recognized for studying community walkability (Duncan, Aldstadt, Whalen, Melly, & Gortmaker, 2011). Walk Score is widely acceptable due to its global scale and up to date record (Duncan, Aldstadt, Whalen, Melly, & Gortmaker, 2011) (Carr, Dunsiger, & Marcus, 2011). Walk Score calculates a score of 0 to 100 for community walkability. This score uses amenities such as schools, libraries, parks, stores, etc., by analysing multiple routes to the amenities from a specific address (WalkScore, 2017). By using the decay function (WalkScore, 2017), amenities within 0.25 miles or a five-minute walk are given maximum points and a zero point beyond a 30-minute walk. Walk Score analyzes population density, and road metrics using block length and intersections (WalkScore, 2017). Walk Score from 0 to 100 is further categorized into five categories with respect to walkability ranging from completely car-dependent communities to a walkers' paradise where people do not need a car for their daily errands (WalkScore, 2017). Walk Score is considered a valid tool for measuring certain aspects of neighbourhood walkability (Matthews, Moudon, & Daniel, 2009), particularly within the buffer zone of 1600 meters. Moreover, Walk Score estimates walkability on multiple spatial scales and multiple locations (Duncan, Aldstadt, Whalen, Melly, & Gortmaker, 2011).

2.3.4 Data collection methods

There are a variety of methods used to collect data based on sustainability indicators. These methods can be based on qualitative, quantitative, or mixed designs. Quantitative indicators can be based on secondary sources of national and municipality data, whereas special statistical or scientific surveys can be adopted for primary data collection (Seasons, 2002). Specific indicator measurements, such as cost utility analysis, can be achieved by assigning utility value weightage and by calculating cost utility ratio (Girginer & Kaygisiz, 2013). In addition, on-site data collection is used to estimate cost of service delivery to assess productivity efficiency (Stevens, 1984). Financial performance is assessed by evaluating balance sheets and changes in assets over a given time period (Earley, Feng, & Kelly, 2015). Indicators based on perceptions, feelings, and values calls for close attention. Such qualitative sources can be based on semi-structured surveys, case studies, interviews, and focus groups. In urban assessments, the common data sources are secondary rather than primary (Seasons, 2002).

The development impact in any specific location is assessed in terms of its socioeconomic and environmental effects. Environmental effects include loss of green land, increase impervious surface, air quality, loss of wildlife habitat, and landscape aesthetics (Edwards, 2000). Socioeconomic consequences include the study of inequality, affordability, income and employment, market effect, and public services (Edwards, 2000). Built environment form, quality, and utility directly interact with the natural environment and residents' social and economic wellbeing.

In the specific context of this study and its objectives, to find the forces that drive land development and its impact on urban sustainability resulting from urban sprawl, market motivations and efficiency of land development were studied. The market motivation was studied by assessing individual motivations in real estate investment, whereas sustainability of urban land was studied by assessing its utility and efficiency. The utility of the land development was assessed by analyzing rate of construction of housing on developed land as its primary objective, whereas Walk Score indicator was used to assess efficiency of developed land in terms of provisions of basic amenities in residential neighbourhoods and its relationship with occupancy.

2.3.5 Summary of literature review

The complex interrelationship between sustainable development and its components of social, economic, and environmental development, as well as with its associated dimensions of wellbeing, always calls for sufficient and efficient strategies (Ciegis, Ramanauskiene, & Martinkus, 2009). A sustainable city accommodates economic, environmental and social dimensions along with health and social welfare (Camagni, Capello, & Nijkamp, 1998). Core urban infrastructure, including integrated transport and land use planning, plays a vital role in sustainable urban development (Nilsson, et al., 2014) and in the reduction of inequalities and poverty (Easterly & Levine, 1997).

Increasing the urban population in developing countries (Ravallion, Chen, & Sangraula, 2007) is facing problems associated with crowded cities, pollution, crime, and management due to poor financial structure, faulty infrastructure, and inferior management in general (Alm, 2015). By ignoring the basic needs of the general populace, cities of developing countries are focusing on investments in expensive infrastructures by following the present requirements of developed cities (Mahadevia, 2006). The success of development projects always depend on need, access to information, international capacity, and participation. (Ahmad & Talib, 2010).

Furthermore, domination of the financial sector in urban infrastructure development is turning every feature of urban life into a financial asset (Leyshon & Thrift, 2007). Due to serious concerns about sustainability of financialization system growth and fragility (Palley, 2007), the economy is highly susceptible to debt-deflation, persistent recession (Palley, 2007), income polarization (Stockhammer, 2012), and productivity disconnect with rising income and wealth inequality (Mishel, Bernstein, & Allegreto, 2007). Land conversion to a financial asset is attracting various sources of finance (Harvey, 1978; Harvey, 2004; Smith, 1996; Aalbers, 2008), including corporate income, individual savings by equity funds, family contributions, friends, and common pools (Ezimuo, Onyejiaka, & Emoh, 2014). Various forms of individual savings, as major source of real estate investment, individual decision-making process forms a complex relationship with real estate development and capital accumulation (Harvey, 1978).

The urban economic transformation due to financialization (Harvey, 1978; Harvey, 2004; Smith, 1996), particularly in an urban context, is studied only in terms of the political economic changes (Brenner & Theodore, 2002), financial assets, and institutional changes in the financial market, city governance and policy-making (Theurillat & Crevoisier, 2014). However, the impact of financialization on the urban landscape has not been studied extensively within an urban setting (Clark, 2006). Similarly, sustainability development has received even less attention; particularly, the transformation of the city landscape due to the simultaneous interaction of financialization and sustainable development (Theurillat & Crevoisier, 2014). The role of the real estate/property market in this financial transformation is also either neglected (Orle´an, 2000; Boyer, 2000a; Froud, Haslam, Johal, & Williams, 2000) or limited to some indirect consequences with regard to the involvement of funds in regenerating urban centers (Hagerman, Clark, & Hebb, 2006). In addition, the social endorsement of land financialization is still a subject to be examined (Kaika & Ruggiero, 2013). In short, urban spaces need to be analysed in terms of governance, conflicts of interest (Theurillat & Crevoisier, 2014; While, Jonas, & Gibbs, 2004), economic compromises over the environment, and social justice (Jonas & While, 2007).

Economic competitiveness is not the sole objective of cities (Theurillat & Crevoisier, 2014). Sustainability in cities forms part of the governance and institutional structure, not only in a political and economic context (Krueger & Gibbs, 2008), but also in response to social and environmental demands (While, Jonas, & Gibbs, 2004). Housing, as an expensive necessity carrying social value, should be subject to a minimum standard, promote equality, and intervene to control short supply and price manipulation (Barr, 2001).

Conventional or urban sprawl developments carry high development costs, negative effects on public services, and a high consumption of ecologically sensitive land. Managed growth is the most cost efficient (Burchell & Mukherji, 2003). Through the study of alternative models of development, considering housing types, location, occupancy rate, and densities of urban sprawl and managed growth compared with land conversion (Duncan J., 1989; Burchell, Dolphin, & Galley, 2000; Burchell, Lowenstein, & Dolphin, 2000), can provide insight into the merits and demerits of development.

Built environment form, quality, and utility directly interact with the natural environment and residents' social and economic wellbeing. The environmental effects due to urban developments, include the loss of green land wildlife habitat and landscape aesthetics, and an increase in impervious surface, and inferior air quality. The socioeconomic consequences include the study of inequality, affordability, income and employment, market effects, and public services (Edwards, 2000).

There are two fundamental concepts involved in the assessment process: one is assessment methodology and the second is a set of indicators to measure sustainability. These methods are then based on several indicators mainly revolving around economic, social, environment, and governance aspects (SEP, 2015; Adinyira, Seifah, & Kumi, 2007) such as theme-based indicators (Huang, Wu, & Yan, 2015). Methods can be based on qualitative, quantitative, or mixed designs, which are all important components of socioeconomic impact assessment (Tamborra, 2002). Quantitative indicators can be based on secondary sources of national and municipal data, whereas special statistical or scientific surveys can be adopted for primary data collection (Seasons, 2002). Indicators based on perceptions, feelings, and values call for close attention. Such qualitative sources can be based on semi-structured surveys, case studies, interviews, and focus groups. In urban assessments, the common data sources are secondary rather than primary (Seasons, 2002).

Urban sprawl is one of the major aspects of urban sustainability and requires multi-dimensional (Oueslati, Alvanides, & Garrod, 2015) assessment by using spatial scale, population density, and scattered urbanisation (Chin, 2002).

From the literature, we can determine two aspects of urban development and financialization: one encourages financialization and the other, the consequences on the urban environment (Theurillat & Crevoisier, 2014). The financial needs of urban development, operations and governance, along with individual consumer behavior, attract profit-seeking investors. The involvement of financial institutions and big individual investors in the real estate market for higher (Theurillat et al. 2010) and lucrative returns encourages market speculation, with an increased financial risk to consumers (Rutland, 2010; Aalbers, 2008). Profit-seeking motivation

further defines market and land development practices to facilitate investments rather than meet the needs of housing. Market speculations increase land and housing prices and result in increased inequality and affordability issues (Edwards, 2000). In addition to social issues, land development (i.e., converting agricultural land into inefficient paved impervious surface), with its inability to meet the fundamental needs of housing, negatively affects the environment. Keeping in view the profit-seeking motivation in urban land development and its social, economic, and environmental consequences, financialization of urban land development has negative effects on overall urban sustainability.

Financial constraints, lack of knowledge and poor planning affect the efficiency of developing countries and sustainability of urban developments. Infrastructure investments by both public and private financing need better and coordinated plans to achieve integrated growth and improved efficiency of development (Alm, 2015; Mahadevia, 2006). Thus, it is significant to assess the impacts of the current decisions and selections being made and the level of coordination between public and private spending in terms of delivering socioeconomic benefits. Socioeconomic impact assessment of current practices will pave the way to formulating a decision-making framework, the development of an input/output model, and a multi-criteria evaluation for urban development financing (Smart & Lee, 2003; Black, Brown, Diaz, Gibler, & Grissom, 2003; Chau, 2014).

The literature shows that urban structures and growth patterns of developing countries, in particular, play important roles in human wellbeing and livelihood. The cumulative impact of growth on the local environment, social structure, and economic activities threatens overall sustainability of the region (Brueckner J. , 2000; Freeman L. , 2001; Kahn, 2000; Oxley, 2004). Instability of financial growth leading to economic and social crises due to financial speculation creates problems of inflation, affordability, household debt, income distribution, and increased inequality (Palley, 2007; Beck, Degryseb, & Kneer, 2014).

2.3.6 Conceptual framework

The conceptual framework derives from the empirical evidence from both the scholarly and grey literature while taking into consideration the less emphasised or ignored aspects of integration.

Considering the objective of this study and its unique local conditions, a theme-based framework was opted to study sustainability of urban development. The thesis explores the relationship between financialization, urban development practices and sustainability resultant of urban sprawl. Low-density urban sprawl has proven environmental, social, and economic impacts due to loss of green land, increased cost of living, inequality, and other related social and environmental consequences. In the local context, low-density urban residential development was studied in terms of occupancy rate and utilization of developed land for housing purposes and its relationship with market motivation in terms of financialization of urban land development practices. Walkable communities are more sustainable and environmentally-friendly, including being a positive impact on economic and social aspects. For this study, walkability of selected communities was studied in relation to occupancy trend to assess sustainability of local practices.

In the specific context of this study and its objectives to find the forces that drive land development and their impact on urban sustainability, market motivations and efficiency of land development were studied. The market motivation was studied by assessing individuals' motivations in real estate investment, whereas sustainability of urban land was reached by assessing its utility and efficiency. The utility of land development was assessed by analyzing the rate of housing construction on developed land as its primary objective, whereas the Walk Score indicator was used to assess efficiency of developed land in terms of provision of basic amenities residential neighbourhoods and its relationship with the occupancy. The impact on the natural environment due to the urban built environment (particularly the conversion of agricultural land into a paved impervious surface), has been studied in the past (Edwards, 2000; Niazi & Khetran, 2007; Butt, Waqas, Iqbal, Muhammad, & Lodhi, 2012; MCC, 2015; Lorencova et al. 2013; Houghton & Goodale 2004). However, due to time and resource limitations, the natural environment impact assessment was excluded from this study. The built environment was evaluated in terms of built form and spatial distribution through the analysis of development bylaws and local practices. Transportation cost is one of the major contributors of total household expenditures; and walkable communities reduce reliance on vehicles. In this study, the Walk Score indicator was studied to determine the availability of amenities in close proximity

and its relationship with occupancy growth rate. Whereas some factors will be interchangeable, like availability of amenities, others have an impact on residential living costs as well as social consequences. Similarly, low density urban development increases cost of public services and inefficiency in terms of higher infrastructure cost per capita, affecting the ability of municipalities to finance quality municipal services (Carruthers & Ulfarsson, 2008; Carruthers J. L., 2002; Hortas-Rico & Sole-Olle, 2010). Inability to generate revenue also has both economic as well as social consequences (Alm, 2015) with respect to quality, liveability, and additional cost of services (Carruthers, 2002). Low density developments increase the cost of public services (Hortas-Rico & Sole-Olle, 2010); and in this study, the occupancy trend of urban land developed for the purpose of residential construction helps in determining the sustainability of the development practices operational cost generally associated with community density.

Based on previous analyses, a conceptual framework (see Figure 1) was developed to summarize the integration of urban development and operational aspects and their interrelationship. The conceptual framework is based on urban governance efficiency, economic, and social performance, and urban growth pattern under the influence of market forces and motivations shaping urban form. The urban land development pattern, the result of local regulations under the influence of market forces and motivations, may affect community sustainability in terms of the consequences associated with low density urban sprawl and ineffective use of developed land.

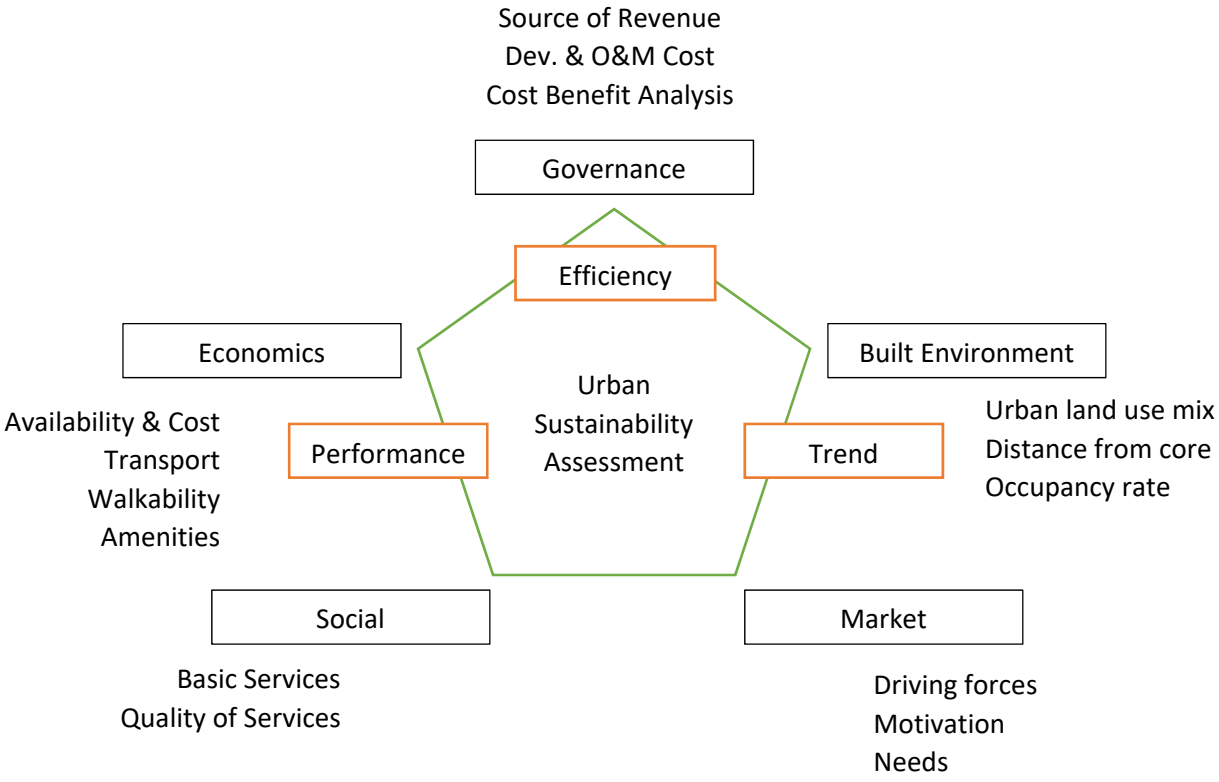

Figure 1: Conceptual Framework Diagram-General

The conceptual framework diagram specific to this study is shown in Figure 2. As per the unique local method of site and service model of land and housing development, individual land owner decisions make a real impact on the development pattern. The market motivations and driving forces were studied in terms of individual preferences, motivations, and mode of financing for construction, relative to real estate investment preferences and holding property time period before actual construction of the house. Concurrently, market current development practices were studied with respect to development practices, residential land occupation, construction of houses, and walkability of the sample communities. Detailed analyses and interrelationship are described in the coming sections.

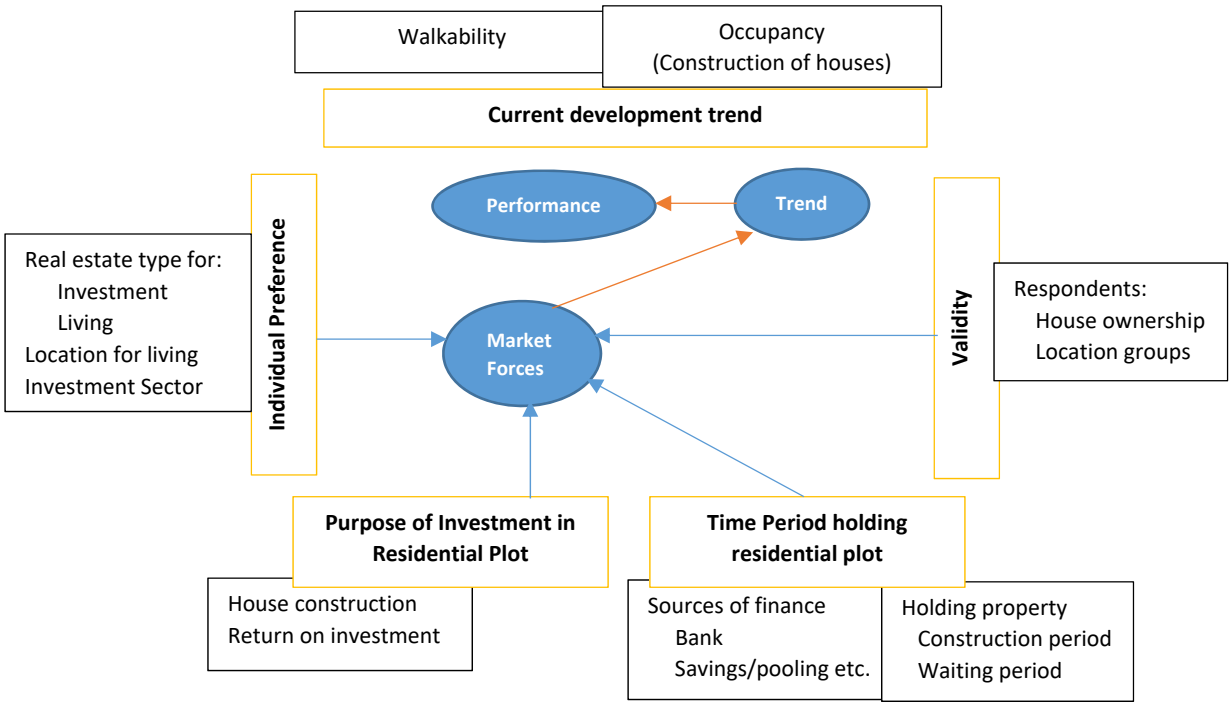

Figure 2: Conceptual Framework Diagram-Specific

Section 3 - Methods

3.1 Introduction - Research approach

The fundamental approach of the present study is inductive with an objective to learn from existing practices through the analysis of a case study. The study uses a mixed-method approach that leans more towards quantitative data collection and qualitative analysis. This work does not consider any existing theory to be tested or analysed due to the local unique context and lack of associated research, although it does generate a proposition based on a unique combination of factors of the subject under investigation and will lead to theory generation (Creswell, 2014).

The study is primarily based on a working model of entities and the interaction among them within an urban planning context, hence tends to be ontological. The study involves the evaluation of real time practice within the specific context of a case study. The work combines multiple dimensions of urban analysis with an objective to finding sustainable solutions and mitigating consequences of current practices. Through this approach, the study is a blend of constructivism and pragmatism (Creswell, 2014).

A mixed-method approach was used in conducting this study through a survey collection of quantitative primary and secondary data. Qualitative data through observations, site visits, and news articles were collected in a convergent parallel format to verify certain results. Data from all sources were analysed qualitatively to develop the proposition (Chalmers, 2013).

3.2 Assessment procedure

This section provides the assessment procedure and methodology adopted to meet the objectives as discussed in Chapter 2. The assessment procedure is further categorized into two main categorizes: to assess the development practices with reference to financialization; to assess current practices in terms of urban sustainability with respect to urban sprawl.

3.2.1 Development as a function of financialization

As per current practices in the study area, land is developed privately and sold to individual owners to construct houses themselves as and when required. Therefore, it was necessary to understand were the people`s intentions when investing in the property and real estate market. The element of financialization in current land development practices and market trend is primarily based on the market and investors` intentions for using a property purely as a commodity rather than for social and housing needs. To determine the element of financialization, data was collected through a survey to know public motivation for buying the land, the holding period before constructing the house, priority sources of capital to fund construction costs, and the priorities in general for investment purposes. Data collected through the survey related to public opinion was then compared to occupancy (i.e., since the occupants established themselves in the selected communities).

The first objective of this study is to determine whether investment in a property is primarily undertaken with the objective in mind to construct a house, or for investment purposes only. In addition to this relationship of property investment and home ownership status, business preferences and financial requirements in the construction a house were tested to determine all possible factors that may influence property investment decision. Holding developed land without constructing a house on it is also an important factor in terms of its utility. The relationship of time period of holding land and housing capital finance is studied. The specific questions asked in this regard is discussed in the coming sections.

3.2.2 Development practices and sustainability

Low density scattered housing developments result in urban sprawl and loss of valuable agricultural land. The impact of such developments on overall environmental sustainability is discussed in detail in Chapter 2. The first question asked determines whether holding development land is for the time required to construct the house or not. The time period for holding property was tested against the average time required to construct the house. In addition, an assessment of current development practices was made by gauging public opinion about the preferred type of housing for living purposes; the period of keeping unutilized land; public preference while choosing the location in which to live, such as provision of basic

infrastructure, distance from city center, workplace and school, land/house prices, and natural landscape. The occupancy trend regarding period of establishment and walkability of the communities was assessed to determine sustainability. The specific survey questions asked under this heading along with the data collection methods are discussed in the next section.

3.2.3 Hypotheses development

The hypotheses were developed as per the objectives of the present study to determine the element of financialization and overall sustainability within current development practices.

3.2.3.1 Development as a function of financialization

The main hypotheses of this study is based on the first research question: H1-Current land development practices are irrespective of financialization. To determine this, the hypotheses was further sub divided into the following sub hypotheses.

- Purpose of Investment in property
    - pH1a-The Purpose of investment is independent of the purpose of return on investment and the construction of the house.
    - H1b-The purpose of investment is independent of home ownership status and location of respondents.
- H1c-Property investment is a function of business preferences
- H1d-Holding unutilized property is a function of capital finance sources to build the house.
- H1e-Holding property is a function of business preferences.
- H1f-Property and development practices are independent of home ownership status.

3.2.3.2 Development practices and sustainability

The second hypothesis is based on the second part of the research question: H2-Urban land development practices are sustainable in the city of Islamabad with respect to walkability. Sustainability of urban development practices was assessed through the developing following sub hypotheses.

- H2a-Holding property is the function of time required to build the house
- H2b-Urban development pattern is independent of individual preferences.

- H2c-Property and development motivations are not similar across the country
- H2d-Location preference is independent of home ownership status, type of house and commercial interests such as purpose, holding period and business interests.

3.3 Data collection

3.3.1 Residential housing developments – Sampling & data collection

Primarily all subdivisions are site- and service-based (Niazi & Khetran, 2007), either by public or private developers and managed by CDA, with the exception of the Defence Housing Authority (DHA Housing), and Bahria Town privately-led development and management. Currently 53% of Zone 5 capital territory is being developed (Butt, Waqas, Iqbal, Muhammad, & Lodhi, 2012; CDA-Housing, 2016), hence the sample was selected from Zone 5. The majority of the developments are being developed and operated by private companies or semi-government bodies such as the DHA which operates privately without any assistance from the CDA. Therefore, selection was made from developments developed and operated by private entities. The final selection was made on the current built-up area to evaluate occupancy trend in both thinly and thickly populated residential communities.

Data collection was a challenging task due to poor data management practices, lack of transparency, and non-cooperative response from the organizations concerned. All land transfer and housing permit records are maintained by individual developers and operating entities. No such records were available from CDA authorities. Islamabad Electric Supply Company (IESCO) maintains residential electric connection records on entirely different subdivisions of the city, so specific yearly house connections for each residential community were not available. Due to unavailability of yearly growth of housing construction, the individual area studied was based on maximum possible data available from the offices concerned and re-verified by using Google Earth historic images.

The assessment of occupancy trend was then restricted to the total number of houses built to date, and the period was calculated from the date a particular development (“society” in local terms) was ready for individual housing construction. Key dates, such as launch date of development and availability of basic infrastructure to enable construction of houses by the

individual land allotters, were obtained from the developers' offices. Information regarding size, land use pattern, and total number of plots available in each development was obtained from the respective company offices. The total number of houses constructed in each community was obtained from the respective developer's office and verified using Google Earth images by counting built houses in each community's current image.

To assess and compare (Chiu, Shah, & Maclagan, 2015) overall walkability (Lo, 2009) of each community under investigation, Walk Score, a web-based walkability assessment tool, was used. Walk Score is considered a valid measure for estimating neighborhood walkability in multiple geographic locations (Weinberger & Sweet, 2012) and used by planners to monitor changes for planning and development purposes (Duncan, et al., 2011; Nykiforuk, McGetrick, Crick, & Johnson, 2016). Walk Score measures attributes of the built environment, including fundamental amenities such as schools, shopping, entertainment, grocery stores, banks, etc. (Duncan, et al., 2011; Moudon, et al., 2006). Mean Walk Score (Weinberger & Sweet, 2012; Duncan, et al., 2011; Nykiforuk, et al., 2016) for each community was calculated by using multiple locations in each community development.

3.3.2 Survey structure & design

The Survey was initiated based on the following framework and incorporates the fundamental concepts discussed above. Survey questions structure and associated questions are shown in Table 1.

Table 1: Survey structure

Categorization of Participants	Development as a Function of Financialization	Development and Sustainability
Status of home ownership	Purpose of investment	Preferred form (type) of house
Q: Do you own house in Pakistan?	Q: What is your current purpose/intension for real estate investment?	Q: What form of house you prefer for living?
	Time period of holding property	Time period
	Q: Any plot you purchase or purchased, how long it will take or took to construct the house or sold ahead?	Q: Any plot you purchase or purchased, how long it will take or took to construct the house or sold ahead?
	Source of finance	Location Preference
	Q: How do you prefer to finance your construction of house?	How will you choose locality for your own living purpose?
	Preferred sector for investment	Rate: Provision of infrastructure
	Q: What is the best sector for investment or saving purpose?	Rate: Distance from City Center
		Distance from workplace
		Distance from School
		Land/house price
		Natural setting/landscape

The survey is comprised of closed ended multiple choice questions beginning with house and property ownership and purpose of investment, and followed by usual investment time period. The next set of questions investigate the type of properties in which people prefer to live such as a freehold property, multi-family apartments, and investment properties such as land, constructed houses, shops, or apartments. In the financing section, the question was aimed at understanding the general preference for financing the construction of a house. Respondents were given the option to choose from local common practices, such as using one's own savings, a common pool, friends or family, or from banking sources. Using land purely as a trading commodity, the public's generally preferred choice of investment, was also investigated. The last section of the survey is for the purpose of assessing the respondent's preference for choosing the location of their residence. Each respondent was to rate his/her preference(s) from low to high regarding availability of infrastructure; distance from workplace, city center and school; landscape; and price.

Altogether, the survey consists of 11 questions designed to take less than five minutes to complete. These questions were shortlisted from the full version of 17 questions as per the limitations of the study. Questionnaire information letter is attached in Appendix A. Copy of the shortlisted survey questionnaire is attached in Appendix B and full version of questionnaire is attached in Appendix C.

3.3.3 Survey sample

The total population of Pakistan was 188 million (World Bank, 2015) and with 39% residing in urban areas. The age group of 15-65 years comprises of 60% the population. Our estimated target population residing in urban areas and who are between the age of 15 and 65 is 44 million (World Bank, 2015). In addition to age, target population was the likely buyers of the communities under investigation with respect to income bracket as explained in limitation section. The population based sample size is 368, an estimate based on a 95% confidence level, 5% error, and 50% response distribution using the following formula.

$$\frac{\frac{z^2 \times p(1-p)}{e^2}}{1+\left(\frac{z^2 \times p(1-p)}{e^2 N}\right)}$$ (SurveyMonkey, 2016; Raosoft, 2016)

Table 2: Respondent groups

Group	# of Observations	
Total (All groups)	364	
Group 1	145	Random across country (Urban only)
Group 2	219	Islamabad/Rawalpindi (Urban only)

A total of 1500 forms were distributed by hand or emailed. A total of 364 acceptable responses were received with an overall response rate of 24%. 145 respondents were drawn randomly from across the country, using personal social media connections of former university/college fellows and former colleagues. The national level response rate was 21%. With a response rate of 27%, 219 were collected from within the city by distributing forms in educational institutes and

corporate organizations only 2% of the overall responses were rejected due to incomplete information and for not fulfilling survey criteria.

3.3.4 Survey dissemination

The survey, containing structured a questionnaire, was disseminated into two groups. One group was primarily from the city under investigation, and the second group was distributed among whole country-wide participants. The survey was distributed through the contact lists obtained from various organizations such as local universities, associations, etc. The second group consists of participants obtained through personal contact lists, colleagues, and class fellows. The survey instrument was circulated through email, Google forms, and printed hard copies. University alumni, colleagues, and various professional and corporate organizations were approached to participate in the survey.

Local participants were approached through printed hard copies circulated physically through organization administration staff and collected after completion. National level random participants were primarily approached through email with a Google link to the form, or pdf form attached to email. A cover letter highlighting the objective, purpose, and benefits of the survey along with a request for participation consent form was also attached. All participants were informed about confidentiality of their responses. No information collected would lead back to the identity of the respondents. Selected dissemination path ensured to approach middle income and potential buyers of the housing developments under investigation.

3.4 Statistical procedure & data analysis

This section introduces the variables used to measure each construct and hypotheses by using t-test, chi-square tests and correlation analysis. The existing literature and previous research on urban sustainable development were reviewed to identify relevant practices. Most of the literature found was focused on quality assessment of urban development only. Literature related to individual and market motivational assessment related to urban development practices was not available. Variables were identified through the literature on financialization of urban development and real estate practices around the globe. These factors were then compared to local common terms and practices by reviewing news articles, official reports and

discussion with experts. Therefore, the measures and practices for each construct were based on the literature, market practices and expert feedback. Sustainability measures related to urban occupancy, walkability and associated impacts are well documented in the literature. Investment motivation and individual decision making was also discussed in the literature but no relevant literature can be found regarding the relationship of decision-making, land development, and sustainability. Factors and construct related to the local decision-making process and market practices were developed by consulting local real estate experts and sample survey trial run. The trial survey was circulated among professionals from the real estate industry, development practitioners, and ordinary residents. Three individuals were selected from each profession and the survey questionnaire was discussed face to face. The final questionnaire was prepared based on individual feedback.

Statistical tests were conducted to analyze the data collected through survey for each variable. The distribution of data was analyzed to assess overall response trend. The T-test was used to test the individual construct against available data, while the association between variables and groups was assessed by using the Chi-square test.

3.4.1 Indicators and variables

Sustainability indicators used in this study for overall sustainability of residential developments included walkability, occupancy and density, and sprawl. Estimation of each indicator is discussed above in detail.

Variables used in the survey tool were: home ownership status, purpose of investment, holding property time period, preferred type of housing, sources of capital finance, preferred investment sector, and preferred location for residence. Each variable is discussed below in detail.

Current home ownership status

In terms of a person's behavior (Crotty, 1990; Flood & Garber, 1980) with regard to real estate and property investment, it was necessary to differentiate between people who own a house and people who do not own house. Home ownership status may change individual behavior

(Vasoo & Lee, 2001; Kemeny, 1992) when dealing with the property market. Respondents were grouped as per their current home ownership status.

Purpose of investment

The real estate development operates under the influence of organizational and individual actor's objectives and their behaviors (Squires & Heurkens, 2016; Thomas, 2017). Individual decisions and purpose of investment is one of the major forces defining the dynamics of real estate development (Healey, 1991). Four fundamental questions were asked to understand an individual's purpose of investment in real estate property.

a. to buy plot to construct house in future
b. to buy plot to earn profit
c. to buy plot/house for children
d. to keep money safe for future and avoid currency devaluation

The objective is to know what the intentions are of individuals in buying real estate property. For analysis purpose responses, were re arranged into two groups. Options "b, c, d" are merged into one category of purpose other than house construction whereas option "a" specifically represents for purpose of house construction only. Return on investment might be in terms of financial as well as social benefits (Biemann, et al., 2005; Weber O. , 2013), therefore purposes of investment other than construction of house are grouped as a purpose of return on investment. For this study, return on investment combines all three categories of investment motivations; earning profit, investment for children and avoiding devaluation as non-housing purpose. The merging of responses was opted for better understanding and to avoid confusion of possible multiple answers. This was established during trial run of the survey questionnaire.

Time Period:

Urban expansion is assessed over time and space (Oueslati, Alvanides, & Garrod, 2015). Three questions were asked to analyse time period. The time period denotes how long a property is held for either the construction of a house on the site or for selling ahead, or the waiting time before the developer provides physical possession of the land. As explained in the background

section, in site and service model house construction is the responsibility of individual owners; and holding property more than the time required to build the intended house affects the natural environment (e.g., unutilized land) while contributing to price speculation as well. These questions were:

- Any property you will purchase (or you purchased) for investment purpose, how long you will wait (or you wait) to sell the property? ***(longest total period in one case)***
- Any plot you will purchase (or you purchased), how long it will take (or took) to construct the house? ***(Longest period from purchase of plot to ready house)***
- Any plot you purchased (or planning to purchase), how long developer will take / took to provide possession? ***(Longest period only)***

Time period to choose for all of the above questions option was same as below

1-2 years

3-5 years

5-10 years

11+ years

The responses from the above three questions were merged and grouped period-wise, using the respondents' longest period replied for each question. From these three questions, the objective was to find the property holding time period for any of the reasons for selling ahead, constructing the house, or the time taken by the developer to provide physical possession.

Property type and location preferences

To know the public preferences (Breheny, 1997; Gordon & Richardson, 1997) for the type of property they choose to live in, the options given were to choose between an independent single-family dwelling and a multifamily medium- and high-rise building. Responses were further grouped into two basic categories of single family and multifamily accommodation preferences by grouping medium- and high-rise choices into one group. For location preference, a set of

questions were asked to rate location features such as: availability of infrastructure; distance from school, workplace and city center; land/house price; and natural landscape of the locality.

Source of financing & Investment Sector

To establish what (Leyshon & Thrift, 2007) people use as sources of finance to construct a house, the options given to choose from: self-savings, crowd/common pool, loan support from family and friends, and banking sources. Similar to the above described variables, this was also regrouped into two fundamental groups of funding sources through banking and non-banking channels.

Investment sector preferences were also regrouped into real estate and non-real estate sectors to assess the public motivation towards using property for business purposes.

3.5 Limitations and boundaries

The present study is limited to the assessment of financialization in real estate practices and its impact on sustainability of privately developed residential communities. The objective of this study is to understand the relationship between real estate market forces and urban land development. Assessment was based on understanding the customary practices and objectives of people when buying residential land. Sustainability assessment of land developed by the private sector was limited to occupancy growth rate, time period of establishment, density potential of urban form, and walkability of sample communities. Other environmental and social factors were excluded from this study.

The study is limited to the following factors:

- Urban Growth – Sample from subdivision population
    - Establishment
    - Occupancy rate
- Urban Form – Sample from subdivision population
    - Mix of urban form
- Walkability – Sample from subdivision population
- Market and Individual motivations

Survey was conducted to understand motivations of individuals while investing in real estate sector. The sample population was the likely buyers of the communities investigated in this study. The most of residential communities operating with in legal terms are serving middle income salaried and business individuals. General public, with no secure source of income, usually go for illegal and informal housing developments, therefore excluded from the study. In addition to that very high-income individuals owning big business and individuals with real estate sector as their primary profession, were also excluded from this study.

3.6 Reliability and validity

For quality research reliability of the data collection, process repeatability was necessary. To ensure reliability, the research methodology was documented in detail, including concept development, selection of tools, data collection methods, coding and analysis (Yin, 2014). The methodology and case study protocol were also reviewed by the thesis committee.

In this research construct, validity is ensured by identifying the most appropriate measures of study from the literature review, industry practices, and primary and secondary data sources (Yin, 2014). Multiple sources and techniques helped maintain consistency through convergence where possible (Yin, 2014). Content validity was ensured through the literature review, testing of questionnaires (Jackson, 1988), and reviews by academic and professional experts (Karros, 1997).

To establish validity of research, particularly for such a case study, multiple sources of data were used. Data were collected using secondary and primary sources of historical data, questionnaires, participant groupings, and analysis (Yin, 2014). Historical data were collected and verified through several sources, including departmental data, physical observation, published data, and online tools (Creswell, 2014).

In generalizing a case study's findings, external validity is always a concern (Flyvbjerg, 2006). Due to the case study's unique set of conditions, data validity was ensured by grouping respondents from both city and national levels. Categorization and comparative analysis of respondents ensured external validity for the country under investigation.

Section 4 - Results

4.1 Introduction

This section provides an overview of the results from the quantitative and qualitative data collected through primary and secondary sources. In addition to the results obtained through statistical analysis as well as qualitative analysis, the outcome of our stated hypotheses and constructs is discussed here in Chapter 3.

Data collected were collected using the survey tool, secondary sources, site visits and observation, and through online tools such as Google Earth and Walk Score.

Data presented in this section is organized as follows:

- Introduction about the study area and sample housing developments
- Current development practices and trend
- Current development as a function of financialization
- Current development practices and sustainability

4.2 Introduction of the study area and sample housing developments

4.2.1 Study area

Pakistan is located in South Asia on the crossroads of Central and Western Asia. Pakistan with a population of 188 million (World Bank, 2015) is the sixth most populous country in the world and the 36th largest in terms of area. The City of Islamabad, the Capital of Pakistan, is located in the northeast part of the country. The estimated population of the city is more than two million, while the larger Islamabad Rawalpindi metropolitan area exceeds five million in population. Being the capital of the country and the third largest population concentration in the locality, Islamabad has its own strategic and economic value.

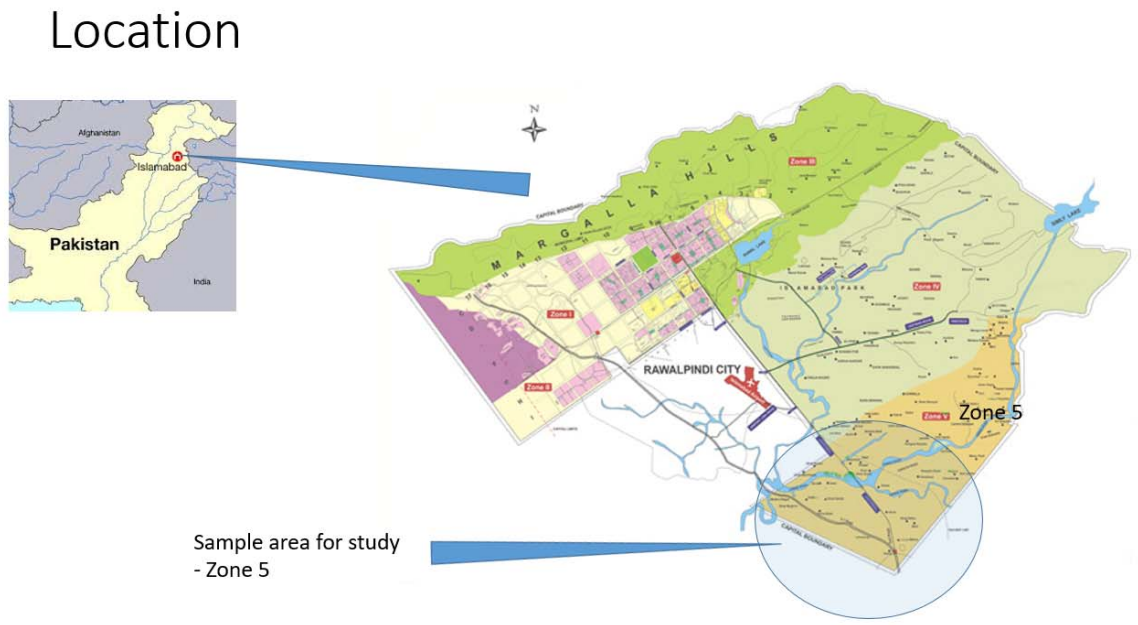

Figure 3: Study area location – Source CDA Islamabad (CDA, 2016)

4.2.2 Sample housing developments

The city of Islamabad is administratively divided into five major zones. As shown in Table 3, currently a total of 51 (CDA-Housing, 2016) residential development projects are being run by the private and semi government sector. Out of these 51 communities, 31 communities are in Zone 5. In this way 80% of residential projects are in Zone 5 only.

Table 3: Study area subdivision

Area subdivision				
	Area (Kanal)	**Area (Acre)**	**Area %age**	**Comments**
Total Area all city zones (1 to 5)	1,799,781	224,973	100%	including Safari Valley
Total Area Zone 5	320,017	40,002	18%	including Safari Valley
Total Area of 51 developments	232,331	29,041	13%	of total city area
Area of 31 Developments			80%	of all 51 developments
Area of 31 Developments	186,159	23,270	60%	of Zone 5
Area of 11 Developments (sample)	61944	7743	35%	of Zone 5 developments (31)
Total Developments in all zones (1 to 5)		51		
Total Developments in Zone 5		31	60%	of all Zones
Total Developments for sample		11	35%	of Zone 5

Out of these 31 communities, 11 communities were selected within a 100-square kilometers area for this study. Communities were selected based on density determined by physical observation and be in close proximity. The details of each community are discussed in the next section. The location of these residential communities is marked in Figure 4.

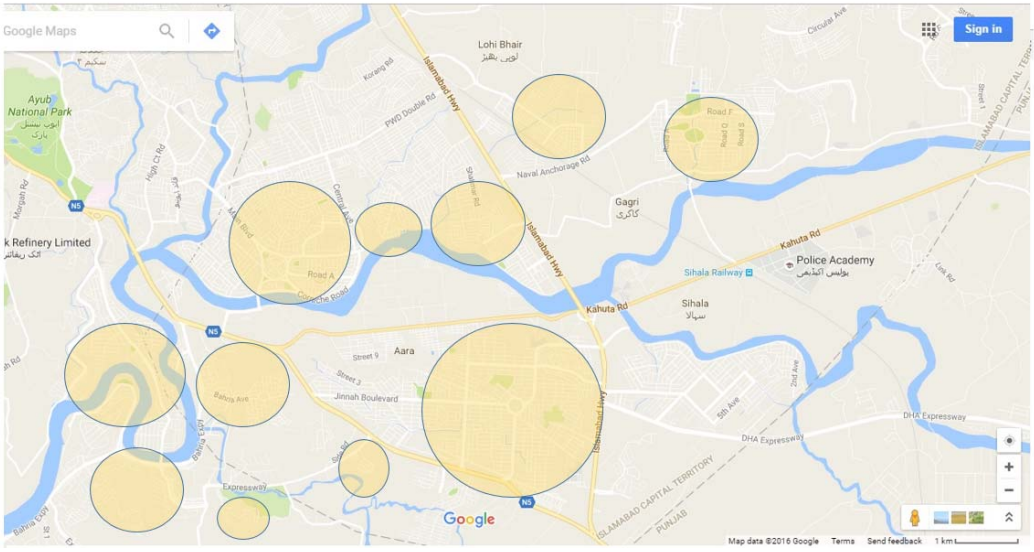

Figure 4: Sample housing developments – location map

4.2.3 Measuring occupancy trend

The sample housing societies were studied and basic data were collected related to land area, year infrastructure ready for construction of houses, and number of houses constructed up until March 2016. Data were collected from the sample of 11 private sector housing developments in Zone 5 in which 60% of the city developments are taking place. The sample represents 35% of the area under development in Zone 5 of capital territory of Islamabad. The primary data collected are shown in Table 4, and within this sample, three communities have less than a 20% occupancy rate, five communities with occupancy between 20% and 30%, and three communities with more than 50% occupancy. Only one community was established in 2014, whereas all the others were established prior to 2007. The data show average occupancy of 30% in 10.64 years, and an average simple straight annual growth rate of 2.6%.

Table 4: Housing development occupancy data

Islamabad residential housing developments (Sample)

	Name of the Housing Development	Area (Acres)	Number of Plots	House Count	Occupancy (% of housed constr.)	Period (Years)	Growth Rate	Average Walk Score
1	Bahria Garden City	374	680	12	1.8%	2	0.9%	1
2	Bahria Phase 7	216	1577	335	21.2%	9	2.4%	16
3	CBR Town	245	2056	418	20.3%	9	2.3%	42
4	Jinnah Garden, Phase-I	319	2700	615	22.8%	9	2.5%	9
5	Zaraj Housing	200	1472	201	13.7%	11	1.2%	12
6	Naval Anchorage	460	2888	413	14.3%	12	1.2%	21
7	DHA 2	2,239	16942	3717	21.9%	12	1.8%	23
8	Bahria Safari Valley Area	973	12005	3949	32.9%	10	3.3%	31
9	Bahria phase 2 to 6	970	6915	3947	57.1%	13	4.4%	54
10	Soan Gardens	373	3100	2022	65.2%	14	4.7%	40
11	DHA 1	1,375	3949	2417	61.2%	16	3.8%	28
	Average				30.2%	10.64	2.6%	

4.2.4 Walk Score

As discussed in Chapter 2, the average Walk Score was calculated for each community by using the online web tool walkscore.com. As per the scoring system of walkscore.com, communities with a Walk Score above 70 are “very walkable”, whereas a walk score between 50 and 69 are “somewhat walkable” but not entirely walking-friendly. A Walk Score of less than 50 denotes car dependency. The respective Walk Score for each community is presented in Table 4. The summary statistics are presented in Table 5. Occupancy mean was 30.2% in the mean period of 10.63 years and 25.18 represents the Walk Score for the selected sample communities. It shows that most of the residential communities do not have basic amenities within walking distance and, as a result, are mostly vehicle-dependent.

Table 5: Housing developments summary statistics

Variable	Label	Mean	Std Dev	Minimum	Maximum	N
Acres__Area_	Acres (Area)	703.8181818	638.7413903	200.0000000	2239.00	11
Plots	Plots	4934.89	5111.37	680.0000000	16942.00	11
house_Count	house Count	1640.55	1618.36	12.0000000	3949.00	11
Occupancy	Occupancy	0.3021978	0.2133983	0.0176471	0.6522581	11
Period	Period	10.6363636	3.6406793	2.0000000	16.0000000	11
Growth_Rate	Growth Rate	0.0258714	0.0130286	0.0088235	0.0465899	11
Walkscore	Walkscore	25.1818182	15.8165621	1.0000000	54.0000000	11

Occupancy growth rate has a direct impact on overall sustainability of the residential communities in terms of environment impact due to urban sprawl and social implications due to travel time, walkability, provision of amenities, and generation of revenues for the communities’ operation and maintenance. To assess the relationship between the variables, a correlation analysis was conducted. The analysis was based on two aspects: the relationship between the size of the development and community occupancy growth and Walk Score; and the relationship between occupancy growth, period and Walk Score. Separate tests were conducted considering Walk Score and occupancy as dependent variables.

Community size has a p value of 0.5294, greater than the significance level of 0.05; therefore, correlations are not significant. The occupancy growth rate has a significant correlation with the time period and Walk Score with p-values of 0.0391 and 0.0081, respectively. The occupancy

growth rate has a positive and high correlation with the time period (0.62662) and Walk Score (0.74823). The respective values are presented in Table 6. We can conclude that, although size of the community matters, it has very little impact on occupancy growth rate and walkability, whereas walkability is directly impacted by occupancy growth rate and time period. Although availability of basic amenities like schools, shopping and recreational facilities increase with the increase in residential community occupancy, holding developed land unoccupied for longer periods causes delay in provision of basic amenities.

Table 6: Pearson correlation coefficients

Pearson Correlation Coefficients, N = 11 Prob > |r| under H0: Rho=0	
	Walkscore
Acres__Area_ Acres (Area)	0.21305 0.5294
Period Period	0.58824 0.0570
Growth_Rate Growth Rate	0.74823 0.0081
Occupancy Occupancy	0.71796 0.0128

Pearson Correlation Coefficients, N = 11 Prob > |r| under H0: Rho=0	
	Growth_Rate
Acres__Area_ Acres (Area)	0.18200 0.5922
Period Period	0.62662 0.0391
Occupancy Occupancy	0.95750 <.0001
Walkscore Walkscore	0.74823 0.0081

4.3 Statistical results survey

This section presents statistical results based on theoretical reasoning and supporting literature as presented in Chapter 3. Statistical results are further categorized to the assess element of financialization and influence on sustainability. This section is primarily based on analysis of data collected through survey. Statistical analysis of data is analyzed starting with descriptive analysis followed by classification analysis by determining level of differences, level of association and hypotheses testing. To achieve the objective of this study this section is organized as follows;

- Descriptive analysis
- Sample Group Analysis
- Development as a function of financialization
- Development as a function of unsustainable practices

4.3.1 Descriptive analysis

4.3.1.1 Summary statistics

The summary statistics are presented in Table 7. The mean and standard deviation values are present for all variables. The time period of holding property mean value is 2.59 with a standard deviation of 0.895. The time period mean value of 2.59 years falls within the time frame of 6 to 10 years (i.e., holding property before the next transaction of either selling the property or constructing the house). Variables mean values are further analyzed with data distribution present in the next section.

Table 7: Summary statistics

Variable	Label	Mean	Std Dev	Minimum	Maximum	N
VAR2	1- House ownership (Y/N)	1.3461538	0.4763978	1.0000000	2.0000000	364
_2__Purpose_of_real_estate_inves	2- Purpose of real estate investment	1.6813187	0.4666065	1.0000000	2.0000000	364
_3__Time_Period__holding_propert	3- Time Period (holding property)	2.5950920	0.8953764	1.0000000	4.0000000	326
_4__Preferred_form_for_living	4- Preferred form for living	1.1758242	0.3811945	1.0000000	2.0000000	364
_5__Financing_Mode	5- Financing Mode	1.1565934	0.3639172	1.0000000	2.0000000	364
_6__Investment_Sector	6- Investment Sector	1.4258242	0.4951480	1.0000000	2.0000000	364
_7__Facilities_Infra_Preferrence	7- Facilities Infra_Preferrence_such as roads,	1.3214286	0.5285065	1.0000000	3.0000000	364
_3__Distance_from_school_Preferr	water, sewerage etc	1.8736264	0.7006231	1.0000000	3.0000000	364
_9__Distance_from_your_work_plac	3- Distance from school_Preferrence	1.8379121	0.6585668	1.0000000	3.0000000	364
_10__Distance_from_city_center_P	9- Distance from your work place_Preferrence	1.9038462	0.7034637	1.0000000	3.0000000	364
_11__Land_house_price_Preference	10- Distance from city center_Preference	1.8324176	0.6859019	1.0000000	3.0000000	364
_12__Natural_landscape_Preferenc	11- Land/house price_Preference	1.7087912	0.6945912	1.0000000	3.0000000	364
	12- Natural landscape_Preference					

4.3.1.2 Distribution analysis

The variables data distribution is presented in Table 8. The home/house ownership mean value of 1.346 with 65.38% of respondents having ownership compared to 34.62% in rental accommodations. The Pakistan Urban home ownership average was 73.67% with a yearly decline of 2%, according to the survey conducted by Pakistan Bureau of Statistics in 2014. The estimated average home ownership in the urban population in 2016 could be 69% with 2% a decline, becoming quite close to the 65% of ownership found in this study.

Table 8: Survey: Distribution analysis summary 1

Survey: Distribution Analysis Summary 1				
Q/Code	Variables			Distribution
1-	House ownership			Normal
Code=1	Yes	238	**65.38%**	
Code=2	No	126	34.62%	
2-	Purpose of real estate investment			Normal
Code=1	House construction	116	31.87%	
Code=2	Profit/for children/saving	248	**68.13%**	
3-	Time Period for (House Construction /Possession/waiting)		326	Normal
Code=1	1-2 Years	42	12.88%	
Code=2	3-5 Years	97	29.75%	
Code=3	6-10 Years	138	**42.33%**	
Code=4	11+ Years	49	15.03%	
	Not Applicable	38	Excluded	
4-	Preferred form of property for living			Normal
Code=1	Independent House	300	**82.42%**	
Code=2	Apartment in Low/high rise	64	17.58%	
5-	Financing mode for construction of house			Normal
Code=1	Self-saving / crowd funding / family loan etc)	307	**84.34%**	
Code=2	Bank	57	15.66%	
6-	Preferred Investment sector			Normal
Code=1	Real estate	209	**57.42%**	
Code=2	Saving deposit/stock market/business	155	42.58%	

Making a real estate investment, as shown in Table 8, was categorized with respondents' intention of buying property for the purpose of house construction, or for profit and future savings. 68.13% of respondents' intensions were not for the purpose of house construction compared to only 31.87% to construct the house. The time period for holding the property for any of the reasons of house construction, taking over possession or selling ahead, the highest percentage of 42.33% was land holding for 6 to 10 years. Collectively, more than 57% held the property for more than 6 years. 82% of respondents gave preference to single family independent dwellings (homes) over multifamily high-density apartment units. 84% of respondents used non-banking channels to finance their house construction costs. Respondents showed more interest (57%) in the real estate sector for investment purposes as compared to 43% preferring other sectors. The last part of the survey questionnaire was to learn how people rate different variables while choosing the location in which to live. The site selection variables

such as provision of infrastructure, distance from school, workplace and city center, land/house prices, and natural landscape were rated from high to medium while choosing the location. The distribution data is presented in Table 9. Infrastructure provisions, such as roads, water, sewage, etc. were the highest priority of the majority (70.88%) of the respondents, whereas all other variables, including distance from school, workplace and city center, were kept to a medium priority by 50% of the respondents.

Table 9: Survey: Distribution analysis summary

Survey: Distribution Analysis 2							
How will you choose locality for your own living purpose? Rate your preferences.		1 – High		2 – Medium		3 - Low	
		Freq.	Percent	Freq.	Percent	Freq.	Percent
7	Infra: Roads/Water Sewage etc.	258	70.88 %	95	26.10 %	11	3.02 %
8	Distance from School	115	31.59 %	180	49.45 %	69	18.96 %
9	Distance from Workplace	113	31.04 %	197	54.12 %	54	14.84 %
10	Distance from City Center	109	29.95 %	181	49.73 %	74	20.33 %
11	Land/house Prices	121	33.24 %	183	50.27 %	60	16.48 %
12	Natural landscape	156	42.86 %	158	43.41 %	50	13.74 %

4.3.2 Sample groups analysis

4.3.2.1 GroupWise (Two groups)

Real estate and development practices, from a consumer's point of view, are similar across the country (H2c). To prove this, data were analyzed by the group of respondents from the city case study and selected randomly from the entire country. The number of respondents in each group is presented in Table 10.

Table 10: Influence of groups on variables

Influence of Groups on variables							
Variables	F	Method	T- value	P	G1 Mean	G2 Mean	Conclusion
					Mean	Mean	
Ownership Status	1.15	Pooled	1.85	0.0655	1.289	1.383	Not Significantly different
Purpose	1.04	Pooled	-0.41	0.6817	1.669	1.689	Not Significantly different
Time Period	1.21	Pooled	0.66	0.5096	2.6343	2.5677	Not Significantly different
F/Preference	3.22	Satter.	-5.31	<.0001	1.0621	1.2511	Significantly different
Financing	1.26	Pooled	-1.09	0.2762	1.13	1.17	Not Significantly different
Investment Preference	1.03	Pooled	-1.03	0.3056	1.39	1.44	Not Significantly different

The two-sample t-test was conducted for two groups of respondents that were selected randomly from across the country (Group 1); and respondents from the city of Islamabad only (Group 2) were selected to assess sample consistency. The plot shows data are somewhat symmetric. There is no significant difference between respondents from Group 1 and 2 in all variables except in preferred type of house. From the results, we can conclude that real estate and development practices from the consumer point of view is similar across the country except in preference over types of houses people choose to live in.

The Chi-square test was conducted to determine the association between the two groups regarding their differences in preferences for choosing one housing type over another. The p-value was <0.0001; therefore, the association is statistically significant. To determine the association row percentages were taken. Group 1, the randomly selected participants from across the country, were more likely to be in preference 1 (independent house) with 93.79% compared to the 74.89% of Group 2 (participants selected from the city). Group 2were more likely to choose option 2 (multifamily apartment buildings) with 25.11% compared to Group 1 with 6.21% preference for multifamily apartment dwellings. Due to the p-value of <0.0001 being significantly less than alpha 0.05, at least one proportion is not equal to other. Group 2 showed a higher percentage (85.94%) for multifamily apartment buildings than Group 1 (45.33 % voted for independent house). This indicates that the results are consistent among the participants from both sources except their preference over type of housing.

Table 11: Chi-square test-groups & preferred form for living

Statistics for Table of Group by _4__Preferred_form_for_living

Statistic	DF	Value	Prob
Chi-Square	1	21.5213	<.0001
Likelihood Ratio Chi-Square	1	24.2103	<.0001
Continuity Adj. Chi-Square	1	20.2364	<.0001
Mantel-Haenszel Chi-Square	1	21.4622	<.0001
Phi Coefficient		0.2432	
Contingency Coefficient		0.2363	
Cramer's V		0.2432	

Frequency
Percent
Row Pct
Col Pct

Table of Group by _4__Preferred_form_for_living

Group(Group)	_4__Preferred_form_for_living(4- Preferred form for living) 1	2	Total
1	136 37.36 93.79 45.33	9 2.47 6.21 14.06	145 39.84
2	164 45.05 74.89 54.67	55 15.11 25.11 85.94	219 60.16
Total	300 82.42	64 17.58	364 100.00

4.3.2.2 House owners & non-owners group

Housing ownership influences consumer behavior (Vasoo & Lee, 2001). The influence of house ownership status was assessed for the purposes of investment, holding time period of the property, type of property preferred, financing source, and investment preferences (H1f). For this purpose, a t-test was conducted on homeowners and non-owners, with ownership of house as independent variable and purpose, time period, preference, and financing and investment preferences as dependent variables. The summary of the results is presented in Table 12.

Table 12: Results of t-test for influence of owners and non-owners on dependent variables

Influence of owners & non-owners on dependent variables							
Dependent Variables	**F**	**Method**	**T-value**	**P**	**Owners**	**Non-Owners**	**Conclusion**
					Mean	**Mean**	
Purpose	1.16	Pooled	1.86	0.0639	1.714	1.6190	Not Significantly different
Time Period	1.47	Satterthwaite	-3.99	<0.0001	2.4597	2.8435	Significantly different
F/Preference	1.42	Satterthwaite	-1.88	0.0610	1.147	1.2302	Not Significantly different
Financing	1.22	Pooled	-0.99	0.323	1.1429	1.1825	Not Significantly different
Investment Preference	1.03	Pooled	0.81	0.4170	1.4412	1.3968	Not Significantly different

As per the t-test conducted above, with the threshold p-value for the analysis of 0.05, there is no significant difference between owners and non-owners with respect to purpose of investment, type of dwelling, financing source, and investment preferences. However, there is a difference in the time period for both groups' holding of the property, and it is statistically significant. The time period for owners holding the property mean (M=2.4597) is significantly less than the mean of non-owners (M=2.8435).

To determine the association between home ownership status and time period for holding the property, the Chi-square test was conducted. The Chi-Square value was 0.0009 proving association is statistically significant.

Table 13: Chi-square ownership & time period

Statistics for Table of VAR2 by _3__Time_Period__holding_propert

Statistic	DF	Value	Prob
Chi-Square	3	16.6047	0.0009
Likelihood Ratio Chi-Square	3	19.2740	0.0002
Mantel-Haenszel Chi-Square	1	13.6734	0.0002
Phi Coefficient		0.2257	
Contingency Coefficient		0.2202	
Cramer's V		0.2257	

Effective Sample Size = 326
Frequency Missing = 38

To determine the exact association, row percentages were taken. Homeowners are more likely to be in the time scale of 1.5 years (18.01%) compared to non-owners (3.48%), whereas non-owners are most likely to be in the time scale of 8 years & 13 years (49.57% & 19.13%) compared to owners (38.39% & 12.80%). The test results are presented in Table 14. The p-value of 0.0009 is significantly less than the alpha value of 0.05, showing that at least one proportion of the owners and non-owners in the time scale is not the same. Looking at the column percentages, we see that non-owners showed the highest percentage (44.90%) in the time scale of 13 years, whereas the homeowners group's highest percentage (90.48%) was in 1.5 years.

Table 14: Table analysis Ownership & Time period

Frequency
Percent
Row Pct
Col Pct

Table of VAR2 by _3__Time_Period__holding_propert					
	_3__Time_Period__holding_propert(3- Time Period (holding property))				
VAR2(1- House ownership (Y/N))	1	2	3	4	Total
1	38 11.66 18.01 90.48	65 19.94 30.81 67.01	81 24.85 38.39 58.70	27 8.28 12.80 55.10	211 64.72
2	4 1.23 3.48 9.52	32 9.82 27.83 32.99	57 17.48 49.57 41.30	22 6.75 19.13 44.90	115 35.28
Total	42 12.88	97 29.75	138 42.33	49 15.03	326 100.00
Frequency Missing = 38					

From the results, presented above, we can conclude that real estate development practices are independent of housing ownership status in terms of purpose, preferences, and mode of financing. The holding property time period is significantly associated with home ownership status. The non-homeowners held onto property longer than the houseowners.

4.3.3 Development as a function of financialization

4.3.3.1 Property investment as function of housing need

To determine whether investment in property is primarily with the objective to construct a house or for the sole purpose of investment either to make money or to save for the future, the following hypotheses was developed to understand the purpose of investment in real estate: H1a-Purpose of investment is independent of the purpose of return on investment and the construction of a house. The null hypothsis was that there is no difference in purpose of investment for housing and for return on investment, whereas an alternate hypothsis will be: return on investment purpose is higher than housing purpose. Return on investment includes: investement for profit, investment for children and investment to avoid currency devaluation as explained in section 3.4.1. The t-test was conducted to test the hypotheses . Investment for the purpose of house construction is coded as 1 and investment for the purpose of earning profit is coded as 2. According to the t-test, the t-value was 68.75 with a p-value of <0.0001 and a mean of 1.6813. We reject the null hypotheses and conclude that the purpose of investment for profit earning is greater than the housing purpose. The t-test values are presented in Table 15.

Table 15: t-test purpose of real estate investment

Variable: _2__Purpose_of_real_estate_Inves (2- Purpose of real estate investment)

N	Mean	Std Dev	Std Err	Minimum	Maximum
364	1.6813	0.4666	0.0245	1.0000	2.0000

Mean	95% CL Mean		Std Dev	95% CL Std Dev	
1.6813	1.6332	1.7294	0.4666	0.4350	0.5032

DF	t Value	Pr > |t|
363	68.75	<.0001

In addition to the above, two sample t-tests were conducted for the following hypotheis: H1b- Purpose of investment is independent of ownership status and location of respondents. The objective here was to determine whether there was any difference between purpose of investment between homeowners/non-owners and the city and country respondent groups.

Two sample t-tests were conducted separately for the two categories mentioned above. The first test was conducted to determine any difference of purpose between homeowners and non-owners. The status of house ownership (VAR2) is categorized as owners (1) and non-owners (2). Note that by the pooled method, the p-value of 0.0639 is not statistically significant, so there is no difference in values of owners' (1.7143) and non-owners' (1.6190) purpose of investment. The corresponding values are shown in Table 16.

Table 16: t-test purpose grouped by ownership status

Variable: _2__Purpose_of_real_estate_Inves (2- Purpose of real estate Investment)

VAR2	N	Mean	Std Dev	Std Err	Minimum	Maximum
1	238	1.7143	0.4527	0.0293	1.0000	2.0000
2	126	1.6190	0.4876	0.0434	1.0000	2.0000
Diff (1-2)		0.0952	0.4650	0.0512		

VAR2	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
1		1.7143	1.6565	1.7721	0.4527	0.4154	0.4975
2		1.6190	1.5331	1.7050	0.4876	0.4339	0.5565
Diff (1-2)	Pooled	0.0952	-0.00552	0.1960	0.4650	0.4335	0.5016
Diff (1-2)	Satterthwaite	0.0952	-0.00802	0.1985			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	362	1.86	0.0639
Satterthwaite	Unequal	238.9	1.82	0.0705

The second test was conducted to determine any difference in purpose between the group of respondents from the City of Islamabad (2) and the respondents from the entire country (1). Two sample t-tests were conducted and they are presented in Table 17. Observing the pooled method, the p-value of 0.6817 has no statistical significance; therefore, there is no difference between purpose of investment mean value of the national group(1.6690) and the purpose of investment mean value of the city group (1.6895).

Table 17: t-test purpose grouped by group of respondents

Variable: _2__Purpose_of_real_estate_Inves (2- Purpose of real estate Investment)

Group	N	Mean	Std Dev	Std Err	Minimum	Maximum
1	145	1.6690	0.4722	0.0392	1.0000	2.0000
2	219	1.6895	0.4638	0.0313	1.0000	2.0000
Diff (1-2)		-0.0205	0.4671	0.0500		

Group	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
1		1.6690	1.5915	1.7465	0.4722	0.4234	0.5338
2		1.6895	1.6277	1.7513	0.4638	0.4240	0.5118
Diff (1-2)	Pooled	-0.0205	-0.1189	0.0778	0.4671	0.4355	0.5038
Diff (1-2)	Satterthwaite	-0.0205	-0.1193	0.0782			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	362	-0.41	0.6817
Satterthwaite	Unequal	304.59	-0.41	0.6828

The investment in property for the purpose of return on investment held priority over housing need. In addition, from the analysis above, the behavior towards investment purpose is independent of housing ownership status and is also similar across the country.

4.3.3.2 Property investment as a function of business preferences

The T-test was conducted to determine the association between the groups of respondents and the preference of sector for investment (H1c). The mean value of sector preference was 1.4258 with 57.42% respondents preferring the real estate sector compared to 42.58% for other sectors. There is no significant difference between the respondent groups' means as shown in Table 18.

Table 18: t-test investment sector

Property investment as function of business preferences							
Dependent Variables	**F**	**Test**	**T-value**	**P**	**Real Estate Sector**	**Other Sectors**	**Conclusion**
					Mean	**Mean**	
Sample Groups	1.03	Pooled	-1.03	0.3056	1.3931	1.4475	Not Significantly different
House Ownership	1.03	Pooled	0.81	0.4170	1.4412	1.3968	Not Significantly different

The responses of the respondents grouped by home ownership and the respondents from city and entire country are presented in Table 19. Response distribution is in consistent with the results shown in Table 18.

Table 19: Investment sector and other group distribution

Investment Sector	Ownership	Non-ownership	Group 1	Group 2
Real Estate	55.88%	60.32%	60.69%	55.25%
Other Business Sectors	44.12%	39.68%	39.31%	44.75%

From this we can conclude that real estate is the preferred sector for investment irrespective of the respondent's location or status of home ownership.

4.3.3.3 Holding property is the function of sources of capital finance.

One of the assumptions for holding unutilized land is the availability of capital finance to construct a house (H1d). As mentioned above, 84% of respondents preferred non-banking channels to finance their home's construction. To determine the association between preference of sources of finance and time period holding the property, a t-test was conducted. The data were normally distributed as shown in fig 4.

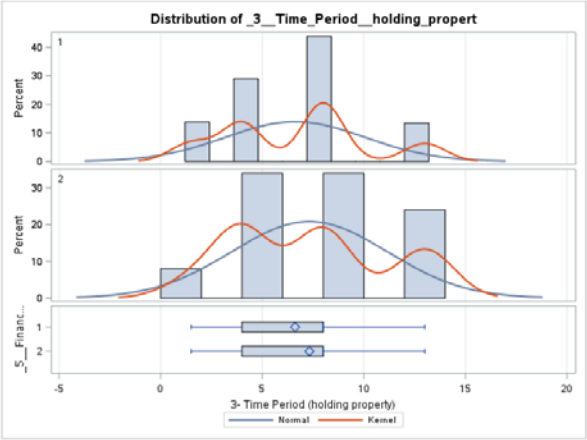

Figure 5: Distribution time period

The t-test, therefore, was fitting. Whereas, the p value of 0.2141, as shown in Table 21, is greater than the alpha value of 0.05, there is no significant difference found between the mean value of respondents preferring the banking sector (mean of 2.7400) over the non-banking sector (mean of 2.5688) time period for holding the property as compared to the overall mean value of 2.59.

Table 20: T-test sources of finance

Dependent Variables	F	Method	T-value	P	Others	Banks	Conclusion
					Mean	Mean	
Time Period	1.07	Pooled	-1.24	0.2141	2.5688	2.7400	Not Significantly different

The Chi-square value P is 0.1339 greater than the alpha value of 0.05; therefore, the association is not statistically significant. We have concluded then that there is no association between mode of financing and time period.

Table 21: Chi-square test-Financing mode & time period

Statistics for Table of _5__Financing_Mode by _3__Time_Period__holding_propert

Statistic	DF	Value	Prob
Chi-Square	3	5.5803	0.1339
Likelihood Ratio Chi-Square	3	5.3716	0.1465
Mantel-Haenszel Chi-Square	1	1.5469	0.2136
Phi Coefficient		0.1308	
Contingency Coefficient		0.1297	
Cramer's V		0.1308	

Effective Sample Size = 326
Frequency Missing = 38

Frequency
Percent
Row Pct
Col Pct

Table of _5__Financing_Mode by _3__Time_Period__holding_propert

_5__Financing_Mode(5- Financing Mode)	_3__Time_Period__holding_propert(3- Time Period (holding property)) 1	2	3	4	Total
1	38 11.66 13.77 90.48	80 24.54 28.99 82.47	121 37.12 43.84 87.68	37 11.35 13.41 75.51	276 84.66
2	4 1.23 8.00 9.52	17 5.21 34.00 17.53	17 5.21 34.00 12.32	12 3.68 24.00 24.49	50 15.34
Total	42 12.88	97 29.75	138 42.33	49 15.03	326 100.00

Frequency Missing = 38

4.3.3.4 *Holding property is a function of business preference*

As per the two sample t-tests for preferred investment sector investment and time period of holding the property (H1e), we found a significant difference between the mean holding property of people preferring the real estate sector (M=2.4742) and the preference for other investment sectors (M=2.7727).

Table 22: t-test preferred investment sector

Dependent Variables	F	Method	T-value	P	Real estate	Other Sectors	Conclusion
					Mean	Mean	
Time Period	1.04	Pooled	-2.99	0.0030	2.4742	2.7727	Significantly different

To determine the association between preferred investment sectors and time period for holding the property, a Chi-square test was conducted. The Chi-Square value was 0.0205 proving that the association is statistically significant. To determine the exact association, row percentages were taken. Those preferring the real estate sector (33.51%) are more likely to be in category of 3-5 Years as compared to 24.24% of people preferring other sectors for investment. Other sectors are most likely to be in 11+ years (21.21%) compared to the real estate sector (10.82%). The test results are presented in Table 23. The p-value of 0.0205 is significantly less than the alpha value of 0.05; therefore, at least one proportion of owners and non-owners in the time scale is not the same. By using the values of row percentages, the real estate sector had the highest percentage

(69%) in the time scale of 1-2 years and 67.01% in the time scale of 3-5 years, whereas the other sectors' highest percentage (57.14%) was in the time scale of 11+ years.

Table 23: Chi-Square test preferred sector

Statistics for Table of _6__Investment_Sector by _3__Time_Period__holding_propert

Statistic	DF	Value	Prob
Chi-Square	3	9.7630	0.0205
Likelihood Ratio Chi-Square	3	9.7547	0.0208
Mantel-Haenszel Chi-Square	1	8.7305	0.0031
Phi Coefficient		0.1732	
Contingency Coefficient		0.1707	
Cramer's V		0.1732	

Effective Sample Size = 326
Frequency Missing = 38

Frequency
Percent
Row Pct
Col Pct

Table of _6__Investment_Sector by _3__Time_Period__holding_propert

_6__Investment_Sector(6- Investment Sector)	_3__Time_Period__holding_propert(3- Time Period (holding property)) 1	2	3	4	Total
1	29 8.90 14.95 69.05	65 19.94 33.51 67.01	79 24.23 40.72 57.25	21 6.44 10.82 42.86	194 59.51
2	13 3.99 9.85 30.95	32 9.82 24.24 32.99	59 18.10 44.70 42.75	28 8.59 21.21 57.14	132 40.49
Total	42 12.88	97 29.75	138 42.33	49 15.03	326 100.00

Frequency Missing = 38

We can conclude that significant association exists between the business sector preference and property holding time period. Doing business with the real estate sector is quicker in terms of transactions as compared to doing business with other sectors.

4.3.4 Development as a function of unsustainable practice

4.3.4.1 Holding property is a function of time required to build a house

In this section, the following hypotheses is tested: H2a-Holding property is a function of time required to build a house. In general, one to two years are required to construct a house. This study tested the mean of 1 with the sample mean.

Null hypotheses = There is no significant difference between sample mean and comparison value

Alternate hypotheses = There is a significant difference between observed mean m_0 and sample mean μ

One Sample T-test was conducted and the results are presented below in Table 24.

Table 24: t-test-time period

Variable: _3__Time_Period__holding_propert (3- Time Period (holding property))

Tests for Normality				
Test	Statistic		p Value	
Shapiro-Wilk	W	0.873775	Pr < W	<0.0001
Kolmogorov-Smirnov	D	0.248065	Pr > D	<0.0100
Cramer-von Mises	W-Sq	3.212206	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	17.51583	Pr > A-Sq	<0.0050

Variable: _3__Time_Period__holding_propert (3- Time Period (holding property))

N	Mean	Std Dev	Std Err	Minimum	Maximum
326	2.5951	0.8954	0.0496	1.0000	4.0000

Mean	95% CL Mean		Std Dev	95% CL Std Dev	
2.5951	2.4975	2.6927	0.8954	0.8315	0.9699

DF	t Value	Pr > |t|
325	32.17	<.0001

The plots of the data are fairly symetric and seem to follow a normal distribution; therefore, the t-test is appropriate.

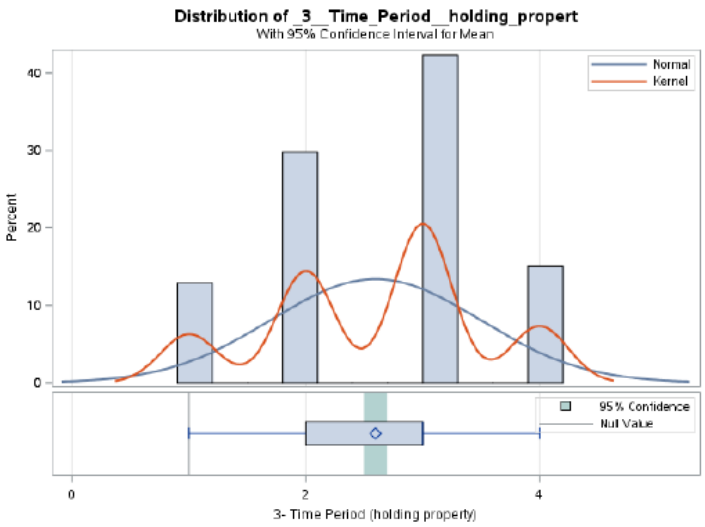

Figure 6: Distribution time period

T- value 32.17 and P value <0.0001 are less than alpha value 0.05; therefore, we reject the null hypotheses and conclude that the mean of 2.5951 is higher than 1 (1-2 Years). From this result we find that the average timeframe for holding developed land is between 6 to 10 years, which is significantly higher than the time required to build a house. Therefore, holding unutilized property is not just for the time required to build a house.

4.3.4.2 Urban development pattern as a function of individual preference

Peoples' preferred dwelling type plays a key role in urban development and expansion patterns (H2b). A Chi-square test was conducted to test living preferences, as an independent variable, against all other variables of the study as dependent variables. The dependent variable, the preferred type, was categorised into the preference for a single-family independent house and the preference for a multifamily apartment building. The p-value, for dependent variables of purpose of investment, mode of payment, and distance from basic amenities, was greater than the alpha value of 0.05; therefore, the difference was not statistically significant. All other dependent variables, including house ownership status, time period, and mode of finance,

investment sector, and preference for infrastructure, property price, and natural landscape carry statistically significant values. I will discuss them one by one in detail in coming sections.

Table 25: Influence of preferred form of housing

Influence of preferred form/type of housing					
Variables	P-Value	**Independent house preference**		**apartment building preference**	
4-House ownership	0.0475	Ownership 67.67%	Non/OS 32.33%	Ownership 54.69%	Non/OS 45.31%
9- Time period	0.0050	1-2Y - 14.18% 6-10Y – 41.82%	3-5 Y - 31.64% 11+Y – 12.36	1-2Y – 5.88% 6-10Y – 45.10%	3-5 Y – 19.61% 11+Y – 29.41%
15-Mode of Finance	0.0007	Saving – 87.33%	Bank – 12.67%	Saving – 70.31%	Bank – 29.69%
16-Investment sector	0.0004	Realestate-61.67%	Others-38.33%	Realestate-37.50%	Others-62.50%
17-Infrastructure	<0.0001	High – 76.33%	Medium-22.67%	High-45.31%	Medium-42.19%
21-Land/house prices	0.0010	High-29.67%	Medium-54.67	High-50.00%	Medium-29.69%

The relationship between preferences for housing type and ownership status, with a p-value of 0.0475, is statistically significant. People with a preference for an independent house had 67.67% ownership of house compared to 54.69% ownership in people who prefer multifamily buildings. The people who prefer multistory buildings are more likely to be renting with a 45.31% non-ownership status compared to 32.33% in other cases.

Time period also had a significant relationship with preferences. The p-value 0.0050 is significantly significant. The preference for an independent house is more likely to fall within the time scale of six to ten years, whereas preference given to multifamily apartment buildings remains in the time scale of 11+ years. We can conclude that a preference for an independent house usually has a shorter waiting period than the wait for a multifamily apartment building.

Mode of finance also has a significant relationship with preferences. The p-value of 0.0007 shows a statistically significant relationship. People who prefer single-family houses (87.33%) tend to stick with non-banking sources of finance such as self-savings, common pool, and/or borrowing from friends and family members. Multifamily apartment lovers (29.69%), on the other hand, are more likely to go with the banks compared to 12.67% in the case of single-family house residents.

Similarly, the relationship of preference with preferred sector for investment carries a statistical significant relationship with a p-value of 0.0004 less than the alpha value of 0.05. Single-family home lovers (61.67%) are most likely to prefer investment in the real estate sector compared to 37.50% in other cases. People who opt for multifamily apartments (62.50%) are most likely to prefer sectors other than real estate for investment. From this we can conclude that people preferring single-family, low-density housing also prefer the real estate sector for investment purposes; whereas the multifamily apartment option is more sustainable in terms of high density along with a balanced approach for business activities.

4.3.4.3 Location preferences and development pattern

Location plays a very important role in day-to-day urban functions. Distance from school, workplace, and markets determines the daily commuting requirement; while provision of facilities, amenities, and natural landscape helps in creating a conducive environment for living. Despite all the functional requirements of urban living space, price becomes the major decisive factor when choosing a property for the purpose of buying or renting.

To determine the general trend of location selection, a series of questions were included in the survey. The list of dependent variables and frequency distribution is presented in Table 26 for the whole sample irrespective of groups.

Table 26: Location Preference Frequency Distribution

Location Preference Frequency Distribution									
Location variables	Mean	Median	Mode	1 – High		2 – Medium		3 - Low	
Sample size = 364				Freq.	Percent	Freq.	Percent	Freq.	Percent
17- Roads/Water Sewage	1.32	1	1	258	70.88 %	95	26.10 %	11	3.02 %
18 – Distance from School	1.87	2	2	115	31.59 %	180	49.45 %	69	18.96 %
19 – Distance from Workplace	1.83	2	2	113	31.04 %	197	54.12 %	54	14.84 %
20 – Distance from City Center	1.90	2	2	109	29.95 %	181	49.73 %	74	20.33 %
21 – Land/house prices	1.83	2	2	121	33.24 %	183	50.27 %	60	16.48 %
22 – Natural landscape	1.70	2	2	156	42.86 %	158	43.41 %	50	13.74 %

In contrast to distance and prices, respondents clearly prioritized availability of basic infrastructure when choosing the location for their residence. Basic infrastructure took a 71%

high preference with a mean value of 1.32 and considered as the top priority when choosing a location for living purposes. Distance from school, workplace, and city center was a medium priority by 50% of the respondents. Similarly, land prices also received a medium level of importance by 50% of the respondents.

Our hypothesis was that the location preference is independent of the ownership status, type of house, and commercial interests such as purpose, holding period, and business interests (H2d).

To determine the relationship between location preferences as a dependent variable with independent variables such as house ownership status, purpose of buying property, property holding time period, preferred type of house, financing mode, and preferred investment sector were analyzed by Chi-square tests. As presented in Table 27, there is no significant relationship found between purpose of investment, time period and mode of finance with any of the location-preference dependent variables. Home ownership status had no significant relationship with location preference variables except for distance from the city center. The p-value for ownership status and distance from city center was 0.0465; therefore, significant. To determine the association, we looked at the row percentages group with the home ownership group, which are more likely to rate a medium preference (52.52%) compared to the non-owners (44.44%). Whereas non-owners are most like to prefer high (38.10%) compared to owners (25.63%). We can conclude that for rental purposes, people do give preference to distance from city center, while this may or may not be due to daily commutation requirements.

Table 27: Influence on preferred location dependent variables

Influence of preferred location dependent variables		
Row/independent Var.	Column/dependent Var.	p-value
4- Owners/Non-owner	20 – Distance from City Center	0.0465
6- Purpose investment (House or profit)	Not Significant	
9- Time period	Not Significant	
13- Form of housing (independent house or apartment)	17- Roads/Water Sewage	<0.0001
13- Form of housing (independent house or apartment)	21 – Land/house prices	0.0010
15- Mode of finance (saving or bank)	Not Significant	
16-investment sector (real estate or others)	17- Roads/Water Sewage	0.0018

The group of respondents who preferred the real estate or other sectors for investment had a significant relationship with only the basic infrastructure provision variable of preferred location. The p-value for the investment sector and basic infrastructure was 0.0018. The group who preferred the real estate sector for investment (77.99%) showed a high preference for the basic infrastructure provision compared to 61.29% of respondents giving preference to other investment sectors. The group who preferred sectors other than real estate for investment mostly showed a medium preference (35.48%) for the basic infrastructure provision while considering any location for investment. Significance of association is shown in Table 28.

Table 28: Association between preferred sector & preferred location

Frequency
Percent
Row Pct
Col Pct

Table of _6__Investment_Sector by _7__Facilities_Infra_Preferrence				
_6__Investment_Sector(6-Investment Sector)	_7__Facilities_Infra_Preferrence(7- Facilities Infra_Preferrence_such as roads, water, sewerage etc)			
	1	2	3	Total
1	163 44.78 77.99 63.18	40 10.99 19.14 42.11	6 1.65 2.87 54.55	209 57.42
2	95 26.10 61.29 36.82	55 15.11 35.48 57.89	5 1.37 3.23 45.45	155 42.58
Total	258 70.88	95 26.10	11 3.02	364 100.00

From the data analysis above, we conclude that purpose of investment, time period, and business preferences are independent of location, whereas preferred type of housing carries a significant association with infrastructure facilities and land/house prices. On the other hand, we find no significant association with the distance of communities from places and amenities needing daily commuting. The analysis above confirms that urban sprawl is facilitated by both investment purposes as well as preference for single-family housing. Single-family and multifamily housing preference and its relationship with selection of location is explored further in the next section.

Now the relationship between preferred type of housing and preferred location in which to live is explored. No significant relationship was found with either landscape features or distance from school, city center, and workplace, but a significant relationship in the case of basic infrastructure provision and land/house prices was found. The p-values for infrastructure and land/house prices were <0.0001 and 0.001, respectively. People who preferred low density single-family dwelling showed a high preference (76.33%) for infrastructure and a medium preference (54.67%) for

land/house price. The Table analysis of preference for infrastructure facilities is presented in Table 29.

Table 29: Association between Preferred form & Infrastructure facilities

Frequency
Percent
Row Pct
Col Pct

Table of _4__Preferred_form_for_living by _7__Facilities_Infra_Preferrence				
_4__Preferred_form_for_living(4- Preferred form for living)	_7__Facilities_Infra_Preferrence(7- Facilities Infra_Preferrence_such as roads, water, sewerage etc)			
	1	2	3	Total
1	229 62.91 76.33 88.76	68 18.68 22.67 71.58	3 0.82 1.00 27.27	300 82.42
2	29 7.97 45.31 11.24	27 7.42 42.19 28.42	8 2.20 12.50 72.73	64 17.58
Total	258 70.88	95 26.10	11 3.02	364 100.00

People who preferred multifamily apartment buildings over single-family low density buildings were more likely to give high preference (50%) to land/house prices and medium preference (42.19%) to infrastructure provision while choosing a location for living purposes. The table analysis of preference over land/house price is presented in Table 30.

Table 30: Association between preferred form & land/house prices

Frequency
Percent
Row Pct
Col Pct

Table of _4__Preferred_form_for_living by _11__Land_house_price_Preference				
_4__Preferred_form_for_living(4- Preferred form for living)	_11__Land_house_price_Preference(11- Land/house price_Preference)			
	1	2	3	Total
1	89 24.45 29.67 73.55	164 45.05 54.67 89.62	47 12.91 15.67 78.33	300 82.42
2	32 8.79 50.00 26.45	19 5.22 29.69 10.38	13 3.57 20.31 21.67	64 17.58
Total	121 33.24	183 50.27	60 16.48	364 100.00

From these results, I can conclude that in either case, low- or high-density housing preferences, people do not give much importance to the distance from their residence to places that require daily commuting. Those who prefer independent houses gives show a higher preference to the infrastructure provision while people preferring multifamily apartment buildings seem more price-conscious.

Section 5 - Discussion and conclusion

5.1 Introduction

In this chapter, the details of the analysis, description of statistical results, contributions within the study, and the study's limitations are all discussed. The results confirm that market practices are motivated by financialization of property and that they impact urban sprawl and sustainability of urban residential land development.

In this study, while adopting various approaches to data collection, along with physical observation and market knowledge, I have highlighted general market practices' and residential land development's impact on the overall sustainability of the urban environment in relation to urban sprawl. There are numerous sustainability factors involved in urban development; this study was limited to the walkability of residential communities to identify its relationship with urban sprawl and financialization of land developments. The following section describes current development practices as a function of financialization and their impact on urban sustainability when there is a slower rate of housing construction on developed urban land.

Data collected through survey are found to be significantly consistent among the groups of participants from both local and national levels, and participants' home ownership status, but with a slight difference in holding property time period and preferences over types of housing. The home ownership percentage, along with preferences of mode of finance and investment sector, remains the same among the groups of participants from both the city of Islamabad and nationwide. The only difference found between these two groups was a preference over the preferred type of housing. Nationwide respondents prefer single-family housing, whereas city respondents prefer multifamily residential apartments. Similarly, groups of people with or without housing ownership (owners and non-owners) showed no difference in variables, with the exception of holding property time period and distance from city center when choosing a property for living purposes. Respondents who are non-owners intend to hold on to their future property for longer periods than do people living in their own homes. Furthermore, non-owners

preferred a location closer to the city center. This confirms that the data collected are significantly consistent along all sample groups.

The specific research question of this study is: How does financialization of urban development influence occupancy growth and urban sustainability in Islamabad, Pakistan? This question was further subdivided into the following two questions. Question 1: Are current land development practices a financialization of urban land? And, question 2: Are urban land development practices sustainable in the city of Islamabad, Pakistan? The results associated with each question and their respective hypotheses are discussed in the next section.

5.2 Development as a function of financialization

To answer the first question, the results of the hypotheses are discussed one by one.

This section explains the factors confirming the current practices under the influence of financialization. The hypotheses and descriptive statistical analysis confirms the dominance of financialization in current property and land development practices. In the local model of urban development, only land is developed by the developers, and possession is transferred to individual buyers upon completion of basic infrastructure. Housing construction is then executed by individual owners as per their own convenience or requirements. Due to individual decision-making in converting developed land into a useful form for living purposes, it is necessary to understand individual motivation and common practices while dealing with the real estate sector.

My hypotheses confirm that the majority of the property investment decisions are made under the motivation of return on investment (68%) rather than on solely the need for housing. Here it is worth mentioning that there is no difference in motivation between people with or without home ownership.

Like 68% of the respondents motivated towards return on investment rather than construction of house, 60% of the respondents preferred investing in the real estate sector as the best sector for investment. The motivation towards real estate investment confirms that most of the respondents treat land as a trading commodity, thus confirming that that sector is influenced by financialization.

Summary of hypotheses supporting this question is presented below:

- Purpose of Investment in property – (H1a, H1b)

  The results confirm that purpose of investment in property for return on investment is greater than the purpose of house construction alone (H1a). In addition, we can also conclude from the analysis above that the behavior towards investment purpose is independent of housing ownership status and similar across the country (H1b).

- Property investment is a function of business preferences – (H1c)

  The result confirms that real estate is among the preferred sectors for investment irrespective of a respondent's location or status of house ownership.

- Holding unutilized property is a function of sources of capital finance toward building the house – (H1d)

  The study confirms that holding property is independent of the sources of finance.

- Holding property is a function of business preferences – (H1e)

  The results conclude the existence of a significant association between business sector preference and property-holding time period. People in the real estate business make quicker transactions as compared to people in other types of businesses.

From the results presented above and to answer the question "Are current land development practices a financialization of urban land?", the study concludes that people prefer to invest in real estate, with the prime objective of return on investment, rather than solely in house construction. This is further supported by investment motivations independent of sources of finance, location, and housing ownership status. Thus, we can confirm that land development practices in the city of Islamabad are under the influence of financialization rather than on solely meeting housing demand.

5.3 Development practices and sustainability

The objective of the study is to assess the relationship between sustainability of urban land development practices and real estate investment practices. Once financialization of real estate practices was confirmed, urban land development pattern was analyzed to assess in terms of its sustainability. The unsustainability of low-density urban sprawl has been confirmed by many researchers. By limiting this study to confirmation of urban sprawl through low-density housing development, and walkability due to occupancy rate, the unique element of this study is the holding of unutilized developed land for long periods of time, with the possible consequences on both the natural as well as the urban built environment. Due to time and scope limitations, this study focused only on the confirmation of the general practices around keeping developed land unutilized and this land's effect on walkability, whereas its environmental impact was excluded from the scope.

Urban sprawl, as discussed in Chapter 2, is a direct result of land prices, urban development regulations towards density, and general practices in terms of market motivations and preferences. Urban land development practices were analyzed in terms of development regulations, market practices, and preferences.

The city government land development regulations are based on low density single-family housing subdivisions. In addition, land development practices encourage private developers of residential land subdivisions by providing basic infrastructure and transfer of land ownership to individuals. Then it depends on an individual's decision and requirement to either construct a house, keep the land unutilized for resale, or for future use. These practices confirm that low-density housing developments result in urban sprawl. It was necessary to assess contribution of individual priorities and practices in land development practices.

As per the result presented in the previous section, the hypotheses confirm that developed land is kept unutilized more that the average time required to build a house. Of the data collected, the average house construction period of 1-2 years is much less than the mean time period of holding property (Mean 2.59) which falls in the category of 6-10 years. This confirms that there is a longer property-holding period before either transferring the title or constructing the house.

Regarding individual preferences, and confirmed by the statistical analysis in Chapter 4, people prefer single-family houses and investing in real estate, providing evidence that there is a significant relationship between these preferences. This yet again confirms that encouragement of low density urban development contributes to overall urban sprawl.

Distance from the city core plays an important role in determining the element of sprawl, and it has a direct impact on social, economic, and environmental sustainability of urban form. The people's preference of location for living, irrespective of distance from city center, workplace, and basic amenities such as schools, encourages vehicle dependent urban developments. Low density and slower occupancy rate affect the economic efficiency of fundamental necessities like transport, neighbourhood amenities, and operational and maintenance cost recovery. The study confirms that high (70%) preference is given only to provision of infrastructure when choosing the location of residence, whereas medium and low preferences were given to other important elements of distance from the city center, workplace, and schools.

From these results, we can conclude that with either low- or high-density housing preferences, people do not give importance to distance of their residence from the places needing daily commuting. Whereas those people who prefer independent houses show a higher preference to provision of infrastructure. And, people who prefer multifamily apartment buildings are more price-conscious.

The historical data on housing construction on residential land confirms that there is a slow rate of occupancy of developed land. This study also confirms that occupancy rate and walkability have a positive and strong correlation. It means that lower occupancy communities are less walkable than communities with higher occupancy. As per the data collected, residential communities achieved a Walk Score of 50 over 10 years with around 50% occupancy.

The study also confirms that general market practices, business patterns, and motivations encourage urban sprawl and low-density development, resulting in a slower rate of occupancy. This directly affects the walkability of residential neighbourhoods, taking longer periods to reach than it would to comparatively walkable neighbourhoods.

A summary of the hypotheses is presented below;

- Holding property is a function of time required to build a house – (H2a)

  Null hypothesis was rejected. What was concluded is that the unutilized property-holding time period is greater than the period required to construct a house (i.e., individuals hold onto developed urban land more than the time required to construct a house).

- Urban development pattern is independent of individual preferences – (H2b).

  The results confirm that most of the respondents prefer single-family houses; the type of house preference has a significant relationship to the property-holding time period; real estate is the preferred sector of investment; financing through individual sources gives preference to infrastructure and land/house prices when choosing property for living purposes.

- Motivation towards property and development practices are similar across the country – (H2c).

  The results confirm that people's motivations and practices around real estate and property are similar across the country.

- Location preference is independent of ownership status, type of house and commercial interests such as purpose, holding period and mode of finance – (H2d)

  The study confirms that there is no significant relationship between location preference and commercial interests such as purpose, holding period, and business interests, whereas location preferences have a significant relationship with home ownership status, preferred form/type of house, and preferred investment sector.

5.4 Conclusion

The findings of this study can be used to assess the financialization factor within land development practices in Pakistan and the factor's relationship with urban sustainability with respect to urban sprawl. These findings can also be used towards policy development by considering both real estate market demands and housing needs for more sustainable community development, and for controlling urban sprawl and agricultural land conversion to unutilized urban land.

Cities form a complex configuration of social, economic, environmental, governance, and development pattern. Urban geography, population concentration, and density define the nature of design and distribution of resources. Urban sustainability in terms of livelihood, environment, and efficient use of resources is directly related to efficient concentration of population, whether planned or unplanned. For efficient cities, it is important to consider operation and services cost, provision of amenities, and cost of performing urban fundamental functions. The trend for urban sprawl, with its inefficient developments that are consuming cities' peripheral green spaces, is growing faster than the population (Bruchell, Shad, Listokin, & Phillips, 1998). Such developments are encouraged in emerging economies with profit earning objectives (Breheny, 1997; Sousa, 2000). Although cost and negative externalities of urban sprawl has been acknowledged (Brueckner J., 2000; Freeman L., 2001; Kahn, 2000; Oxley, 2004), land market or real estate motivations with respect to urban sustainability has not been focused on. This study contributes to the literature by confirming land development is under the influence of profit earning objectives, and that urban sustainability issues with respect to land utilization and walkability are due to a slower rate of occupancy in developed residential communities.

The global urban population is continuously increasing with a high concentration mostly in Asian and African countries. Pakistan, as one of the most urbanized nations in South Asia, is facing urbanization challenges in terms of urban planning, land development, operations, and revenue generation. The growing trend of urbanization and inadequate formal housing (Malik & Wahid, 2014; Niazi & Khetran, 2007; HRCP, 2015), with poor urban planning, lack of capacity, and ineffective land use (Maria & Imran, 2006), has increased the inefficiency of public investments and policies to deliver public benefits to Pakistan. Despite the importance of real estate

development and the investments it holds, Pakistan's housing market is not functioning efficiently (Dowall & Ellis, 2007). Pakistani cities are expanding under the suburban model with low-density, vehicle-dependent residential developments, whereas it needs medium to high density, energy-conserving, and low demand travel communities (Haider, et al., 2014). Current practices of urban land development, particularly for residential use, is common in all cities of the country. This study confirms that the slower pace of housing construction on developed land is due to profit-earning motivations, resulting in low density and vehicle-dependent communities.

The City of Islamabad is facing many urban issues, including the ability to finance capital development, municipality operational cost, provision of urban services, quality of life, and economic development. In the last several decades, development of an economic base has been totally neglected (Adeel, 2010; Haider, et al., 2014). Increase in population and expansion of city boundaries have contributed to an increase in commuting costs, poor facilities, pollution, and greater health risks. Not only rural, but urban private developments too are lacking basic facilities, which several studies have identified as water supply, drainage, waste disposal, cleaning, and management (Saleem, Sharif, & Khursheed, 2015). Provision of amenities such as public transport, schools, and hospitals are difficult to find in close proximity due to very slow growth of occupancy in private developments. Slower rate of occupancy, as confirmed by this study, might have an effect on the revenue generation capabilities of residential communities, making it difficult for them to meet operational and maintenance expenditures.

Land development practices in Islamabad, like other cities, are primarily based on the site and service model. The private sector is engaged to develop land by providing basic infrastructure, provision of services, and operation. The prime objective is to provide land to meet the needs of houses and to generate funds to maintain city structure. Land is usually sold to individual owners on an installment basis before the start of a site's development. Construction of houses can begin upon completion of land development based entirely on the individual's decisions and needs. The entire city's development and current bylaws are encouraging low-density, vehicle-dependent residential developments. Despite there being large developments in the city,

housing shortage is still very much a growing reality, yet developed land is still being kept unutilized for prolonged periods of time.

Thinly populated and scattered urban development is creating social, economic, and environmental impacts. The objective of this study is to consider sustainability of urban development practices in Islamabad and to identify forces and motivations driving land development. To study the relationship between land development practices and urban sustainability, the relationship between the elements of financialization in urban development practices, market forces, and the impact on urban sustainability were explored.

The information gathered confirms that residential land developments are primarily treated as a trading commodity (Leyshon & Thrift, 2007). This is in line with the findings of this study, that people are holding developed land more than the average time required to build a house. Due to profit-earning and future savings objectives, developed land is being kept unutilized for prolonged periods of time before a house is actually built on it. This study confirms that investment in residential land development is with commercial interests and independent of location features. The results of this study also confirm that the financialization features of the real economy, such as location, characteristics, and technical specifications, have become irrelevant (Theurillat et al. 2010; Christophers, 2010), and that there is an uncommon approach to buying and selling (Altaprima & Ernst&Young, 2004) and buying and holding (Theurillat et al. 2010). All these factors have been contributing to low-density urban sprawl and consumption of grade one agricultural land, as discussed in the literature. Moreover, a growing backlog of housing need and unaffordability, despite extensive land conversion to urban form, indicates that land developers and investors are more interested in land development rather than in solely fulfilling housing needs.

It has been suggested that a reason for holding onto developed land may be due to financial constraints. This study finds no relationship between holding onto developed land and sources of finance, as opposed to the general perspective of capital finance being the main reason for prolonged periods of vacant developed land (MCC, 2015; HRCP, 2015). People's preferences for low-density single-family houses, non-banking financial channels, and investment priorities are

prompting low-density urban developments. Avoiding financial assistance from banks, relying on partial investment in housing projects by first buying land on installment and then financing housing construction cost through long-term savings plans also stimulate the land and service model. This confirms that real estate operates under the influence of individual actors and their behaviors (Squires & Heurkens, 2016), and defines its relationship with development dynamics (Healey, 1991). In contrast to site selection preference for amenities, and distance from workplace, schools, and shopping areas (Thomas, 2017), the study finds that people do not give preference to such features while investing in real estate.

The connection between the urban land development process, real estate practices, individual decision-making, and urban sustainability is either missing or less focused on in the literature (Nilsson, et al., 2014; Dodds & Dubrovinsky, 2015). This study highlights the possible relationship between urban sustainability, development practices, and individual objectives.

The residential urban land utilization rate by constructing a house, particularly in the land and service model, confirms that the land utilization rate is another important determinant of net absorption in addition to changes in rent, employment, income, and expectations (Sivitanidou R. M., 2011). All these factors contribute toward urban sprawl, with a slower rate of occupancy resulting in unsustainable communities in terms of availability of basic amenities within walking distance and increased vehicle dependency. These low-density and low-occupancy developments affect revenue generation capabilities, as a result, making it difficult to finance operational and maintenance expenditures (MCC, 2015). Moreover, land converted from agriculture form to urban form, without being utilized for housing purposes, increases such environmental impacts as decreased food production, increased impervious land surface, water runoff, decreased water penetration, heat island effects, and overall air quality.

It is necessary to create a balance between urban land development requirements for housing needs, investment requirements for revenue generations and individual savings requirements. Financialization of urban land development due to individual interests may hamper housing needs, cost of living, increased inequalities, and loss of green land. This study provides a unique aspect of studying financialization in a local context while observing land market motivation and

land development patterns. The study emphasises the need of incorporating market motivations and the future land development decision-making process, and for formulating sustainable urban growth strategies.

From this research, it is evident that individual decision-making and motivations towards real estate investment influence land development pattern. Developers motivated by profit-seeking and the majority of individual investors are using the site and service model to facilitate partial investment in residential urban land. The slower rate of house construction is affecting sustainability in terms of community walkability, and thus may also be affecting overall social and economic sustainability of the residents (particularly early movers to new communities). Private investment, being a major financial source of urban infrastructure development, may hamper efficient land utility through its massive conversion of agricultural land into urban form, slower occupancy rate, lower density, walkability, and other possible urban sustainability issues. Slower occupancy and lower density of residential communities may affect revenue generation capabilities in providing and maintaining fundamental public services and amenities. For efficient land utility and improved urban sustainability, it is therefore recommended to integrate land development market and individual motivations with overall urban land development strategy- and policy-making.

5.5 Recommendations & future research

It is recommended to review overall land development policy and development bylaws. It is necessary to increase density in residential communities by discouraging current land development practices that are primarily focused on single-family housing developments.

Government intervention is required to maintain supply of affordable housing by ensuring delivery of housing to the relevant segment of society.

Integrated policy development is required to cater to the requirements of availability and affordability of housing along with the investment mechanism of the real estate market. It is necessary to devise investment instruments to satisfy individual savings and investment requirements, incremental housing, and housing finance along with the real estate market

investment mechanism by avoiding unnecessary holding of unoccupied development land or buildup units solely for the purpose of return on investments.

Future research can be in the direction of integrated impact assessment of the real estate market on the urban built environment and the natural environment both in terms of environmental and economic sustainability. Further research is required in developing a policy framework to mitigate the impacts of financialization of urban development (i.e., residential developments) to meet housing demand as well as to avoid unnecessary land conversion by increasing land utility.

Further research is also required in the specific context of Pakistan to develop banking and financial models that would accommodate the public needs of both housing and future savings. Such models should also consider local traditional and religious beliefs and income constraints, with an objective to minimizing stress on urban sustainability.

Finally, in the global perspective, more research is required to assess the impact of real estate market motivations on urban form, property utilization, and overall environmental sustainability.

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Appendix A – Survey Tool

Questionnaire info letter

Title of Project: **Urban infrastructure finance and its relationship with land market, land development and sustainability**

You are invited to participate in a research study conducted by ***Muhammad Adil Rauf*** under the supervision of ***Professor Olaf Weber, School of Environment, Enterprise and Development*** of the University of Waterloo, Canada. The objectives of the research study are ***this study is to identify forces and motivations driving land development in the city. How land development decisions influence urban sustainability and revenue generation? My objective is to explore relationship between sources of capital finance, motivation and sustainability of the urban infrastructure development.*** The study is for a Master's thesis.

If you decide to volunteer, you will be asked to complete a ***2***-minute online survey that is completed anonymously. Survey questions focus on ***demographic information, preferences of real estate investments.*** Participation in this study is voluntary. You may decline to answer any questions that you do not wish to answer and you can withdraw your participation at any time by not submitting your responses. There are no known or anticipated risks from participating in this study.

It is important for you to know that any information that you provide will be confidential unless release of their data is required by law. All of the data will be summarized and no individual could be identified from these summarized results. Furthermore, the web site is programmed to collect responses alone and will not collect any information that could potentially identify you (such as machine identifiers).

"When information is transmitted over the internet privacy cannot be guaranteed. There is always a risk your responses may be intercepted by a third party (e.g., government agencies, hackers). University of Waterloo researchers will not collect or use internet protocol (IP) addresses or other information which could link your participation to your computer or electronic device without first informing you."

If you wish to participate, please visit the study website at [insert url].

The data, with no personal identifiers, collected from this study will be maintained on a password-protected computer database in a restricted access area of the university. As well, the data will be

electronically archived after completion of the study and maintained for seven years and then erased.

Should you have any questions about the study, please contact ***Muhammad Adil Rauf email:*** *m5rauf@uwaterloo.ca* or Dr. Olaf Weber Ph: +1 519-888-4567 x38065 38065 email: oweber@uwaterloo.ca Further, results will be available by December 31, 2016 and if you would like to receive a copy of the results of this study, please contact investigator.

This study has been reviewed and received ethics clearance through a University of Waterloo Research Ethics Committee. However, the final decision about participation is yours. If you have any comments or concerns resulting from your participation in this study, please feel free to contact Dr. Maureen Nummelin in the Office of Research Ethics at 1-519-888-4567, Ext. 36005 or maureen.nummelin@uwaterloo.ca. Please note that collect calls will be accepted and translators will be employed if necessary.

Thank you for considering participation in this study.

Consent to Participant

With full knowledge of all foregoing, I agree, of my own free will, to participate in this study. "By indicating your consent, you are not waving your legal rights or releasing the investigators or involved institution from their legal and professional responsibilities."

- "I agree to participate."
- "I do not wish to participate (please close your web browser now)."

Appendix B – Survey questionnaire 1/2

1. Do you own house in Pakistan?
   (Yourself or your spouse)
   - ☐ Yes
   - ☐ No
2. Your current purpose/intention for real estate investment is …. ***(Choose one)***
   - ☐ to buy plot to construct house in future
   - ☐ to buy plot to earn profit
   - ☐ to buy plot/house for children
   - ☐ to keep money safe for future and avoid currency devaluation
3. Any property you will purchase (or you purchased) for investment purpose, how long you will wait (or you wait) to sell the property? ***(longest total period in one case)***
   - ☐ 1-2 years
   - ☐ 3-5 years
   - ☐ 6-10 years
   - ☐ 11+ years
   - ☐ Not Applicable
4. Any plot you will purchase (or you purchased), how long it will take (or took) to construct the house? ***(Longest period from purchase of plot to ready house)***
   - ☐ 1-2 years
   - ☐ 3-5 years
   - ☐ 6-10 years
   - ☐ 11+ years
   - ☐ Not Applicable
5. Any plot you purchased (or planning to purchase), how long developer will take / took to provide possession?
   (Longest period only)
   - ☐ 1-2 years
   - ☐ 3-5 years
   - ☐ 6-10 years
   - ☐ 11+ years
   - ☐ Not Applicable
6. What form of real estate you prefer for investment purpose? –
   (Choose one best answer)
   - ☐ Plot
   - ☐ House
   - ☐ Apartment
   - ☐ Commercial (shops etc.)
   - ☐ Anyone with good return potential
7. What form you prefer for your living? –
   (Choose one)
   - ☐ Independent houses
   - ☐ Apartments in low rise
   - ☐ Apartments in high rise
8. How do you prefer to buy property? –
   (Choose one)
   - ☐ Payments by Installment
   - ☐ Payments by full (Upfront)
9. How do you prefer to finance your house construction/buying?
   (Choose as many as applies)
   - ☐ Self-saving
   - ☐ Crowd ***Go to second page …..***
   - ☐ Loan support from family & friends
   - ☐ Bank finance / mortgage
10. What is the best sector for investment or saving purpose? ***(Choose one best answer)***
    - ☐ Real Estate
    - ☐ Bank saving deposit / saving certificates etc.
    - ☐ Stock market / Forex market
    - ☐ Business or Business Partnership

Survey questionnaire 2/2

Q11-How will you choose locality for your own living purpose? ***(Rate your preferences)***

Facilities such as roads, water, sewerage etc.	High	medium	low
Distance from school	High	medium	low
Distance from your work place	High	medium	low
Distance from city center	High	medium	low
Land / House price	High	medium	low
Nature and natural landscape	High	medium	low

Appendix C – Survey questionnaire complete 1/2

1. What is your age? – Years
   - ☐ 19 Years or less
   - ☐ 20-30
   - ☐ 31-40
   - ☐ 41 or above
2. What is your gender?
   - ☐ Male
   - ☐ Female
   - ☐ Do not prefer to tell
3. What is your prime source of earning? – ***(Choose one)***
   - ☐ Overseas – Salaried
   - ☐ Overseas - Business
   - ☐ Domestic - government Salaried
   - ☐ Domestic – Private Salaried
   - ☐ Domestic – Business
   - ☐ Others
4. Do you own house in Pakistan? ***(Yourself or your spouse)***
   - ☐ Yes
   - ☐ No
5. Do you own real estate residential/commercial plot in Pakistan? ***(Yourself or your spouse)***
   - ☐ Yes
   - ☐ No
6. Your current purpose/intention for real estate investment is …. ***(Choose one)***
   - ☐ to buy plot to construct house in future
   - ☐ to buy plot to earn profit
   - ☐ to buy plot/house for children
   - ☐ to keep money safe for future and avoid currency devaluation
7. If you own plot in Pakistan, what is the prime purpose?
   - ☐ Return on investment
   - ☐ Construction of house
   - ☐ Both
   - ☐ Not Applicable
8. Have you invested in more than one real estate property in Pakistan?
   - ☐ Yes
   - ☐ No
   - ☐ Not Applicable
9. Any property you will purchase (or you purchased) for investment purpose, how long you will wait (or you wait) to sell the property? ***(longest total period in one case)***
   - ☐ 1-2 years
   - ☐ 3-5 years
   - ☐ 5-10 years
   - ☐ 11+ years
   - ☐ Not Applicable
10. Any plot you will purchase (or you purchased), how long it will take (or took) to construct the house? ***(Longest period from purchase of plot to ready house)***
    - ☐ 1-2 years
    - ☐ 3-5 years
    - ☐ 5-10 years
    - ☐ 11+ years
    - ☐ Not Applicable
11. Any plot you purchased (or planning to purchase), how long developer will take / took to provide possession? ***(Longest period only)***
    - ☐ 1-2 years
    - ☐ 3-5 years
    - ☐ 5-10 years
    - ☐ 11+ years
    - ☐ Not Applicable

Survey questionnaire complete 2/2

1. What form of real estate you prefer for investment purpose? –
   (Choose one best answer)
   - ☐ Plot
   - ☐ House
   - ☐ Apartment
   - ☐ Commercial (shops etc.)
   - ☐ Anyone with good return potential
2. What form you prefer for your living? –
   (Choose one)
   - ☐ Independent houses
   - ☐ Apartments in low rise
   - ☐ Apartments in high rise
3. How do you prefer to buy property? –
   (Choose one)
   - ☐ Payments by Installment
   - ☐ Payments by full (Upfront)
4. How do you prefer to finance your house construction/buying?
   (Choose as many as applies)
   - ☐ Self-saving
   - ☐ Crowd financing (Committee etc.)
   - ☐ Loan support from family & friends
   - ☐ Bank finance / mortgage
5. What is the best sector for investment or saving purpose? ***(Choose one best answer)***
   - ☐ Real Estate
   - ☐ Bank saving deposit / saving certificates etc.
   - ☐ Stock market / Forex market
   - ☐ Business or Business Partnership

17. How will you choose locality for your own living purpose? ***(rate your preferences)***

Facilities such as roads, water, sewerage etc.	High	medium	low
Distance from school	High	medium	low
Distance from your work place	High	medium	low
Distance from city center	High	medium	low
Land / House price	High	medium	low
Nature and natural landscape	High	medium	low

Glossary

- Urbanization – population migration from rural area to urban area.
- Urban development – social, cultural, economic and physical development of cities
- Functions: Municipality functions include urban planning, land use management, development, community basic services, facilities and creating healthy and safe environment.
- Sprawl: Urban sprawl, urban expansion or suburban sprawl is the low density, car dependent and mono functional expansion of human populations away from central urban areas
- Subdivision: means the division of a lot or parcel of land into two or more lots for the purpose of sale, development or house construction.
- Infrastructure: Infrastructure or Urban infrastructure is capital facilities and structure, systems serving area, city and country necessary for livelihood and economy to function.
- Site and Service: government or private developed lands with basic infrastructure to facilitate private individuals to construct houses.
- Sustainability and Sustainable Development: Sustainability is a state of living that is able to continue for long. The ability to be sustained, supported, upheld or confirmed. Sustainable development is a development to fulfill the needs of present and generations to come. Sustainability is the goal whereas as sustainable development is the path or process to be followed to achieve sustainability.
- Financialization: Financialization is an increase in the size and importance of a country's financial sector relative to its overall economy.
- Plot: In local terms plot refers to individual piece of land for residential or commercial purpose developed by a developer with n a specific sub division with the provision of roads, utilities and sewerage infrastructure. The title of the plot is transferred to

individual owners to build the house or commercial structure as per the owner's needs and priorities within the bylaws of the specified community.

- Society: In local terms, society refers to urban sub division developed under a specific name mostly by private developers authorized by the City government within the specified bylaws and terms and condition.