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COLLEGE OF ENGINEERING

IMPACT ANALYSIS OF SPORT STADIUMS ON PHYSICAL URBAN
DEVELOPMENT; CASE OF QATAR

BY

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ABSTRACT

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Title: Impact Analysis of Sport Stadiums On Physical Urban Development; Case of Qatar

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Sports stadiums are increasingly becoming essential infrastructures of cities, playing crucial role in defining image of countries. Construction of new stadiums within host cities is associated with major ramifications to urban fabric; land value, and livability and vibrancy of stadiums surroundings. Sports stadiums have large-scale necessitate investigation of morphological characterizations of it within host cities, and analysis of physical urban development associated with implanting stadiums to urban fabrics. Research analyses include selecting appropriate location and assessing of adaptability of reutilization and legacy plans of stadiums structures post mega sports events. Aim of this research is to conduct comprehensive impact analysis of sports stadiums in physical urban regeneration and urban development within host cities.

Research explores comprehensive literature review that highlights sport stadium as crucial component of urban fabrics, as well as importance of process for bidding for mega-events which in urban policy are perceived as captivating opportunity for enhancing living quality within urban environment, as they create spectacle' that accelerates investment all around world, and contribute to establishing city identity through speeding up urban redevelopment and growth. Second purpose

of this article is to begin to translate literature on sports stadiums into practical guidelines and frameworks for planning professionals. Hypothesis of research is that sport stadiums contribute positively and impact urban development and regeneration within host cities, as well as is that stadiums accelerate rates of urban development within host cities, more than spontaneous rates of development incase stadiums were not implanted to cities structures.

Research model composed of scientific tools that are used for tracing and assessing urban development within urban fabrics, tailored and modified to measure actual impact of development associated with construction of sport stadiums within host cities. Research also analysis physical aspects of sport stadiums as urban form, and investigate indicators of physical urban development along, with assessment and measurement tools for quantifying rates of development occurring in host cities. Conceptual framework is formed to analysis impact of sport stadium structures on urban regeneration in host cities, particularly case of the state of Qatar by projecting established conceptual framework and assessment tools on sport stadiums built in country preparing for hosting Qatar world cup 2022.

Projecting findings and conclusion of crucial factors that affect physical urban development driven by construction of sport stadiums will establish guidelines and policies to be implemented in future by urban planners and host cities to make most positive benefit of sports stadiums structure. As well as ensuring that stadiums remain insolated, enhancing livability and regeneration within urban fabric. However, results evidence that impact of sport stadiums on urban development of surroundings is highly affected by selection of site location of these stadiums. Results validates that Stadiums should be integrated into city's morphology and transportation systems.

New stadiums should be designed to fit into their surroundings in terms of size, orientation, and shape to ensure that existing movement patterns are preserved, enhanced, or generated.

Keywords: Sport Stadiums, mega Sports Event, physical Structure, urban Development

DEDICATION

This thesis is dedicated to the soul of my father, who has been motivating and supporting me all through my educational journey

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CHAPTER 1: SCOPE OF STUDY

Chapter 1; Study scope defines thesis topic; impact analysis of sport stadiums in physical urban development. Research focuses on sport stadiums as an urban feature, and analysis the morphological characterization of sport stadiums within cities. Topics analyzed include site location, accessibility and legacy plans of sport stadiums post mega sport events. Conceptual framework derived from investigating literature reviews will be applied to analysis and study sport stadiums in state of Qatar. This chapter represents introduction of thesis, problem statement, and importance of the research topic, main aim and objectives, research questions, and the structure and flow of the thesis.

1.1 Introduction and Background

Sports stadiums appear as marginal and specialized type of urban development projects. However in recent years such projects have become significant. As a form of gaining importance, questions related to structures of sport stadiums have become crucial; E.g. Where to build stadiums in cities (Thornley, A., 2002). Both sport stadiums and mega sport events have had significant role transforming cities since ancient times (Horne, J., 2007). Therefore this should influence perception of politicians, administrators, and planners of criticality for planning mega sport events. Transformations in host cities happen in both physical and non-physical ways giving chances to start urban improvements projects. Rapid expansion of planning for mega-event is response to set of political and economic circumstances (Moussa, R. A., 2018).

Significance of mega events is due to large capital investments and administrative skills required for process of hosting mega sport event which

frequently leave lasting impacts on host country urban landscape (Werner, K., Dickson, G., & Hyde, K. F., 2015).

Justifications for hosting mega sport events are numerous; possible future urban redevelopment, regeneration and modernization of built and natural environments, stimulation of economic growth, and development of infrastructure of cities (Chalkley, B., 2004). Despite controversial results regarding of proving ability of staging mega sport events in contribution to development in host country, the interest in hosting mega events is growing rapidly worldwide including the Arabian Gulf region countries (Chalkley, B., 2004). As a result cities worldwide make deliberate policy plan to host mega-scale events such as FIFA World Cup, Olympics and World Fairs, seeking out the benefits associated with host mega sport events; local economic growth, enhancement of city image and tourism and improvement of city built form (E.g. Essex & Chalkley, 1998; Hall, 1996; Paddison, 1993).

Recognition of hosting mega sport events overweigh considering the expected ramifications of events in host countries. Focus of planning mega-event is typically on economic impact including, construction cost of stadiums, new accommodations and the revenues generated - rather than the broader physical and social- cultural implications (Roche, 1992). Examples of major sport events in the history of urban planning include; Olympic Games World Cup, or any large-scale events that draw large spectators from different countries and attract media attention (Roche, 2000).

Construction of sport stadiums that correspond to required classifications is crucial aspect of planning mega sport events (Taks, M., 2013). Cities have continued building sports stadiums despite statics and research proven evidence that they are not economic growth engines they claim to be (Baade, R. A., 1996). Sport stadiums should be pre-planned and well-studied before been implemented to urban fabrics

instead of emphasizing facts that they are poor investments. Impact analysis of sport stadiums by urban planner and scholars should gain concerns, to maximum possibilities of urban development (Crompton, J. L., 1995).

1.2 Problem Statement

Evolution of sports stadiums and cities over previous century has solely been addressed by researchers and scholars and most of existing researches criticizes economic and social aspects (Whitson, D., & Horne, J., 2006). Impact analysis of sport stadiums in scholarly literature published in academic journals is frequently linked to data about economic impact of professional sports on cities (Coates, D., & Humphreys, B. R., 2003). Majority of these studies apply econometric methodologies to examine impact of professional sports on metropolitan economies; adjustments in average per capita income, average worker earnings in various sectors of economy, and employment (Coates, D., & Humphreys, B. R., 2003).

This special issue triggers to advance research agenda regarding physical aspects of sports stadiums in urban contexts. Modern stadiums have become larger in size as result of advancement of technology in building materials and systems of transportation, complexity of stadiums functions fulfill social requirements; entertainment, recreation, and other activities (Real, M. R., & Mechikoff, R. A., 1992). Increasing size of stadiums has presented obstacles for its integration and contribution to the urban fabric. This issue triggers finding solutions to avoid problems associated isolating large sport stadiums structure from the urban context (Preuss, H., 2007). Therefore this research conducts impact analysis of sport stadiums as type of sport facilities in physical urban development.

This research discusses details related to impact analysis of sport stadiums in physical urban redevelopment. Critical analysis has been conducted regarding factors and guidelines that allow integration of sport stadiums with surroundings and enhancement of livability and regeneration within urban fabrics. Evaluation of effect of sport stadiums also involves cost-benefit analysis and streams generated by spillover of activities generated by stadiums.

Academic relevance is represented in eagerness of filling gaps in literature associated with investigating physical aspects of sport stadiums in urban contexts, in addition to formulating concise guidelines that connect theory and practice. Time frame of the research expands from preparing hosting mega sport event to post mega sport event; long term impacts e.g. legacy plans of sport stadiums. State of Qatar represents the case under study, will be first country in region and middle-east having the opportunity to host FIFA World Cup. Further details regarding the existing literature contents analysis about the subjects related to the research is discussed in chapter 3.

Research questions relevant to the topic include: 1) what are the indicators that proves occurrence of physical urban development? 2) How are these indicators related to sport stadiums as an urban feature? 4) Is there is difference in nature rate of development before sport stadiums were constructed and after that? 3) How capacity, site location and accessibility of sport stadiums affect their magnitude in physical urban development?

1.3 Aims and Objective

Aim of research is establishing a framework for assessing and analyzing the physical impact of sport stadiums and the mechanism of how it affects the

development of the urban fabric. This will be encountered through four objectives. Figure below (see figure 1) illustrates aim and main objectives. Section below summarizes different types of objectives in details.

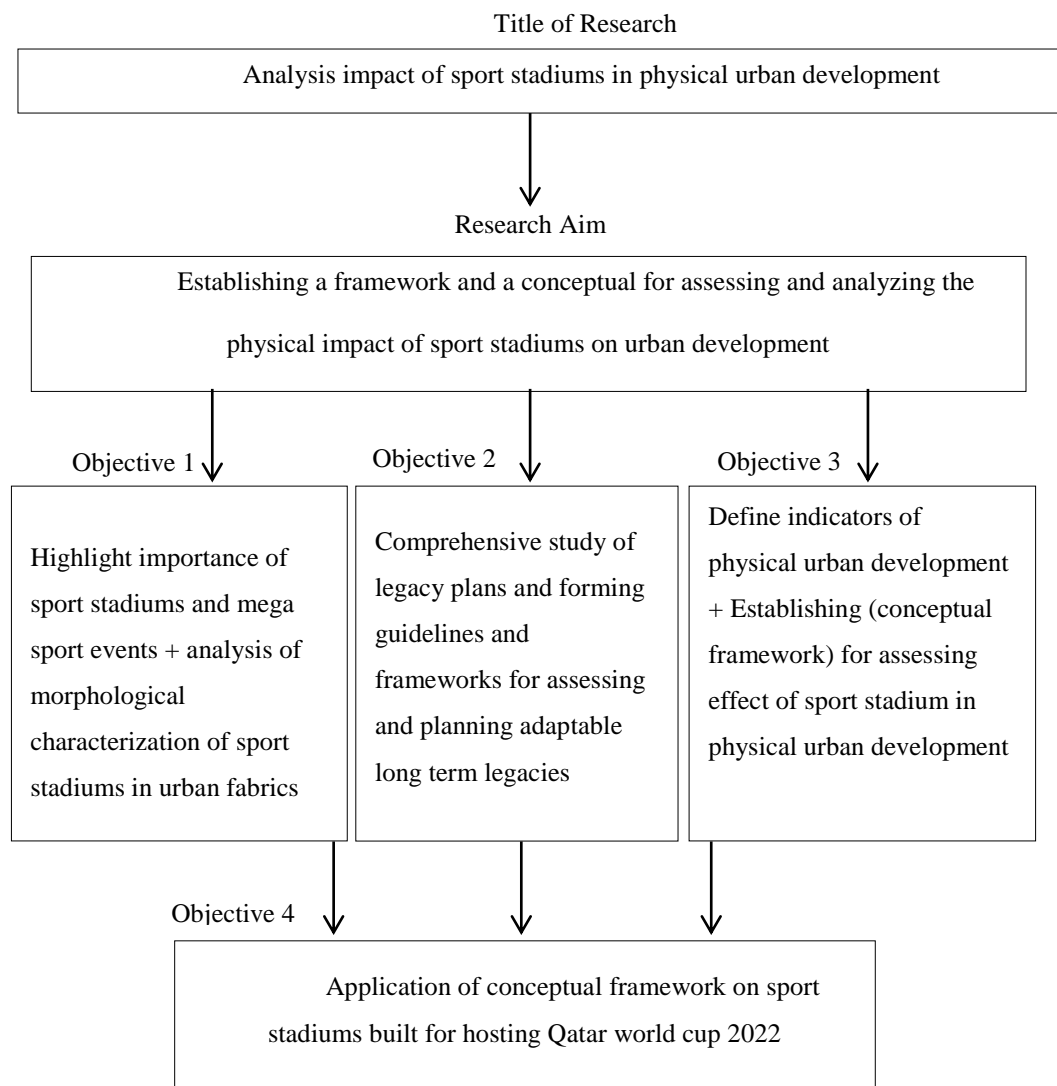


Figure 1. Main goals and objectives of research (Source: established by author)

First Objective: Introduction and highlighting importance of mega sport events and sport stadiums as crucial part of urban structure. Study history of the sport stadiums within the structure of city, from ancient times to nowadays. Research

explores literature review of documented timeline and revolution of sport stadiums through years. This objective intend to define and analysis morphological characterization of sport stadiums within urban fabrics. Research studies theories and conceptual frameworks that allow analysis of physical aspects of construction and designing of new sport stadiums through lenses of urban design and planning.

Second Objective: exploring literature review about definitions of different types of legacy plans, varying structures of mega events and frameworks for formulating adaptable legacy plans that allow integrating sport stadiums into urban contexts, and ensuring the homogeneity of future uses of sport stadiums with surroundings in urban fabric.

Third Objective: defending indictors that evidence occurrence of urban development through exploring theories and literature, and establishing conceptual framework for assessment impact of sport stadiums in physical urban development. Objective also includes detecting differences in rates of physical urban development that occur naturally comparing to development rates after construction of sport stadiums.

Fourth Objective: assessing impact of sport stadiums -built preparing for hosting world cup 2022 by state of Qatar- in physical urban development. This objective applies conceptual framework established in the previous objectives on sample of sport stadiums in state of Qatar. This objective as well studies of impact of sport stadiums after mega sport events through analyzing legacy plans. This includes comprehensive literature review regarding the definition of legacy plans.

1.4 Thesis Structure

This thesis is comprised of six chapters; following section summarizes content of each chapter in details.

Chapter 1; Scope of Study defines thesis topic; impact analysis of sport stadiums in physical urban development in cities preparing to host a mega sport events. Study analysis morphology of sport stadiums related to urban surroundings and investigating legacy plans of stadiums after the mega sport event. Research analysis sport stadiums in state of Qatar using conceptual framework derived from comprehensive literature review. Chapter also covers structure of the thesis, problem statement, research questions and main aim and objectives.

Chapter 2; theoretical background explores collected data and literature related to each objective of research. Topics include study of sport stadiums in urban contexts, introduction to mega sport events, and study of definition of legacy plans after sport stadiums and conceptual framework for formulating adaptable legacy plans. Chapter as well study definition of indicators of physical urban development, exploring scientific tools that allow planners achieve accurate assessment of contribution of sport stadiums in physical development to its urban surroundings.

Chapter 3; outlines research methodologies and justification of importance research. Conceptual framework and theoretical frameworks derived from critical analysis of data obtained from literature reviews are presented. Research tool used for any collected primary data, secondary data in research is summarized. Chapter covers summary of literature review of each topic of research objectives.

Chapter 4; covers state of Qatar, case study associated with research through analysis and study of sport stadiums in country. Chapter also covers country general data and history of mega sport events. Chapter covers study of structure of urban

context and analysis of morphology of sport stadiums in country by using conceptual framework and frameworks obtained by research. Research conducts site and accessibility analysis of sport stadiums located in different provinces of host country, and highlights potential locations for sport stadiums built in future.

Chapter 5; summarizes discussions of results conducted by analyzing case studies. Findings and outcomes are logically generated forming guidelines and policies that contribute to future studies of e topic. Figure below illustrates structure of thesis and content of each chapter Figure- (see figure 2) below illustrates general structure of thesis and flow study.

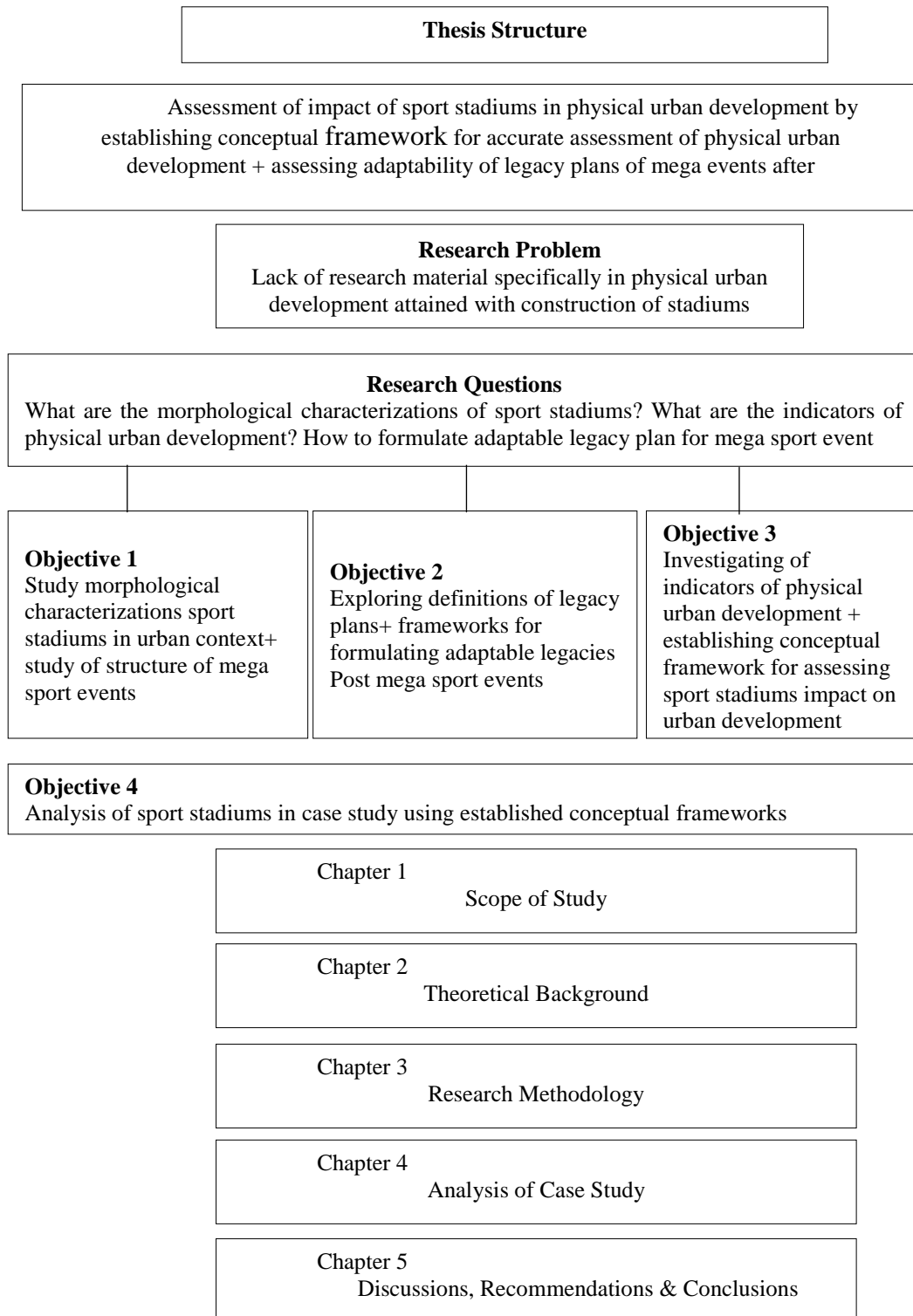


Figure 2. Structure of thesis and research flow chart source: (established by author)

CHAPTER 2: THEORETICAL CONTEXT AND BACKGROUND

Chapter 2; explores comprehensive literature review of each objective of this research. Subjects include theories and definitions of morphological characteristics of sport stadiums as urban feature, study of sport stadiums within urban fabrics in variety of physical dimensions, including history and construction revolution of sport stadiums in cities, site location and accessibility analysis. Chapter also explores definitions and theories regarding indicators of physical urban development, and tools used for impact assessment of sport stadiums in physical urban development.

2.1 Sport Stadiums as Urban Features

There are various literary sources accessible that detail stadium design and construction, as well as the growth of such variables throughout history (Chalkley, B., & Essex, S., 1999). However, not all sources agree on certain facts or points of view, thus a literature review is important to identify any points of controversy and make any appropriate comments on the arguments represented.

There is also a notable absence of literature that covers the scope of studies that this thesis will investigate. There are a variety of sources for components of the information described here; including ancient stadiums, modern stadiums, and design guidelines, but there is no unified point of reference for the historical evolution of stadium design and implementation throughout history (Liao, H., & Pitts, A., 2006). This research will seek to address this by conducting study that will allow readers to comprehend history of stadiums, as well as provide knowledge into sport industry potentials from an urban planning perspective.

2.1.1 Origin of Sport Stadiums

First stadiums appeared in history in conjunction with the 'stade' footraces. The actual date of the initial stadium is unknown, although the overwhelming consensus is that it was built about the 8th century BC (Welch, K., 1998). Stadium was established in 776 B.C. in ancient Greece, according to legend and history. City of Olympia is credited with establishing first stadium. Stadium was formed like extended 'U' or crescent, and it was long and thin to fit 'stade' event, with starting line on one end and finish line on other. Rock structure was built alongside track as way to separate place for judges (known as the 'exedra') (Swaddling, J., 1999).



Figure 3. From the left 1) Stadium at Olympia 2) site of Hippodrome in ancient Greek city
Source: (Sellies, 2006; Olympia Greece, 2009)

Figure above (figure 3) displays. Figure 3.1 shows a stone stand, or exedra, for judges in middle of stadium length, offering an exquisite viewing area for them at both ends of track, marble slabs were installed to symbolize the start and finish places of stade footrace events (Ryan, G. E., 2005). As popularity of events grew, embankments were adjusted to accommodate more spectators in mud sitting areas. At

its highest capacity, stadium was expected to accommodate up to 45,000 people (Spampinato, 2012).

Athletics grew in popularity in ancient Greece, prompting construction of stadiums in other empire towns. Besides these stadiums for 'stade' (footrace) events, additional Hippodrome arenas were built (Baade, R. A., & Matheson, V. A., 2014). Horse racing, or more specifically chariot racing, was main focus of this ancient Greek renovated stadium.

Stadiums have evolved significantly from their modest beginning as plain grass fields with spectator hills and terracing (Egge, R., 2006). They are a catalyst for how stadiums are planned and operated now, and many of these ancient and pioneering practices and ideas are still in use in another form or another today. Ancient Roman Empire had a significant impact on modern-day stadiums, particularly in terms of how they run, and this legacy will go on through the evolution and reinterpretation of many of the ideas pioneered by these stadium pioneers (Polley, M. (2012).

2.1.2 Development of Stadiums as Building Types

Advances in technology played a significant impact in evolution of arenas, as evidenced by Sheard's five-generation theory (Sheard, 2005). Aside from fulfilling humans' needs, advancements in building materials influenced arena growth. For example, adding roof to arena improved its weather resistance; nevertheless, original requirement for roof arose when seating has taken the place of previous terraces. While seating required significantly more room, larger roof was required to support structure and offer shade (King, 2010).

Furthermore, advent of new modes of transportation has increased number of options available at various stadium locations. Development of arenas as building

type has also been influenced by site selection decisions. There are three primary locations for sport stadiums sites (Suzuki, H., Cervero, R., & Iuchi, K. (2013) :

1) Urban locations, Stadium developers may encounter space constraints and higher cost in urban areas with advanced transit networks.

2) Semi-Urban locations this could result in a slightly lower price but more area for other improvements, such as parking spots.

3) Greenfields locations where land costs are typically lower but larger expanses are accessible, yet it is typically associated with a weak transit network.

On one hand, new stadiums developers may prefer semi-urban locations due to their capacity to accommodate accessibility and larger developments; on other hand, urban and Greenfield sites locations might act as stimulus for urban regeneration.

2.1.3 Historical Background of Stadiums and Cities

History of integration of sport stadiums into urban fabrics reflect many improvements and progress through time. Stadiums development According to (Sheard, 2005 & King, 2010) can be divided into three phases: 1) Ancient Stadiums, Romans and Greeks era, 2) Modern stadiums, renovation of stadiums in Europe, and 3) Post-modern stadiums, stadiums developed as stimulus for urban redevelopment.

High demand for construction of new sport stadiums has grown steadily over last couple twenty years. Growing market of stadiums construction is related to change in perception of sports, from being considered recreational activity to being evaluated by contemporary communities as important social and economic engine (Rafoss, K., & Troelsen, J., 2010). Sport represents major global industry with huge economic effect on different spatial scales, as well as tool to counter social problems such as inequality, deprivation and violence in urban realms.

2.1.4 Development of Multi-Purpose Stadium

Olympic Stadiums remained largest venues in most cases after separation of facilities for swimming, equestrian and cycling events. They hosted sport competitions as well as opening and closing ceremonies. Following the Olympic Games, the field is frequently utilized for Football, cricket and rugby, hockey, and other non-sporting activities such as concerts (Hock, C., Ringle, C. M., & Sarstedt, M., 2010). Berlin Olympic Stadium, which was established between 1934 and 1936, is one example of a multi-purpose stadium. It was introduced by architect Werner March for 1936 Berlin Olympic Games. His father Otto March built the National Stadium, which was demolished to make way for the Olympic Stadium (GOLD, J. R., & GOLD, M. M., 2012). On December 1933, Hitler personally requested on third design by March brothers naming it 'solution option B.'. However, completing out this plan necessitated evacuation of National Stadium. Multi-purpose stadium have continued to develop and be considered by host countries who has visions to host single sport events, as this allow for extending of validity of structure being utilized after mega sport events ends (Lienhard, P., & Preuss, H., 2014).

2.2 Introduction to Mega Sport Events

2.2.1 Profile of the FIFA World Cup

FIFA World Cup is considered largest prominent single-sport event. Every Four years tournament takes place. This sport event is specialized in world international football (Horne, J. D., & Manzenreiter, W., 2004). Staging FIFA World Cup, requires major investments in infrastructure, stadiums, and transportation with handling capacity allow millions of people (both worldwide and provincially) to access matches while adhering to the protective measures in terms of health and safety and recruiting and training thousands of volunteers (Preuss, H., 2007). Host

countries should be aware of planning to minimize waste in stadiums after mega event ends.

2.2.2 Growth of Awareness in Planning for Mega Events

International Sport Governing Body (ISGB) uses logical decision theory to explain the variables it considers when determining which city or country has submitted the best bid to host the next big event. However making decisions upon selection of hosting countries based on accuracy of their bidding process is complicated mission (Preuss, 2000). Rapid pace of life places strain on ISGB board members to learn from prior Games' criticisms. For example, International Olympic Committee (IOC) eliminated amateur sections from its Olympic Charter in order to avoid repeat of financial crisis of 1976 Montreal Games, establishing path for globalization of Olympic Movement.

As result of IOC's focus on soliciting donations for the Movement, cultural events and the environment were disregarded (Horton, P. 2010). Equilibrium was restored in 1994, when IOC president Juan Antonio Samaranch said explicitly that culture and environment were foundations of organization's future activity (Kidane, F., 1997; Chappelet, 2008). Currently, the IOC is conscious of these foundations, having received criticism for the environmental pollution and damage caused by the Olympic Winter Games in Albertville in 1992 (Bayer, S. 2006).

Despite significant controversy over extent of environmental damage caused by Lillehammer Games in 1994 (despite fact that event organizers had concentrated on environmental conservation), these Games paved the way for the establishment of sustainable Olympics (Haugsjaa, S., 1997). Furthermore, the 1993 IOC representatives' choice of Sydney for the 2000 Games may have been influenced by the Green Games idea, which has served as a guideline for all Olympic Games since

its inception. IOC's environmental policies were launched with Lillehammer and Sydney Olympics (Lenskyj, H., 2000).

2.2.3 Requirements for Mega Events Host Cities

World Cup is privilege that many countries compete for it, despite of drawbacks and high cost of mega events with no assurances of financial gains. Countries willing to host World Cup must meet FIFA's infrastructure standards and guidelines (FIFA is world's governing body of football) (Zimbalist, A., 2016). All structure of events including; Stadiums, accommodations, transportation systems, communications, and electrical systems all have minimum requirements. 70% of the bidding process is based on having existing infrastructure or developing plans and obligations to ensure that all requirements are fulfilled. Section below is review of standards required for each structure of sport events (Gaffney, C., 2010).

Table 1 . Standards required for each structure of sport events source: (FIFA guidelines)

Event Structure	FIFA Requirement	Extra details
Stadiums	12 stadiums	capacity of 40,000 – 80,000 availability of training site in each stadium
Transportation	Airport approximate to stadiums	1,450 passengers per hour endurance
Accommodations	72 base camp hotels 1,760 – 8,080 hotel rooms	for teams and referees in each host city

Stadiums: One of most expensive parameters of hosting World Cup is stadium building and refurbishment (Gaffney, C., 2010). Existing stadiums in most regions are concentrated in metropolitan areas, however FIFA encourages that stadiums be distributed around the country (Baade, R. A., & Dye, R. F., 1990). As result, many new stadiums are built in smaller rural areas that may or may not have football team

that will use stadium in future, as well as these developing communities will face more difficulties to sustain such large-scale stadium building in long run. Stadiums are costly to build and operate, take up valuable real estate (since they must be near the city center), and are complicated and expensive to maintain later (Li, Y., Crandall, D. J., & Huttenlocher, D. P., 2009).

Transportation: Countries must be prepared to handle a temporary rise in demand in cities all over the country, including airports, passport checks and immigration inspections, runways, fueling stations, and highways going into and out of airports (Preuss, H., 2007). Structures such as terminals are sometimes designed with the goal of being temporary, as the flow of tourists is only expected to last a short time. There must be a considerable system in place to properly transfer tourists from the airport to the stadium, including rail lines, buses, and taxi service locations. Even though these systems will conveniently transport tourists from transit nodes to stadiums, problem will be in forming infrastructures that continue to serve cities for long terms (Humphreys, B. R., & Prokopowicz, S., 2007).

Accommodations: Hotels should be able to accommodate massive spikes of both international and domestic fans. Hotels should be adequately connected to means of public transportation and located with approximate to main airports and stadiums locations (Whitson, D., & Macintosh, D., 1996). FIFA highlights importance of providing different prices and rates for rents as well different types of accommodations e.g. hotel rooms, serviced apartments.

FIFA standards should be considered during the bidding process and early phases of preparation for mega sport event hosting, and should be followed throughout creation process (Preuss, H., 2007). Stakeholder participation is encouraged to make the process more transparent and to relieve worries that

stakeholders may have about organizing a mega-event in their region (Ma, S. C., 2011).

2.2.4 Comparative analysis of Mega-Events impacts

Urban dimension of mega-events has been analyzed in first studies (1990s) (e.g., Hiller, 1990), despite of that, study of urban impacts of mega-events has only been common in 1990s. Available literature is repeatedly criticized for generating "less analysis beyond description" (Long, 2015). More comparative analytical researches should carry out and considered by scholars to enrich parameters and frameworks that assist in investigation of impact of mega-event (Roche, 2006). Limited researches have been focusing on exploring impacts of hosting mega events in chronological order (Chalkley & Essex, 1999; Liao & Pitts, 2006).

Most researches and studies commonly provide inconvenient assessment of major improvements associated with hosting mega events. Mostly the Summer Games (when related to Olympics events), within event taking center of study focus of rather than all other of activities and patterns associated with hosting events and processing through it. When explicit comparative analysis work is preformed, it is frequently done with focus on region (Andranovich, G., 2001; Burbank, 2009; Maharaj, 2015, on Global South), or focuses on specific industry, such as infrastructure (Kassens-Noor, 2012).

Conducting researches based on comparative analysis is not precise to be relied on because It introduces a more methodical description of mega-events' urban implications around world. It is preferable taking account for how regional consequences of mega-events in particular countries are bonded to Flows of regulations, technologies, concepts, and communities around globe, which express and communicate only their skills and best practices, standards, or employing

directors and consultants with prior mega-event planning experience (Allen, J., & Cochrane, A., 2014).

Barcelona as case study is well-publicized and well-known a practical example of how planning skills may help from one mega-event host city has been assembled and distributed to other destinations, including Olympic host cities like Rio de Janeiro (González, 2011). This indicates high rationality associated with sports mega-events investments hosted in cities that always relate to other locations, in such cases proposing comparative study as a viable technique.

It is important to recognize that comparative research over wide range of geographical, financial, and sociocultural context is loaded with complexity, flaws, and inconsistencies. It's also accurate that the consequences of mega events follow irregular spatial variability, and that theoretical context of mega-event makes cumulative assessments less applicable (Blosser, P. E., 2009). Nonetheless, this study should be viewed as significant step toward building comparable analytical framework for cyclical mega-events that will remain to have influence on cities around the world.

2.2.5 Mega Events as Urban Catalyst

Pivotal key motives that hype cities to bid for hosting mega-events are potentials for of stimulation effect of sport stadiums in acceleration pace of urban growth. Preuss (2004), stated in his researches related to impact of mega events that; Olympic Games can boost development of city infrastructure by up to ten years. Mega-events, on the other hand, have been found to draw policymakers' attention to new programs rather than act as catalyst for current plans in host cities, according to some authors, promises mega events claim to deliver regarding leveling up rates of urban developments may not always be considered rational (Kassens-Noor, 2012).

Evidences for Olympic Games in London, Vancouver, and Sochi serving as catalysts are unclear. However in each case of the previously mentioned host cities, event aided in acceleration and concretization of existing urban development plans, as well as attracting additional resources from national and/or provincial governments that would not have been obtainable otherwise (Vainer, C., Broudehoux, A. M., Sánchez, F., & de Oliveira, F. L., 2016).

London is most evident example of host cities benefiting from Olympic Games as catalyst for urban development. 2012 Olympic Games were integrated into existing urban redevelopment scheme in East London, and national government provided financial assistance for rapid redevelopment of the Lower Lea Valley (Poynter, 2009).



Figure 4. Aerial view of lower lea valley London before and after Olympic 2012 Source: London Legacy Development Corporation

Vancouver hosting of event has amplified construction of rail link between airport and city center, as well as the renovation of major roadway connecting Vancouver to mountains and expansions of convention center (VanWynsberghe, 2014), all of developments mentioned above had been on stressed out in bidding and

pre planning process reports before event started (Chan, 2013). Interventions, on other hand, were more chaotic and lacked overall coherence of London's master plan.



Figure 5. From the left 1) The Canada Line 2) Whistler Olympic park 3) The Olympic Village mega projects in Vancouver after 2010 winter Olympics Source: (islandpress.org)

Sochi used Olympic Games to ensure accomplishing governmental target programs for infrastructural renovations in area, noting that government had set development plans in place before bidding process was carried out (Müller, 2014). However, in each of these three situations, events also added new components to urban development strategy, most notably sports facilities, acting not just as stimulus but also as means of diverting resources to new projects.

Regeneration of Brownfield or neglected metropolitan areas is major motivator for mega-event bidders. The International Olympic Committee (IOC) even advocates the use of the Olympic Games for community development as they state: “Games may serve as a stimulus for the development of new urban districts on industrial land areas, abandoned docks, or abandoned railway yards, in addition to rejuvenating current metropolitan areas” (IOC, 2012).

Practice of linking urban redevelopment to staging of events has become so widespread that experts are now considering event-led rejuvenation as special category (Smith, 2012). Degree to which urban redevelopment was a priority of hosting the event different ways and forms in the cases cited in previous section. On another hand, London and Rio de Janeiro both host cities had renovation visions and development ambitions as prime motivation for hosting event. Section below reviews different development projects carried out in hosting cities mentioned above, which assert fluctuation in level of urban development impacts achieved by each host city.

Only Olympics, according to London governments' claims, have potential to change one of country's most inhabited places for centuries to come." (London Bidding Committee, 2004), representing the Lower Lea Valley as an underutilized, impoverished area suitable for redevelopment (Raco & Tunney, 2010). As process of prepare for hosting World Cup and Olympic Games, Rio de Janeiro launched major pacification and resettlement campaign for urban slums, or informal communities (Freeman, 2012; Gaffney, 2016) which could count level of development in city fabric. In addition city has begun grandest redevelopment project in city's history in historic port area (Sánchez & Broudehoux, 2013).

Primary motivation for hosting Olympics in Sochi and World Cup in South Africa was to develop new infrastructures and stadiums, generally on Greenfield property, rather than converting Brownfield regions or enhance impoverished communities (Maharaj, 2011; Müller, 2014). Finances in these two situations were dominated by the development of new sports facilities, buildings, and urban transport systems. Experiences above stress out importance of focusing in enhancement of underdeveloped areas within host cities, rather than seeking out implanting new structures to urban context.

World Cup in Brazil and Vancouver are in middle of range in terms of level of development occurred post hosting mega event. There was large rehabilitation as well as major new structural components added to cities in each example. Olympic Village in Vancouver was utilized to not only restore industrial waterfront wasteland, but also to expand infrastructure, such as a public transport connection to the airport (Van Wynsberghe, 2014). Infrastructure development and new stadium building established for preparing to host world Cup in Brazil allowed for extension of real-estate vectors in So Paulo, Recife, and Natal; hosting cities in Brazil (Gaffney, 2015).

High expectations of positive impacts of sport stadiums on host cities, according to critics, are based on (Gratton and Henry 2001; Davies 2002) upon incorrect multiplier assumptions, substitution underestimation effects and exclusion of opportunity costs are two of the most common mistakes made by economists (Baade 1996; Noll and Zimbalist 1997; Rosentraub 1997, 2000; Zaretsky, 2001). Ex-post econometric analysis has long backed skepticism about new stadium construction's economic benefits, few positive and often negative effects on wages (Baade 1988; Baade and Dye 1990; Coates and Humphreys 1999), provision of jobs (Baade and Sanderson 1997), and wages (Baade and Sanderson, 1997) have been documented (Coates and Humphreys 2003). Siegfried and Zimbalist (2006) go into great length about why sports facilities haven't been able to boost local economies.

2.3 Location of Sport Stadiums

Section below includes literature review regarding site location of sport stadiums within urban fabrics. Comprehensive literature reviews have been conducted in subject's related crucial criteria affecting decision making of choosing appropriate stadium locations. Importance of stadium site selection and influence of locations in role of sport stadium in physical urban development is highlighted in this section.

Location selection theories have been handled in many researches and literature content many theories related to choosing appropriate site locations, but none of them appears to be an influential in field of structures of sport stadiums (Scott, 2000). Lack of defined frameworks regarding selection of location, encourages carrying out more investigations about stadiums locations specially and use results to form concise conceptual framework and guidelines for choosing optimal site locations. Summary of several approaches related to location theories is provided below, including the recommendations in the guidelines reports of FIFA.

2.3.1 Spatial Changes of Sports Stadiums Location

Variations of sports stadiums location has been occurring over twentieth century as result of constant changing in factors affecting choices of locations (Preuss, H., 2015). Multiple waves of potential location choices and selection factors during last century should be studied to understand how these factors are adapting to changes in both physical and non-physical structures of cities (Larson, M. S., 1995). Table below reviews common locations of sport stadium during different periods of time along with different factors of locations selection. Table below- table 2- summarizes changes in site location of sport stadiums through different periods of times.

Table 2 . Changes in site location of stadiums during twenty century Source: (Chapin, 2000)

Period of time	Common location	Location selection factors
1900-1950s	low dense areas little development	Land cost Accessibility surrounding neighborhood Availability of space for future expansion. proximity to the fan base
1950s- 1970s	suburban areas	Easy access (upcoming of automobile) The location mirrored the core market
1980s-1990s	The City Centre	Re-develop downtown areas Enhancing the urban experience and civic pride Minimize the construction costs

Evolution of locations choices over twentieth century reflects shifts in significance of location selection variables (Foster, D. R., 1992). Until the 1950s, three primary location variables were considered by team owners; inexpensive land, accessibility and proximity to fans base. Location variables mentioned above were still considered as primary location factors throughout 1950s and 1960s. In 1980's criticality to keep construction costs as low as possible was defining location selection factors. Government has started considering high cost of land and limited accessibility, and decided to improve downtown areas by building new sports stadium (Rosentraub, M. S., Swindell, D., Przybylski, M., & Mullins, D. R., 1994). Return of U.S. sport stadiums to city center represents rising impact of public sector. Until the 1980's also, key financiers of sport stadiums were private investors who tried to keep costs as low as possible. Upwards of the 1980s government who owns unlimited amount of capital compared to private investors, has become biggest funder of sport stadiums and their aim was to develop downtown areas (Fama, E. F., 1980).

2.3.2 Sport Stadiums Locations Theories

Sport stadiums location should enhance consumer experience, and allow stadium to contribute optimally to improvements of the urban context (Santo, C. A., 2007). Below are some theories about different types of stadiums locations within city structure.

1) **Urban:** integration of sport stadiums into urban fabric represents this location type. It is frequently on small site with limited access, close to services and transportation, and stadium's host community is vital component of its urban surroundings. Smaller site footprint means considerably higher physical structures of stadiums, which results in enhancing of visual impact converting stadium into city landmark. Active frontage on ground floor characterizes stadiums in urban locations

which results in conventional, vibrant streets. Flexibility of stadiums structure allowing utilization on non-match days and other large-scale events provides opportunities for conference and venue business and thus prevention of turning stadiums into underutilized structure that burden urban fabrics.

2) Sub-Urban: 'pavilion' stadium is distinguished being located on parking lot island with low-grade landscaping with lack of connection to public transportation. Unprofitability of operating on non-match days makes sub-urban stadiums only function on high-volume match days. Events are primary reason people come to stadium site, having active facades of stadium edge is not feasible. Limited integration with surroundings one of issues associated with these types of sports stadiums resulting in limitation of non-match events. Lack of community integration and place-making also results in absence of natural monitoring and thus decrease buildings levels of security. examples of sub-urban sport stadiums; Petco Park, located on US outside of San Diego's downtown region, and Fedex Field, around 15 kilometers from Washington's CBD see figure below (figure 4).

3) Peri-Urban: Stadiums in these places are typically deprived from fans supporting bases. These stadiums are usually built exclusively for important international events and large-scale events. Utilization of stadiums post events is likely to be far less than anticipated, and many of these stadiums have turn into "white elephants" and unutilized outside the game days, which is costly to host country financially and environmentally, as well as source of accumulation of arbitrary economically deprived groups. Figure below (see Figure 4) illustrates different types of stadiums location within cities.

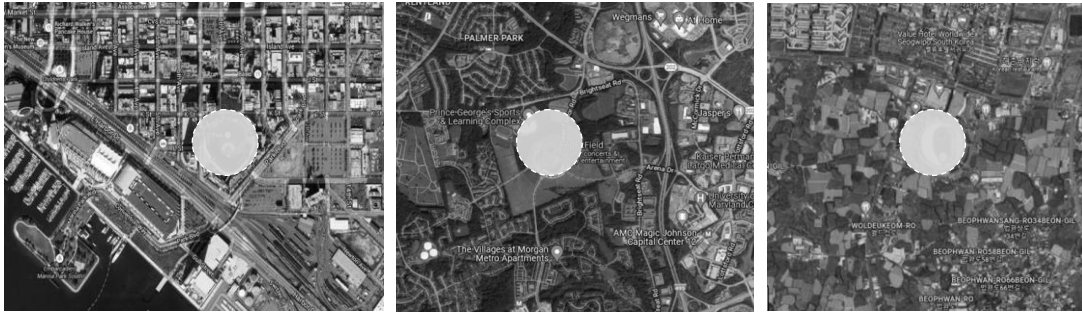


Figure 6: Types of stadiums locations 1) Petco Park, 2) Fedex Field Washington CBD, 3) Jeju Stadium Jeju island source: Google areal maps edited by author

Structure of host cities and how main centers boundaries defines type of sport stadiums location. Measures are often related to distant from main urban centers and downtown as well approximate to international hubs and airports. However classification of parts of urban realm differs from country to another due to contribution of other variables. Nonetheless, much of literature suggests that sports facilities should be constructed outside the city center unless there are advocates for building sports stadium in cities centers.

It should be mentioned as well that research has various categorization for sport location types due to unavailability of unified theories in scholarly that is specialized in sport stadiums as building type within city context. Further detailed justification for this is claimed as well in research tools and approaches section.

2.3.3 Location Factors for Sports Stadiums

Fundamental factors of location selection are attendance, revenue, and occupancy, this include types of buildings as convention centers, sports facilities, or entertainment complex (Petersen, 1996). Scale, exposure, and shape, as well as parking and transit accessibility, are all crucial location selection factors sated by Petersen. Property values, land availability, and land use regulations are also main

factors of location selection (John and Sheard, 2006). Literature suggests that site characteristics such as size and cost of land, vacancy, and transportation costs are major criteria of location selection for sports stadiums (Kotler, P., 2002). Research explores and analysis location selection factors mentioned in literature related to sport stadiums. Section below is a detailed literature review regarding different factors that affect location selection mentioned in scholarly, with focus into physical effect.

Infrastructure and Transportation: Approximate to main public transportation stations increases feasibility of sport stadiums buildings. Another alternative is connecting sports stadium with transit transportation systems e.g. tram or metro that will be decrease the cost of providing expansions of main public transportation lines (Chalkley, B., & Essex, S., 1999). High expenses associated with providing adequate public transportation possibilities should trigger sports teams considering and prioritizing locating sports stadium within sites where public transportation facilities already exist (Coffel, K., 2012).

Highways have been a viral option for sites locations over last decade, evidenced that many sport stadiums have been constructed along highways. High accessibility to highways enhances accessibility sports stadiums. Essentiality of locating sport stadium approximate to highways is determined by a sports team's market potential. Sports teams with more market potential larger market area prefer constructing sports stadium near highways due to potential advertising and marketing opportunities provided in approximate to highways. Minor sports teams with limited commercial potential, on the other hand, has no need for locating sports stadiums near motorways.

Parking facilities increase levels of accessibility of sport stadiums as a consequence of increased use of automobiles over the last few decades. Growth in numbers of private cars users makes it important to provide tourists with sufficient parking spaces. Parking facilities could cost large amount of money due to high value of land in some site locations areas. Outside of city center in this case is considered feasible site location option, where land costs are lower and larger areas of vacant land are accessible.

Natural elements, such as proximity to water bodies, are also likely to play crucial role in establishment of high-quality living places e.g. lakes and rivers. Proximity to community facilities, such as playgrounds, schools, and public services infrastructure, are also critical site location features (Dubin and Sung, 1990; Tu, 2005).

Size and Capacity: Stadiums sites size varies significantly depending on nature of projects. However, depending on stadium's capacity, there are minimum size requirements. Table below reviews several ranges regarding football stadium's typical footprint related to stadiums capacity. Allowance for extra land for parking or other supplementary facilities in these standards is unauthorized. Table below– table 3 - below summarizes average required footprint of land required for different sizes of sport stadiums.

Table 3. Average required footprint for a stadium development Source: (Advisory, K. S., & Von Gerkan, 2013)

Stadium scale (seats)	Average recommended surface area (sq. m)
Massive (60-80,000)	60,000 – 65,000
Medium (20-40,000)	35,000 – 40,000
Large (40-60,000)	45,000 – 50,000

Structure of Urban models: Urban structure model analysis of host countries considered mandatory to decide selections of site locations. As mentioned above in types of site locations within cities, that definitions of urban centers and sub-urban areas highly varies from country to another depending on models of urban structures, main focal urban spots, city fabric growth directions, development plans, and future visions of each. Section below discusses different urban realms models that have been mentioned in scholarly.

Urban geography reviews models of cities structures as a description of geographic distribution of certain locations in cities. Since 1923, five models were developed and are currently being applied to investigate structure of cities. Following are five models not in any sequential manner: Sector model by Homer Hoyt 1933, multiple nuclei model by Harris and Ullman 1945, and urban realms model by James E. Vance Jr., 1964 concentric zone model by Ernest Burgess 1925, and Galactic model by Harris 1960.

Urban realms represents last model established in 1964 to assist characterize current metropolitan regions in United States. Urban sprawl, or unregulated expansion of urban areas, is condition that has started disrupting United States, resulting in issues like rising numbers of automobiles, migration from city to countryside, and

sabotaging of urbanized places and habitat, As result of this, urban realms model was developed.

Intangible profits of stadiums location: Intangible benefits of sports stadiums and creation of activities around sports stadiums are listed on factors for site location selection. Sport stadiums ability to attract new non-stadium-related business activities were investigated, but no positive link has been found between stadiums and general prosperity in economic activities (Baade and Dye, 1987).

Insignificant impact of sport stadiums on metropolitan region's income level had been stated by Coates and Humphreys (1999). Evidence of this insubstantial influence of stadiums in income levels and economic vitality is proven by estimations that building new stadium decreases per capita income of a city by \$10. However, compensating differential effects can reflect this loss, due to presence of modern facilities, such as new sports stadiums, thus people could tolerate lower salaries.

State employment in leisure and recreations and the city share of it could decrease due to construction of new sports stadiums Baade and Sanderson (1997). New sports stadiums boost retail sales in metropolitan regions, but because retail sales only represents small portion of total revenues of metropolitan regions income, not enough to stimulate growth of regional revenues (Baade and Dye, 1990).

Land Costs and Real Economic Factors: Cost of sports stadium building is heavily impacted by site characteristics and economic factors. Cost of land varies depending on site location in city, and it is crucial factor in deciding where to build stadiums. City centers have higher Cost of land rural areas (McCann, 2001). As a result, it's crucial to explore literature and scholarly regarding various degrees of land costs in cities, for example Von Thünen (1826) was first to present an economic model of spatial organization, model represents fundamental analytical tool of

relationships between production, distance and markets. Von Thünen's key point was that identical tracts of land might be used for various purposes based on their market accessibility.

2.3.4 Site Accessibility of Sport Stadiums

Accessibility is one of primary factors influencing site location criteria (Petersen, 1996). Improving of this factor requires evaluating levels of accessibility to suggested site location. Accessibility is influenced by availability of public transportation, highways and parking facilities. Accessibility to public transportation is crucial factor in choosing site location for sports stadium (Bhat, C., Handy, S., Kockelman, K., Mahmassani, H., Chen, Q., & Weston, L., 2000). During tournaments or sporting events, several users are attracted to sports stadiums that necessitate well-functioning public transportation system to cope with large number of people who attend sporting events (Pillay, U., & Bass, O., 2008).

Accessibility is identified as level of easiness and convenient to reach various locations, it also represents as feature of place that describes how general public can access destinations easily (Schwanen, Witlox, & Maeyer, 2010). Individuals' ability to engage in out-of-home activities to obtain daily fundamental living activities is crucial, therefore accessibility is necessity, but not prerequisite for increasing people freedom of choices, and ensuring equal access to jobs, healthcare and education facilities (Lucas, 2012). Another definition of accessibility is " level of ease specific destination can be reached from a given origin or set of origins" (Simmonds et al 1998, as quoted in Halden, Jones and Wixey 2005). Definitions above have all stated accessibility as level of easiness and convenient of reach-ability to different

destinations, which highlights three most important factors that should be defined when analyzing accessibility of certain site locations; number of users that could reach out for site location by means of public transportations, availability of stations of public transportations within walk able distances from site locations, or provision option of transit transportation mode.

Measure of level of accessibility as location selection factor could be captured using number of distance factors that represent mobility and proximity to sport facilities.

Most essential accessibility metric is distance to CBD, following (Von Thünen and Alonso, 1964). Distance to CBD is mainly approximation, meaning accessibility can be influenced by degree to which local transportation infrastructure is built.

Gatzlaff, D. H., & Smith, M. T. (1993) stated that Public transit network availability affects prices of land, through location proximity levels to metro and railway stations (Bowes, D. R., & Ihlanfeldt, K. R., 2001). It's also worth noting that railroad noise, which is commonly linked with public transportation, has detrimental influence on property prices (Cheshire and Sheppard 1995; Debrezion et al. 2006); this emphasizes significance of establishing buffering spaces between sites and above-ground railways. Accessibility analysis conducted in this research includes assessment of level of reach-ability to each sport stadiums in case study state of Qatar, investigating factors outlined from definitions mentioned above.

2.3.5 Importance of Stadiums Locations in development

Stadium location must provide marketable environment for commercial developers. Isolated sport stadium has no potential link to surrounding, thus establishing markets, and commercial investments is unlikely to be developed. Level

of connectivity represents key component of development that results in widespread urban regeneration. Developers must assess their ability to "create place" when considering investing in developing market. Hael et al. (2001) states "surroundings design that offer customers and users with strong sense of place, contributes significantly to location development and distinctiveness". Developers should additionally consider following factors: natural attractions; such as water bodies or parks, complementing attractions; such as monuments, museums, or theaters, public transportation; such as metro and bus stops, as well as more developed submarkets (Shropshire, Kenneth, 1995). In order for urban area to become more vibrant, it must have sufficient access to adjacent attractions like those listed above. Finally, developers must guarantee that renters would be eager to relocate to new developing markets or, more particularly, properties under planning. Concern is same when contemplating residential product for sale.

Adequate returns on investment that could be obtained in locations should be overlooked by developers, so they convince rentals profitable investments. Quantity of urban land that may be available to stadiums buildings is limited in most modern cities. In many circumstances, subdividing land and using it for office building or other common commercial purposes might increase its value. As result, most cities strive to integrate stadium development into a bigger strategy to regenerate specific section of city that may be unable to develop without stimulus or anchor. New sports venues generate complementary businesses such as restaurants and retail, which are frequently drawn large crowds to neighborhoods and thus maximizing profits. Such infusion of extra services and businesses in other blighted regions can promote construction and renovation, job growth, and increased tax revenues.

2.3.6 Summary

Location variables have shifted in development of location selection decisions over last century. Until the 1980s, land costs were most crucial geographical criteria. Governments, on other hand, desired to revive downtown districts in 1980s by building new sport stadiums, despite high value of land and limited reachability. Location theories such as neoclassical theory, behavioral theory, and institutional theory support location considerations such land pricing and accessibility.

Neoclassical theory serves as baseline, while behavioral theory's empirical value is recognized. Urban structure is viewed as dependent agent who must negotiate with its suppliers under institutional theory, rather than active decision agent. These theories about location are important because they apply to sports venues. Location hypotheses are linked to land prices, relocation expenses, and sport club bargaining strength. Attendance, income, and occupancy are all influenced by location variables. Land expenses, market potential, stadium size, and accessibility are among factors that sports clubs must consider.

These criteria support the decision to build a sports stadium outside of town. Despite fact that literature questions the economic logic of big league sports stadiums, especially when financed, they are nevertheless built. Theoretically, when major league stadiums are built in the central business district (CBD), the percentage of regional wealth in the metropolitan statistical area increases, and this share rises as more major league teams play there. Reason for this is that persons who attend games in CBD are more likely than those who attend games in non-CBD locations to spend money in the CBD before and after game. Non-CBD stadiums, on other hand, may incur opportunity costs. Many of these stadiums are surrounded by moat of parking, which may deter growth. Investments that could have stimulated economic activity

are occasionally redirected outside of urban region. Theoretical expectations are supported by empirical evidence. Table below table 4 describes different theories mentioned in literature reviews regarding choosing optimal location of physical structures of firms and companies. Since there is no specific literature mentioned related to sport stadiums structure this locations theories could be applicable to choosing most appropriate location for sport stadium. Each of theories below is comprised of different paradigms and approaches, for which some have got advantages and disadvantages.

Table 4. Locations selection theories for physical structure Source: (edited by Author)

Location Theory	Founder	Main Approaches
Neoclassical location theory	Pellenbarg (2002)	<ul style="list-style-type: none"> • Cost minimization • Profit maximization • Variety of location factors e.g. transport costs, labor costs, market size
Behavioral location theory	Pred (1967)	<ul style="list-style-type: none"> • The significance of limited data • The ability to utilize data • Mental maps and perception • uncertainty
Institutional location theory	Hayter (1997)	<ul style="list-style-type: none"> • criticality of social and cultural context in the decision making process • Negotiating power with deliverers and suppliers, local, labor unions and regional or national governments

Neoclassical theory is used to compute the best site location, while its empirical value is questionable. Classical theories have focused more on developing behavioral theories of location equilibrium, or merging location and production theory, than on providing empirical guidance. Neoclassical theory discusses how decisions should be made rather than how they are made in reality (Smith, 1971).

Profit maximization isn't often primary goal of some projects, neoclassical theory is important as standard in this case, but it ignores project internal dynamics an

internal world of imperfect knowledge and uncertainty. According to this concept, firms with large volume of data and a significant ability to process data are close to conventional optimal placement. Firm is shown as an active decision-making agent in a static environment in the neoclassical and behavioral approaches. This basic depiction of the firm's locations behavior was severely questioned during the 1980s, however. As a result of this new revelation, many people believe that society's cultural institutions and value systems have impact on economic activities in space. Social and cultural context become critical in decision-making process.

2.4 Legacies Plans of Sport Stadiums

2.4.1 Introduction of Legacy Concept

Prominence of sport mega-events as well as substantial investments by host cities and regions resulted in extending perspectives towards investigating legacies plans of these events. Rising nations such As South Africa, Brazil, and china have become major parties involved in sport mega-event industry. Governments frequently defend mega-event bids by arguing that they would result in long-term macroeconomic and regional and national benefits.

Body of scholarly research on the expected economic benefits of such events reflects a high level of skepticism (E.g. Cashman, 2006; Preuss, 2007; Matheson, 2008; Higham & Hinch, 2009). Most of research on sport mega-event legacies has tended to focus on economic and infrastructure impacts, while neglecting cultural, political, and ecological legacies. However, evaluations of these events are considering a wide range of implications (including cultural, ecological, and political impacts). Necessity to use events to deliver long-term development goals has popularized the concept of acceptable "event legacies" as a component of event management in recent years (Weed & Bull, 2004). Another, more analytical amount

of studies has lately arisen, focusing on the long-term social and political effects of mega-event hosting (Lenskyj, 2008).

Concept of legacy was first introduced when Melbourne, Australia was preparing for the 1956 Olympic Games (Leopkey, 2009). Kaplanidou, K.; Karadakis, (2010) since then, both scholars and practitioners have developed eagerness for deep understanding of legacy concept. Determining definition of legacy has received considerable attention (Preuss, 2015), in addition to assessing and measuring legacy in host cities (Preuss, 2018).

In terms of identifying legacy concept, International Olympic Committees (IOC) use the term most frequently, stating that their major goal is to "encouraging positive legacy within host cities and host countries after Olympic Games " (IOC, 2007). Cashman, on the other hand, has debated this definition (Cashman, 2005). He claims that it solely promotes positive aspects of the legacy.

Researchers have also explored through what it means to create a legacy in mega sporting events, and if the focus should be on outcomes, benefits, or legacies. Scholars acknowledge that there is no simple or precise definition of legacy (Agha, N.; Fairley, S.; Gibson, H, 2012). Nonetheless, there is some prevailing opinion on what should be considered part of legacy planning, such as Preuss's (Preuss, 2007) 'legacy cube' of intangible and tangible, negative and positive, and planned and unplanned (Kaplanidou, K.; Karadakis, K 2010). These dimensions have evolved into indicators for evaluating legacy impacts.

Attempts of scholars to investigate legacy effect in more detailed manner resulted in classification of legacies. As a result, Cashman proposed pioneering classification of legacies (Cashman, 2003), this include; (1) Finances; (2) Structural,

environmental, and ecological; (3) athletics and leisure, (4) Symbol, brand, memory, and identity; (5) education and information; and (6) civic life, ethics, and culture.

Chappelet and Toohey, (2008), Scholars have used and adapted previous classifications and new categories have been introduced by some researchers. Many scholars, for example, outlined possibilities for tourism industry, including opportunities to develop tourism-related facilities (such as hotels and public transit) and service structures (such as travel products and guidance systems) in hosting cities, as well as free advertising through increased awareness of the hosting city, as a result of massive global press coverage of mega events (Karadakis, K.; Kaplanidou, K., 2012).

Question of whether sports mega-events like the FIFA World Cup and Olympic Games can help host cities develop by stimulating local economies and leveraging infrastructure expenditures is gaining traction (Chalkley & Essex, 1999; Gratton, Shibli, & Coleman, 2005; Hiller, 2000). Infrastructure investments linked with such events, as well as the expected legacy, are frequently cited by city governments as justifications for hosting mega-events (Paddison, 1993; Zhang & Zhao, 2009).

Term of "legacy" initially originated in sport management during the 1990s, when concerns about the costs and returns of staging mega-events were first addressed, not just from a financial and commercial perspective, but also from a social and environmental standpoint. Different language and culture, the term legacy has numerous origins. Despite the fact that the concept of legacy is substantial, ambiguous, and difficult to measure, regions and countries compete for mega-events that promise long-term impacts, despite the fact that they are unaware of the intricacy and uncertain nature of legacies (Chappelet, 2012; Matheson, 2010; Preuss, 2007;

Sant & Mason, 2015). In discussions of official bids, positive legacies are emphasized, while negative legacies linked with large events are neglected or ignored (Cashman 2005).

Although many definitions are presented in scholarly works, the definition of this word remains uncertain. Preuss (2007), "Legacy is any planned and unplanned, positive and negative, concrete and intangible structures built for and by sport event that persist longer than event itself, regardless of legacy formulation time and space".

Mangan (2008) indicates that legacy refers to tangible or intangible assets passed down by a forefather; long-term impact of an event or activity; act of bequeathing. Related to this, Chappelet (2012) "Legacy can be identified from many event participants' viewpoints, and it can be positive or negative, measurable or intangible, geographical or personal, purposeful or unintentional, global or local, short- or long-term, sport- or non-sport-related". In a summary, legacy is all that remains and can be perceived an outcome of major events in the environment. Table below table 5 mentions different types of legacy post mega sport events.

Table 5. Positive and negative legacies after mega sport events Source: (Preuss, 2007)

Positive	Negative
<ul style="list-style-type: none"> • Brand-new event spaces • business opportunities • infrastructure • rebirth of the city Corporate relocation • City marketing • Improved public welfare • Renewed communities spirit • Cooperation between regions 	<ul style="list-style-type: none"> • Property rental increases • A boost in employment and economic activity that is only temporary • Temporary overcrowding issue • Socially unjust displacement • High construction costs • Loss of permanent visitors • Investing in non-essential infrastructure • Indebtedness of public sector

Improvements occurring as result of events should be starting point for measuring legacies. Major economic events have relatively substantial effects, but impacts are only on demand side and in short term period. Expenses for tourists and operations, as well as one-time construction investment, volunteer and managerial skills, and other activities all reach peak, but duration of these generated activities is only for limited time. Both event demand and flow of funds leakages will return to pre-event levels of equilibrium income in long terms which justifies limitation of time during which legacies can last. In another way, enormous economic implications are not result of a single occurrence, but continual influx of free money to maintain long-term economic progress (Preuss, 2009).

Importance of location should be considered by politicians; since it exemplifies foundations of new post-event consensuses by making structural changes (Chalip, 2000). Chalip, (2000) and Ritchie, (2000) discuss requirements to 'embed' event larger city development processes. Two authors emphasize need of planning legacy before staging an event (Ritchie, 2000).

According to Faber Maunsell, it is necessary to begin earlier: 'When preparing to host and event, legacy commitment and financing must be in readiness. Economic or economic-related impacts are frequently measured in studies of mega-sport events (Maunsell, 2004). These measures include employment and tourism, (Mules, Faulkner, 1986; Ritchie, B., 1996), and infrastructure development (Kang, Y.S., R. Perdue, 1994). Environmental and social legacies are acknowledged in most studies, but only in a qualitative and generic fashion, frequently based on historical events (Hodges, J. and Hall, C. M., 1996).

2.4.2 Mega sport Event legacy Structures

Mega-sport events associated physical and non-physical structures remain most crucial aspect of process for hosting event. Since all structures remain after event ends and result in good or negative impact on host city living quality. Ritchie (2000), decision to bid for specific event is the first step in creating an event legacy below is a summary of guidelines allowing cities to maximize their opportunities for hosting mega events.

- Mega-sport events require different structures, and cities have different structures. Extra structures that event generates should become main focus of city strategy bidding for hosting event, as well as long-term requirement amplified by event.
- Obligatory structures will be divided into 'optional measures' and 'compulsory measures'. City willingness to be best positioned in the bid process is achieved by using the 'optional measures' (Preuss, 2000), noting that mandatory structures are set up during the event preparation
- Optional measures' can be implemented in future to improve host city's competitive position to allow of attraction of more economic activity.
- Some 'event structures' fade away or shrink in size after events, while others persist for long period.

Each city has varied quality aspects that make it more or less appealing as place to live, visit, establish business, or host future sporting events. Cities are competing for economic activities on global scale nowadays, and thus seeking out to host mega events as tool to accelerate economic growth. Host city is in better position to tackle mega events impacts when event legacy is significant and adequately planned in these aspects (Ritchie, 2000). Following is reviews of six 'event structures' that are frequently kept after events.

Infrastructure: Sport infrastructure constructed for mega sport events as well as city's overall infrastructure, such as airports, highways, housing units and hotels, is significant part of events structures. All sport or non-sport facilities related to the event should be merged into city's growth plans after event. Large and unnecessary structures can be avoided using temporary structures. An example is portable velodrome that is now temporary 50-meter indoor pool in a convention center (FIFA world Cup Event Structures Fukuoka 2001). Another example is football stadium converted from multipurpose sports stadium (Commonwealth Games, Manchester 2002).

Long-term durability of infrastructure enhancements undertaken during mega-event is still major concern. If infrastructure built in preparation for mega sport events considered viable, probabilities that these investments may have long-term social and economic advantages. However, if infrastructure is not deemed sustainable, it can become financial and political burden for host cities and countries. South Korea and Japan spent lot of money on stadiums buildings, with each country providing ten stadiums; however sport stadiums built for World Cup in Japan have left legacy that has poor financial impacts, according to evidences. There are countless cases of event infrastructure that has been left underutilized after events, and not considered as a local cultural asset by communities, which results in underutilized sport facilities that continue to be financial burden for towns (Smith & Fox, 2007).

Knowledge, Skill-Development and Education: Staging of mega-sport event imparts knowledge and skills to participants and local population. Employees and volunteers gain information and skills in areas such as event planning, human resource management, security, hospitality, and service. Volunteers and spectators are taught how to use public transportation and are introduced to environmental projects,

as well as developing better understanding of cities and countries in different dimensions such as history, culture, and other challenges. Participants gain knowledge and skills as a result of the staging of a mega-sport event (Burbank et al., 2001).

Image and branding: Symbolic value of mega-sport events is enormous, and they can reposition region of the city or solidify country image. Global visibility of event, the host city, and its culture, on other hand, is dependent on media representatives and cannot be completely controlled by organizers Author (1986). Negative incidents are such as bomb attack, hooligans, organizational flaws, or just bad weather, according to (Preuss, 2000).

Organizers and government invented hospitality concept that included government resort service, site marketing, a cultural program, and service and friendliness campaign as ways of enhancing image and reputations of cities (Lewis 2005). Qatar's hosting of 2006 Asian Games in Doha is example for establishing city branding and image; country was attempting to rebrand itself and its infrastructure in order to become the Arab world's sports and entertainment capital (BMI, 2006). 2002 World Cup gave chance to showcase to little-known, football region on the Eurasian continent to international audience (Horne, 2004).

Emotions: Mega-sport events empower politicians with a coherent understanding for attaining international acclaim, and residents may become emotionally engaged. Prestige of hosting such event fosters a sense of belonging, vision, and inspiration in the community. The Olympic Games in Seoul in 1988, for example, fostered a sense of national pride, vitality, participation, and recognition, as well as an international perception of being contemporary and technologically advanced.

Through 2008 Olympics, Chinese were eager to demonstrate their growing economic significance (Denis, 1988). Predicted inflow of funds, as well as possibility of having beneficial post-event legacies promotes private businesses (Lin, 2008). This may alter willingness to invest rather than save cash.” Following the announcement of the event, a program of anticipatory investment is implemented” (Thurow, 2004). It is the stimulus for a number of 'piggy-back' events, either directly or indirectly (which in turn promote further investment). Local demand is also boosted during the event itself. While all of them have a short-term economic benefit, the key to any long-term effects is whether and how they leave a lasting legacy in infrastructure or industrial capabilities.

Several consequences from the Olympic Games indicate that these integrative investments have occurred (Swann, 2001). Some events outcomes have generated overabundance, according to some critics. If new event facilities use the space of low wage workers' areas, negative opinions may arise (Preuss, 2004). Residents are then subjected to eviction and relocation, as well as commercialization of their neighborhood, resulting in the loss of their social context (Garcia, S., 1993).

Culture: Mega-sporting events generate cultural aspects, identities, and products. Opening ceremonies, in particular, feature a cultural-artistic component that serves as a refined exhibition of the host country's culture. Significant cultural and social identity, more awareness, new infrastructure, and extra tourist products, when paired with the soft component of improved service quality, have a lot of potential to boost tourism in the long run. For example, Barcelona used the Olympics to turn its infrastructure into a "culture city." (Preuss, H., 2006).

Host population is educated and forced to defend its history as a result of the cultural presentation. For example, during the 2000 Sydney Olympic Games in

Australia, there was a greater appreciation of Aboriginal identity, and during the 2002 Salt Lake Olympic Winter Games in the United States, there was a broad appreciation of Mormon culture (Garcia, S., 1993).

However, cultural understanding is vital in improving the condition of these communities. Another example is the 'Spirit of Friendship Festival,' which was created to memorialize the Commonwealth Games in 2002 and to leave a cultural legacy. 'It was a Commonwealth-wide program aimed at promoting visual and performing arts as well as cultural customs ' (Maunsell, F., 2004).

Networks and connectivity: Networks are formed as result of international sport federations, media, politics, and others working together increased understanding of sport to host successful events. Networks between politicians and sport federations, and perception of visions to develop sport cities all help to improve sport affiliation, consequence of this might be grassroots coaching program, school facilities, and sport for everybody, and more sporting events. 2004 Olympic Games in Athens, for example, global security network was created. Table -table 6- below identifies examples of urban features that represent each event structure.

Table 6. Structures affected by staging a mega event Source: (Preuss, 2015)

Event structure	Examples
Infrastructure	Roads, airports, venues, parks, electricity supply, harbors, homes, beaches, fairs, sewage plants
Knowledge	Volunteering, the bidding process, employee up-skilling, school education programs, event organizing, and volunteering are all topics that come up frequently. service skills
Policy	Education (school curricula), security, sports, the environment, social, governmental policies (city, region, and nation), and legislation are only a few examples.
Networks	Global security network was established for the 2004 Olympic Games in Athens, for example.

2.4.3 Evaluation of Event Legacy Obstacles

Three challenges must be addressed in order to evaluate the legacies of events; section below summarizes obstacles associated with assessment of legacy plans, and means of how to overcome these difficulties in process of formulating legacy plans:

1) There are difficulties to say whether a legacy is positive or harmful because it can be both depending on the stakeholders involved. As a result, legacy assessment must be based on the social wellbeing function defined by decision-makers. The wellbeing function ranks social status and so aids politicians in aiming for legacy that benefits impoverished and disadvantaged groups while it might being perceived negatively by other groups. Furthermore, the area in concern must be specified properly, as various spaces have different legacies.

2) Measurement of legacy across time presents a number of challenges. Only indirectly, a mega event affects location characteristics, spurs social transformation, environmental benefits, and economic activity. As a result, legacy cannot be identified in isolation from city development.

3) The key objective that politicians attempt to accomplish through legacies is to improve people's quality of life. This can be accomplished by changing the city's location factors, as previously stated. Citizens' evaluations must be used to assess quality of life.

Citizens, on other hand, frequently cannot differentiate between change resulting from events and typical rates of growth, linking changes to occurrences. We can label this the 'placebo legacy' if they mislead us about the rates of growth from events. This type of 'misunderstood' legacy is worth investigating more. It is typical for citizens to incorrectly feel that an incident has impacted their quality of life.

Legacies can be infused together with normal city development, in which case change can be presented as a "placebo" legacy, with the condition that all new constructions create an event legacy. It may be critical to determine which changes in hosting city buildings are results of an event or the natural rate of city expansion, and which ones are considered and already planned.

Legacy can be counted as accelerated development if the purpose of the event is to remove barriers or raise funds to accomplish a goal. Event legacies can also arise through the emergence of new structures as a result of the event. If existing structures are renewed, they may be able to generate a so-called "retro legacy," in which the lifespan of the structure is extended or increased. When infrastructures developed for one event are reused for a distinct reason, with low cost to adjust, a "re-use" legacy is created. The newly constructed facilities for event can create a legacy from legacy plans of facilities, if used same sustainable way (Preuss, 2015). Figure 2 below shows both economic and non-economic legacies correlated to their values through different timing starting from the event year till the long-term value after many years.

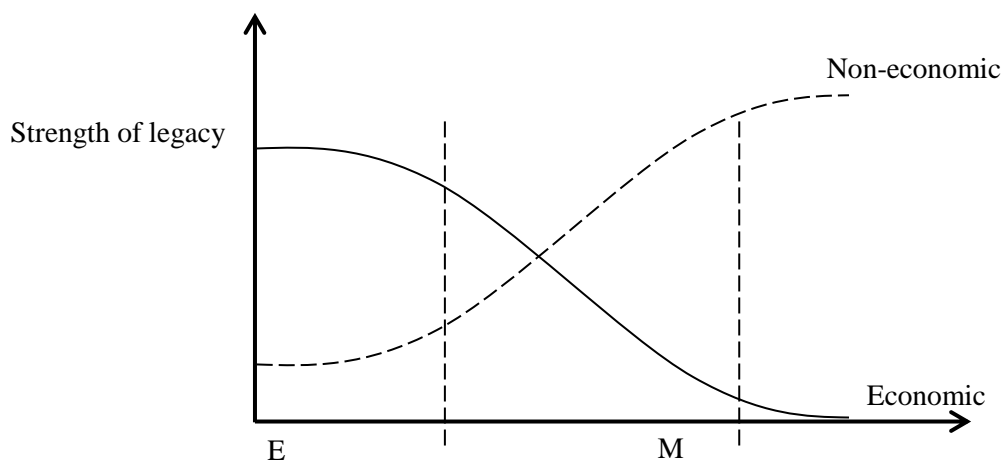


Figure 7. Strength of legacy in relation to time for both economic and non-economic legacy source: (Li & McCabe, 2013)

2.4.4 Pre Planning For Legacies

Adjustments that events cause should be starting point for legacy measurement. Despite that economic impact of events is significant; it is only temporary and solely on demand side. Investments in temporary constructions, tourist and operational expenditures, volunteer and managerial activity, and other activities related to the process of planning for mega sport event all reach a peak only for brief period of time. However, due to Imports, tax rates, and savings, stimulated consumption-based economic activity continues to decline through time. Because long-term economic growth necessitates availability of steady influx of funding, massive economic consequences are not considered event legacy (Preuss, 2009). In terms of event-related economic growth, this can be better achieved if the event has modified host cities structures; supply side of cities. Politicians should strive to implement structural changes that improve location factors, which have long-term consequences.

There is criticality to emphasize importance of leveraging post-event impacts in order to justify public infrastructure investment (Chalip, 2000). Ritchie goes on to say that events must be "embedded" in larger city planning processes. Both of aforementioned authors emphasize the need of legacy planning before a performance (Ritchie, 2000). Faber Maunsell states that "hosting mega event requires devotion and funds for legacies must during early stages of planning process".

Scholarly related to planning and hosting mega events are often related to analysis of economic impacts (Maunsell, 2004). These can be related to infrastructure, tourism industry, (Kang, Y.S., R. Perdue, 1994) and employment (Mules, Faulkner, 1986; Ritchie, B., 1996). Environmental and social implications are also discussed in most studies, but only in a qualitative and generic approach, frequently based on past

events. This is due to the fact that majority of researches and reports are produced before occurrences of mega events, and legacies cannot be measured or based on scientific data without evaluation of realistic performance in field (Hodges, J. and Hall, C. M., 1996).

Interpretation of have been mentioned above, that pre planning for event legacies cannot be framed precisely by means of establishing unified conceptual framework or guidelines packed up by theories and practice, planners can follow to formulate adaptable legacies. Uncertain nature of legacies and hardness to quantify it result in unpredictability of legacies level of efficiency.

2.4.5 Factors Impacting establishing Positive Legacies

Researches indicate that large events and stadiums have potential to contribute to the development of neighboring areas in terms of redevelopment, but still there is several factors influence regeneration of positive legacies (Davies, 2010). Davies, (2011), Indications from past Olympic hosts reveal that one of the most critical criteria in achieving economic and social regeneration legacies is ensuring that permanent venues have long-term uses and are economically sustainable. This would not only maximize opportunities for employment within sport stadiums facilities and increase profitability on any state investment, but it will also add vibrancy to areas surrounding venues and encourage further investments and utilizations.

There have been multiple instances where Olympic cities have been unable to acquire immediate tenants for sporting venues that have been built. Searle (2002), states that lack of reutilization of Sydney's infrastructure has resulted in possible economic and social implications that will take longer periods to be recognized. Mangan, (2008), correspondingly, influence of Athens Games on broader rehabilitation has been limited, with numerous venues in disrepair and entire regions

cordoned off to avoid vandalism. Furthermore, like in Sydney and Athens, fear of is prevailing in Beijing that long-term use of numerous facilities, including renowned Beijing National Stadium, is in doubt, which might have an influence on area's long-term development plans (Davies, 2011).

Only rational justification for hosting mega events is if the infrastructure required for preparing to host event is aligned with future development plans of cities; speaking from economic and urban development perspective (Preuss, 2004). However, if hosting mega sport events can be utilized to move forward in terms of urban redevelopment and help accelerate already planned urban programs, the outcomes will be more positive and long-lasting. Olympics' integration into city's long-term strategic goals was widely recognized as crucial factor in city's successful rehabilitation (Coaffee, 2011; Monclus, 2011). On other hand, organizers of Sydney were chastised for not paying enough attention to broader master planning, which was identified as reason in area's late rehabilitation (Brownhill, 2010). Furthermore to extending current redevelopment programs, event locations and venues will be integrated into longer-term redevelopment plans.

According to the Royal Institution of Chartered Surveyors, multi-level leadership with a broad number of stakeholders, strategies that facilitate broader regeneration, and balancing event delivery and event legacy are all crucial aspects in generating a positive physical legacies (RICS, 2011). Some analysts predict that the wider economic and political circumstances, in which the Olympic Games are held, as well as the subsequent regeneration, are crucial to establishing constructive regeneration legacies. Relating to studies on impacts of Olympic Games on real estate; Context of host cities is important, and success of Olympic legacies is

frequently dependent on a city's economic and political condition (Plumb and McKay, 2001).

2.4.6 Case Studies of Reused Urban Sport stadiums

Beijing, China 2008 Summer Olympic Games: Beijing was elected as host city for 2008 summer athletics, getting ready for this mega event, Chinese government restored and created venues outside Beijing likewise as fifty-nine coaching centers. Most important structures engineered were Beijing National structure, Beijing National Aquatics Center, Beijing National Indoor structure, Olympic inexperienced Convention Center, Olympic inexperienced, and Beijing Culture & Sports Center. Table below reviews legacy plans of Beijing sport venues for 2008 Olympics.

Table 7. Legacy plans of Beijing sport venues for 2008 Olympics source:

Venue	Type Of Legacy Plan
Sport venues	Sports facilities, conference centers and public event facilities, Restaurants, cafés, and exhibition halls, shops and fitness centers
The National Stadium	Green Tennis Centre both received an IPC/IAKS distinction.
The International Broadcast Centre	Conventions and tourism.
The Water Cube	Multifunctional indoor sports and recreation center. Water recreation, sports, tourism and shopping.

2008 games left profound inheritance, like accessible venues associate degreed urban infrastructure system that visitors still utilizing. The National Aquatics Center, also known as the Water Cube, was built for the national capital Summer Olympics and served as outstanding location for the games. The site of Olympiad games was transformed into China's largest indoor water park "Happy Magic Water Cube", at the

completion of the tournaments. Water Games Park -under the sea themed park- is utilized all year to captivate both residents and tourists from all over the world. Figure below illustrates images from China water cube which transformed after Olympic into public water park. Furthermore the National Aquatics Center will be transformed from Water Cube to Ice Cube preparing to host 2022 winter games (chinadaily.com, 2021).

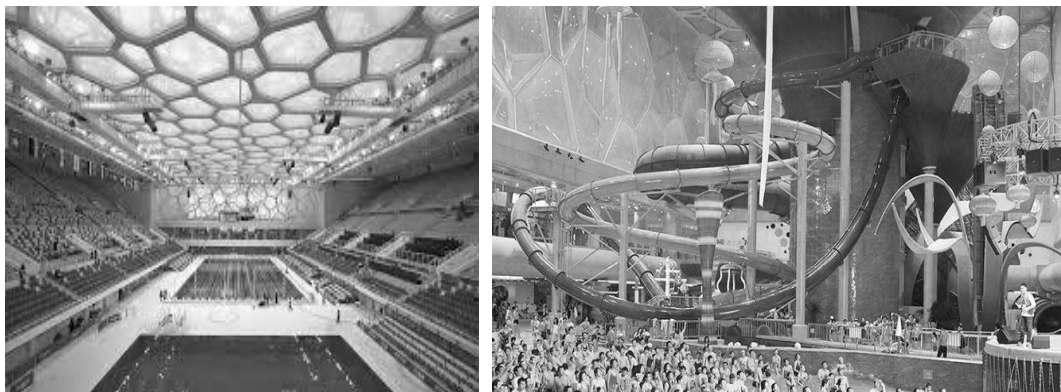


Figure 8. Legacy plans for China summer Olympic Games 2008 Source: (white water.com)

Atlanta, USA 1996 Summer Olympic Games: 1996 Summer Olympics in Atlanta is credited for Atlanta is undergoing a transformation, particularly its already Centennial Olympic Park, which before the Olympics was mostly composed of managed warehouses. Fountains of Rings are part of the park that is currently functioning as one of largest interactive fountains in world, and a very iconic tourist's destination.



Figure 9. Fountains of Rings in centennial Park after 2006 Olympics Source: (By Scott Ehardt)

2.5 Urban Development's Assessments

2.5.1 Indicators of Redevelopment

Districts revitalization should demonstrate primary goal of sports stadiums projects, thus formulating tools to measure and determine level of developments that has been achieved is pivotal. Robertson (1995) presented valuable framework for evaluating these projects catalytic abilities by innovating strategy of "special activity generator" (SAG); model that describes and measure downtown redevelopment. This method is based on idea that major facilities that produce unique activity within a district (such as stadiums, arenas, convention centers, and aquariums) can serve as anchors for revitalization by attracting visitors and sub-urbanites to events held downtown. Inflow of individuals generates critical mass required to sustain district's restaurants and other retail outlets (Sternberg, 2002). Furthermore, these projects frequently spur other public-sector investments in neighborhoods, such as new infrastructure or urban design upgrades, all of which contribute to establishment and maintenance of regenerated developed district.

Robertson (1995) states that SAG strategy is composed of three fundamental objectives, these objectives include:

1) Stimulation of business and commercial vitality, and increase expenditure in neighboring district as result of spending generated by spillovers

2) New constructions of buildings and infrastructures should be built in district, and deteriorated neighborhood should be revitalized.

3) Rehabilitation of urban decays and devastated areas.

Three indicators of urban redevelopment can be developed from this broad list of SAG objectives:

- *Revitalization of existing deteriorated buildings or spaces*: activity generated by SAG initiatives is meant to drive spillover development in form of new enterprises in surrounding district. Derelict or nearly vacant structures that litter many downtowns are likely place for these new companies. If new sports facility causes buildings that were previously underutilized to be turned into retail and restaurant spaces, this is considered urban regeneration.

- *Emergence of mega projects and new buildings units within stadium surrounding district*. On nearby blocks, new construction is frequently in forms of hotels, restaurants, or even residential spaces. Another measure of urban revitalization is construction that may be linked to original SAG investments.

- *Implementation of new sports facilities within stadium surroundings*. In this situation, district becomes renowned primarily for activities associated with district's principal anchor. Because of upfront investments in SAG, visitors to district should have a safe, interesting (though somewhat sterilized) urban surroundings.

In framework of study, reuse of derelict buildings, new construction, and recreated district image give preliminary evidence for determining that investment in

sports complex sparked urban revitalization. These physical markers are valuable for two reasons, not withstanding their firmness and lack of longer-term indication of neighborhood rejuvenation. This visible evidence of redevelopment is frequently used by public authorities and planners as measures of policy and project success (Pagano & Bowman, 1995). As a result, these metrics are important component of how planners and politicians evaluate success (or failure) of many SAG initiatives. Second, as previously said, public investments in sports projects are now justified in large part by their capacity to spur redevelopment on adjacent blocks. As result, these physical indications are most adequate tool to determine whether or not project's redevelopment objectives were achieved. Figure -see figure 5- below illustrates framework established from analysis of indicators of physical urban developments related to SAG theory for assessment of the physical urban development according to the indictors mentioned in the theory SAG projects.

2.5.2 Assessment of physical impact of sport stadiums

Assessment of each indictor and research tools required to establish framework for assessing levels of physical urban development occurred by a certain urban feature in cities hosting mega sport events. Figure below (figure 7), represents main conceptual framework for assessment of rate of physical development according to indictors of SAG theory mentioned in previous sections, each indictors will be investigated using different research tools relatively with variety in type of data that will be processed.

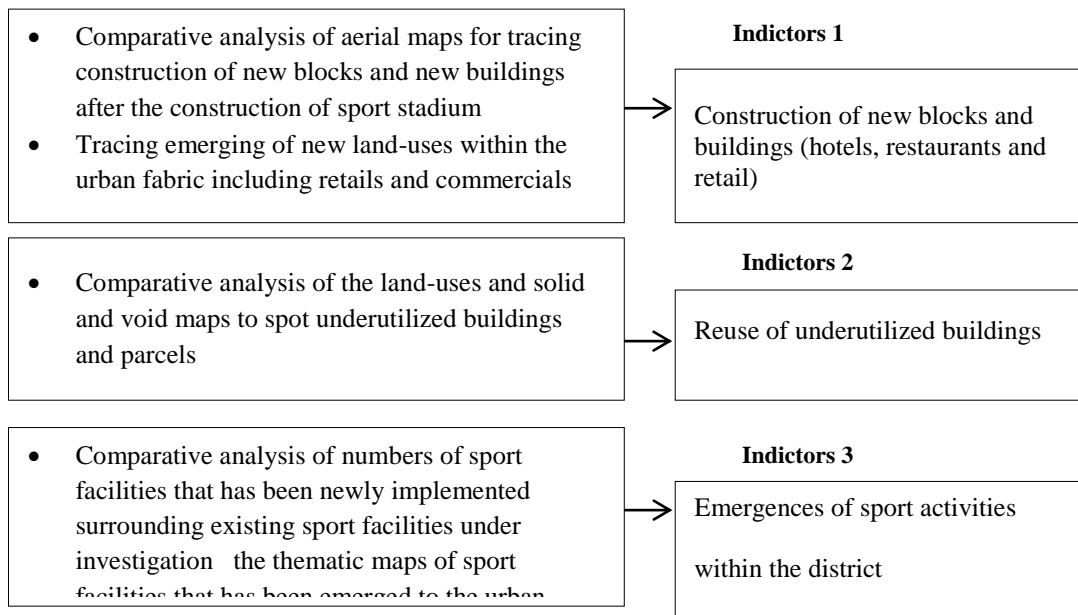


Figure 10. Framework for assessing physical urban development Source: established by author

2.5.3 Urban development and Sports

Cities and regions compete for bidding by spending capital of public resources, and modifying physical aspects of their communities to meet their demands seeking out attracting frequently time-limited activities. In terms of job creation and economic growth, such policies for bidding for events are defensible although there are still some unresolved questions. Some economic benefits from sports development may be dictated to communities, but capital owners and event organizers may be main beneficiaries of events financial outcomes. It is crucial to prove and investigate in whether such regulations comprise sustainable and effective growth strategy through sport development, or whether leads to unequal economic and social outcomes within the city.

Positive Economic outcomes of stadium construction have yet to be verified. After studying cities before and after the establishment of professional sports stadiums in the United States, it was determined that these advancements were not significant in influencing growth in real per capita income (Baade, 1995). Scholars examined data from 1959 to 1987 to conclude that there was no incentive to a geographic area investing in stadium construction for economic purposes. Further, Rosentraub and Swindell (1993) have formed Conclusions stating: In Fort Wayne, Indiana, avoiding investing in a minor league baseball stadium appears to have aided economic development.

Despite fact that situation in Europe is very exceptional, with significant events generally taking place in franchise sports, economic rewards beyond short-term expenditure are also impermanent (Spilling, 1998). Several national surveys in US have found that benefits of stadium development are distributed inequitably across city populations (Kidd, 1995). For example, there has been discussion over the implications of sports-related development on the real estate market and the revenues that flow towards certain groups and individuals (Hiller, 1998). In such circumstances, public investment in privately owned team sports distributes risk of long-term debt connected with infrastructure development away from team owners and operators and onto the local public sector (Rosentraub, 1988). However, such development can have tremendous effect on social and economic fabric of the city.

Olds (1998) determined that in most situations, faster urban transformation is required to accommodate significant events, and that the socially underprivileged suffer disproportionately as a result. Mega event development plan can harm existing businesses in the city: Prior to the 1992 Olympic Games in Barcelona, small companies threatened by eviction to allow vacant places for new developments

(Shapcott, 1998). Stadiums development policies that concentrate on attraction of worldwide known major events may have considerably more negative effects for locals than stadium developments that service season-based businesses. Higham (1999) claimed that major-event strategy promoted infrastructure development that was unsuitable for host city's long-term demands. When such concerns are combined with evident financial burden that can accompany stadiums building in form of long-term public debt, potential for negative consequences appears to be significant (Roche, 1994).

2.5.4 Urban Development Outcomes

Urban development outcomes are substantial despite of it been inadequately perceived when it stadiums investments are debated. cities form partnerships to build new major sport stadiums, seeking out targets of revitalizing specific geographic areas, typically in central city locations where large parts of vacant, underutilized, and often environmentally contaminated land are adjacent to major transportation systems. These urban redevelopment goals are more physical development oriented than common economic (jobs and taxes) development, aiming for physical improvements such as; adding new buildings or implementing different activity, and improvements in land-uses homogeneity (e.g., from heavy industrial to mix used districts).

Vacancy rates decreasing as result of intense density is improvement associated with rising of new private investment in real estate development projects that attract new businesses and residents, generating new sources of property tax revenue while also adding vibrancy to underutilized regions of city. Encouraging sport facilities developments master plans contributes to increasing rates of developments of areas, since facilities play role of anchors to large development initiatives, generating a critical mass of consumers that will support development of

restaurants and retails. Presence of such new activities is trigger for new residents and businesses; this as well results in more new construction. In physical "trickle down" impact or built environment multiplier effect, redevelopment cycle continues. Certain types of urban development outcomes related to improvements in land use patterns, developing of new private investment, and changes in vacancy rates might be straightforward to measure, it can be extremely challenging to interpret. Section below summaries challenges of measuring developments rates in details.

First is evaluating urban development impacts is difficult due to fact that urban development impacts are in districts or sub-districts, whereas economic benefits cannot precisely be measured in presence of political and legal bounds.

Second is issue of attribution, or cause and effect: if only additional 3,000 housing units have been implemented within surroundings of new stadium over 15-year period, rationality of relating this increase of residential units to construction of sport facility within area under analysis is redundant.

Third is substitution impact can be characterized as "growth here, not there" in urban development terminology. If market demand for new housing remains constant over ten-year period, new residential development near sports complex effectively redistributes demand from other parts of region and maybe city

Fourth is that real estate development and property ownership particularities affect the evaluation of outcomes. However, team owners are becoming increasingly oriented into real estate dealings next to their facilities, and by doing so, they can influence urban development to benefit their primary companies, which may or may not be sport team.

2.5.5 Urban Development Strategies

Spatial growth and environmental improvement that represents topics related to improvements strategies of mega sport events to within host cities are perhaps most significant urban development techniques to appear in literature. Majority of strategies focused on how to align improvements that should be carried out for mega sport event preparations with urban transformation plans meant to meet long-term demand. general adjust in urban development policies from a focus on building enormous sports facilities and urban infrastructure to a much broader notion of urban redevelopment and reshaping projects, with mega sport events serving as a catalyst (Chalkley and Essex, 1999).

Rome (1960), Berlin (1936), and Tokyo (1964), are examples of host cities where in order to achieve level of urban upgrading and development, cities have refurbished and extended existing facilities, built iconic buildings, and generally enhanced existing infrastructure. Chalkley and Essex (1999) explored that Olympics, as a mega sporting event, can serve as an opportunity for urban transformation through the installation of Olympic venues. In these two cases of Seoul (1988) and Montreal (1976) urban renovation and plans for "improved traffic management, upgrading of cultural institutions, an ecological revitalization scheme, and efforts to maintain health and hygiene standards throughout the city" were established accompanying sports facilities and Olympic towns (Chalkley and Essex 1999).

Furthermore, Olympic facilities are increasingly being integrated into substantial urban development plans in host cities, allowing them to be repurposed into sports and recreation complexes, waterfront developments, or housing and tourist accommodation after the Events. By far most comprehensive illustration of how Olympics may serve as spur for urban development is example of Barcelona (1992).

Not only was Barcelona's urban configuration transformed by development of four Olympic sites in various types of locations (such as a low-income neighborhood, a declining industrial site, and shoreline area), but many previously proposed programs has been accomplished, such as creation of public open spaces, general improvements to public transportation, opening of city fabric to waterfront, renovation of city's cultural infrastructure, public open spaces landscaping, and installations of new works of art, were also implemented. These programs could have experienced tremendous delays or perhaps cancellation if they hadn't been funded (Chalkley and Essex 1999; Marshall 2000, 2004).

Although most of studies and examples mentioned above are devoted to Olympic games but this still represents mega sport events that has lots in common with mega sport event in case study of research FIFA world cup. However Implication and findings of literature reviews vary slightly as adjustments to different bidding requirements for each event

CHAPTER 3: RESEARCH METHODOLOGY

Chapter 3: reviews methodology of research, conceptual framework and literature reviews summary. Chapter includes selection justification of case study and research problem. Chapter also reviews methods of data collection, and methodologies used to analysis and investigate collected data.

3.1 Justification and Significance of Study

Case of states Qatar represents new addition to researches content since it's going to be first event of its kind in Middle Eastern countries. Many lessons will be considered for any upcoming mega sport events in region. Since Qatar is considered relatively small country, hosting of mega event as FIFA world football required massive changes and improvements to country urban structure, by means of implementing new mega infrastructure and planning for event legacies to adapt with country futuristic visions and redevelopment plans. Assessing and quantifying rates of urban development achieved through hosting mega event in small countries would be answering questions related to legitimacy of these countries to leverage such events.

3.2 Conceptual Framework

3.2.1 Research Methodology

Each objective of research will be achieved through adopting different appropriate methodology that helps approaching precise outcomes and results. Comprehensive literature reviews have been carried out about each topic related to each objective of research. Section below presents conceptual framework derived from analysis of theories mentioned in scholarly. Figure below illustrates flow of research process structured to attain the 4 objectives of research.

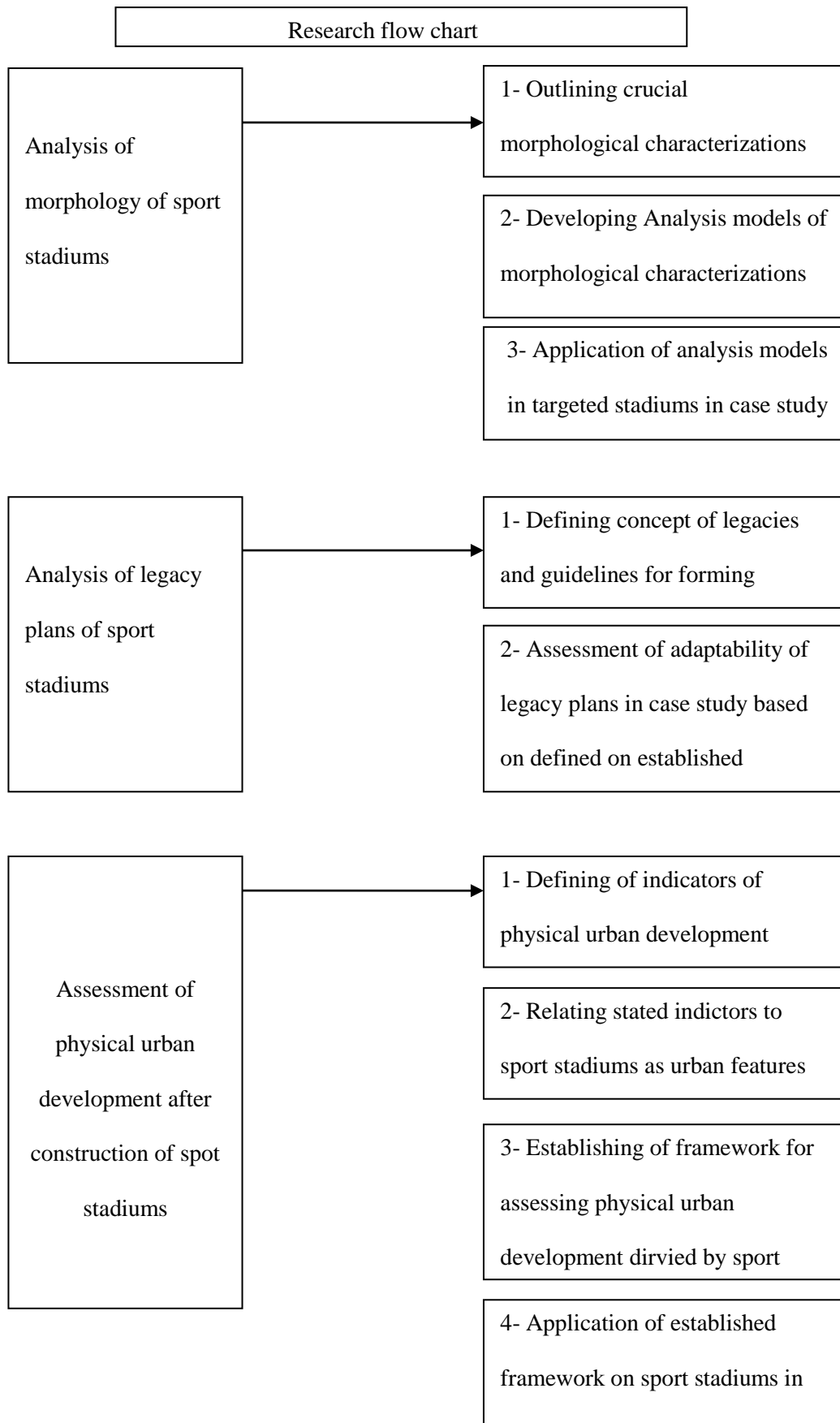


Figure 11. Research flow chart source: established by author

Accessibility analysis: Quantifying opportunities for mobility (access) to various services, goods, and activities is required for measuring accessibility (hereafter destinations). As a result, accessibility is determined by both an individual's location and the locations of potential destinations (and the distances between). In most accessibility models, two elements are taken into account: distance and destination choice. As a result, accessibility metrics are a function of the distance (spatial distance, commute time, or cost distance) necessary to reach destinations as well as the quantity (and/or variety) of destination choice available (Handy and Niemeier 1997).

While a variety of potential accessibility measures have been proposed for a variety of applications and objectives, they can typically be divided into four categories: opportunity measures, gravity-based measures, utility-based measures, and space-time measures (Liu and Zhu 2004). For a particular distance measurement, opportunity measures calculate the number of potential destinations that can be reached by an individual.

Within the cut-off, all potential destinations are equally weighted. Depending on the distance conceptualization, opportunity measures can be easily estimated in a GIS utilizing geographical buffers, network based Isochrones maps (contour lines of equal journey time), or accumulated cost surfaces.

Simplified accessibility space-time measures model (Liu and Zhu 2004) is adopted to conduct this analysis. Model calculates number of population that can reach out for stadiums location by means of public transportation systems (in this case is Doha metro lines) within different distances from each stadium locations, as well as distances to main urban spots and hubs within metropolitan levels

Physical urban development assessment: Physical improvements of urban fabric surroundings of each sport stadium project were identified, between 2010 and 2015 (period of booming of construction of sport stadiums in the state of Qatar).

first step is to identify baseline conditions prior to construction of targeted examined sport stadiums. This stage of research required examination of aerial photographs, population data, and variety of thematic maps on various subjects including case study country administrative boundaries, changing in population distribution, and distribution of sport faculties.

Tracking and quantifying changes in physical contents of urban fabric surrounding sport stadiums requires analysis of database about prevailing Geographic conditions and built form in municipalities and zones (administrative units in case study) before construction of sports stadiums. Data for pre- construction of sport stadiums conditions in state of Qatar were analyzed. Most of data is sourced primarily from Ministry of Municipality & Urban Planning (Baladiya) in Qatar and online platforms of Qatar Development Atlas (psa.gov.qa), which presents number of thematic maps on various topics.

Data include graphics, as well as time-series comparison representations, Census information collected through Census conducted between 1986 and 2015, and aerial photographs. GIS data layers for different zones where sport stadiums are located were gathered from additional data request online service offered by urban planning department in state of Qatar. These resources allowed generation of color coded maps and data layers including building footprints, blocks boundaries, streets network and main transportation routes.

Second stage of research is assessing of physical conditions in urban surroundings of sport stadiums after stadium is constructed. This stage of analysis

required updates of thematic maps and dataset for each municipality of state of Qatar where targeted sport stadiums in research were located. More recent aerial pictures were used to trace changes and improvements in physical context. This included analysis of block-level data, planning documents, journal articles, and interviews with professionals and urban planners. This provided evidence on physical development in urban fabric in form of tracing generation of new blocks and buildings, renovation and reutilizing of vacant buildings. Research tools followed in this study is based mainly on qualitative comparative analysis tools.

3.2.2 Samples Selection Criteria

Four sport stadiums are examined; newly constructed or innovated stadiums that have been built to prepare for hosting FIFA world 2022 in state of Qatar. Targeted Stadiums will remain as permanent structure within urban context they were built in. study will be analyzing various dimensions of each sport stadium with major focus in physical aspects; stadiums level of integration into existing urban fabric, future development plans for area stadiums were constructed, in addition a comprehensive accessibility analysis for each stadium location, quantification of physical urban development occurring after construction of sport stadiums and compare it to nature development rates if stadium was not existing, using conceptual framework and frameworks established from analysis of theories mentioned literature reviews.

Selection of four stadiums dependent on; 1- choosing different locations within urban context of case study (urban and suburban areas), 2- stadiums construction starting time, in order to unify variables, chosen stadiums are all constructed between 2010 and 2020, 3- permanency of stadiums structures selected in

sample that will remain post mega events, because obviously not purposeful to study stadiums that will be prefabricated and remove post mega sport event

3.3 Data Collection and Analysis Tools

This research was conducted using qualitative research methodologies, namely an integrated literature review. Qualitative study was carried out to gain a better grasp of research topic and to develop descriptive conceptual framework for assessment around research topic. Wide ranges of sources were employed in the study, and data were generated through; Comprehensive literature reviews, Site visits and assessments, Interviews with professionals and local residents, and statics and quantities data collection regarding capacity of stadiums, and total numbers of targeted users, and populations' data at level of pre-defined administrative units.

3.3.1 Research Tools

1) Integrative literature review: Literature review is divided into five steps:. Integrative literature review's outcomes can contribute to additions of research by to existing body of knowledge related to topics, and there filling gaps between practice and research; impact analysis of sport stadiums in physical urban development within host cities.

2) Content analysis: Content analysis of case study was through generating color coded and blocks buildings footprints maps and visual data, resulted from analyzed data through stages mentioned in methodology. These visual data illustrates main public transportation routes, community facilities and infrastructure, in addition to land uses, administrative boundaries and urban morphology of selected areas where targeted studied sport stadiums were located.

3.3.2 Primary and Secondary Data

The table below summarizes types of primary data and secondary data used in this research, and scientific tools used for processing data.

Table 8. Types of primary data and secondary source: (established by author)

Primary/ secondary data	Type of Data	Tools
Population data	Population as per the census 2015	Regression analysis
Maps and illustrations	Blocks traces, Ariel maps, land uses maps, administrative units division	Comparative analysis Urban development assessment tools
literature review	Scientific theories, definitions	Formation of frameworks
Informative interviews	Qualitative data (cost analysis, future legacy plans)	Adaptability assessment

3.4 Literature Reviews

Comprehensive literature review has been conducted as research tool to approach various theories and frameworks related to each objective associated topic. Section below review summary of literature review related to each section in theatrical background chapter.

Sport stadiums and mega sport events: Many articles contributing to documentation of knowledge about impact of mega-events are available due to popularity of hosting mega events in cities. As result, there are many similarities between sport stadium and mega sport events affect literatures.

Literature contains variety of articles related to (Baade, 2001; and Matheson, 2004).

According to literature reviews explored in previous chapter, sport stadiums were pivotal component of ancient towns. Stadiums in postmodern era, on other hand, failed to merge with surroundings context as they grew larger and become more

isolated. Sport stadiums have evolved significantly in terms of their integration into urban fabric and contribution to urban development.

Indicators of Physical Urban Development: Assessment and quantifying physical urban development required exploring literature related to urban development assessment tools, and definition of indicators that evidence urban development in general and physical aspects specifically.

Concept of special activity generators theory was explored, idea of it that these special activity generators that function by engaging visitors as redevelopment tools and spurring private investment. Examples of these activities generators include; Stadiums, arts centers, convention centers, and aquariums (Robertson, 1995).

Sports stadiums have been studied as type of special activity generator (SAG) in recognition of their contributions to urban regeneration, especially in terms of their effect on housing units numbers and values, and increasing of business vitality and commercial land-uses within surroundings of stadiums structures (Ahlfeldt and Maennig, 2010; Feng and Humphreys, 2012; Tu, 2005; Chapin, 2004). However, studies which look at impact of stadiums on micro level rather than regional level have revealed mostly good results (Austrian, 2002; Rosentraub, 1997).

Considerable growth in number of individuals living in or around sport facilities has been detected, while most academic study focuses on major league sports stadiums, updated researchers have found that minor league sports stadiums give equal benefits (Chapin, 2004; Cantor and Rosentraub, 2012). Agha (2013) discovered beneficial impact on revenues in all cities hosting sporting events. Van Holm (2018), as well revealed local impact on incomes and demographic shifts in vicinity of stadiums.

Site Analysis of Sport Stadiums: Selection of adequate site locations has been mentioned in many theories discussed in literature, but none of them appear to specialize in subject of sport stadiums (Scott, 2000). Since there are no specified frameworks for stadiums location selection, overview of many location theories including recommendations from FIFA's guidelines reports were explored and summarized. Many location theories will be examined in stage of location decision-making process (Hayter, 1997; and Brouwer et al, 2004). It should be mentioned, location theory has been developed for firms' locations and projects, but since sport stadiums are considered business projects that require management and marketing, location theories of firms could be tailored and implemented to form guidelines for sport stadiums location selection.

Three types of location theories are mentioned in the literature: neoclassical, behavioral, and institutional approaches (Lipsitz 1984; Thornley 2002). Since various location factors have been mentioned; Hessels (1992) states: "Theory of location evaluation may assist in bringing some order to variety factors that impact firm location."

There is limited amount of literature stadium location within cities, most of this literature has concentrated on concerns of sports stadium finance, and disputes regarding ability of stadiums to improve disadvantaged with location surroundings in districts (i.e. Nelson 2001; Wassmer 2001).

Legacies plans of sport stadiums: Popularity of sporting mega-events around world, and large investments made by host cities and countries, resulted in increasing interest in studying mega events legacies (Weed & Bull, 2004). Much of research on sport mega-event legacies has been selective in its focus; economic and infrastructure benefits while ignoring social, political, and physical legacies. Necessity to use events

to establish long-term development plans has popularized concept of "event legacies" as a component of event planning in recent years.

Focuses long-term socio-cultural and political implications of hosting a mega-event have been investigated in critical literature lately (Lenskyj, 2008). Consideration of only positive legacies in most official bids is issue that has been associated with understanding term of legacy, due to lack of formal definitions of concept of event legacies Cashman, (2005).

First proposal of concept of legacy was when Melbourne, Australia was preparing for hosting 1956 Olympics (Leopkey, 2009). Since then, both academics and practitioners have become interested in concept (Kaplanidou, K.; Karadakis, 2010).

Scholars acknowledge that there is no precise definition of legacy (Agha, N.; Fairley, S.; Gibson, H, 2012).Cashman, (2005), has been criticized definitions that exclusively emphasize only positive aspects of legacy. Researchers have also looked into what it means to leave legacies post mega sporting events, and highlight importance of focus should on outcomes, benefits associated with proper planning for legacies from earlier stages of bidding for events process. Quantifying legacy after hosting events in country and city have received greatest attention the notion of legacy and (Scheu, A. 2018; Preuss, 2015).

Agreement on what should be considered event legacy is represented by research contributions of some scholars; Preuss's (Preuss, 2007), intentional and unexpected, intangible and physical, negative and positive legacy cube (Kaplanidou, K., 2010). First classification of legacy was suggested by Cashman (Cashman, 2003), 1) physical; 2) economic, and environmental; 3) memory, and history; 4) public life and culture; and 5) information and education. While the prior classifications have

been used and used by researchers, some scholars have introduced new categories (Chappelet, 2008; Toohey, 2008).

Complete definition of legacy; "Legacy refers to any planned and unplanned, positive and negative, concrete and intangible structures created for and by a sporting event that survive beyond the event itself, regardless of production time and space," (Preuss, 2007).

Another legacy definition; long-lasting effect of tangible or intangible properties and structures left after event or activity; noting that it also known as the act of bequeathing (Mangan, 2008). Mentioning that only few legacies function effectively for long term periods; new transportation infrastructures implemented during Olympic Games in many host cities, have not been continued beyond next few years after the Games according to the reports (Kassens-Noor, 2010).

Legacy is defined also; "Positive or negative, concrete or intangible, territorial or personal, purposeful or unintended, global or local, short- or long-term, sport- or non-sport-related, and can be witnessed from various perspectives of event stakeholders" (Chappelet, 2012). In nutshell, legacy is everything that remains after event and can be considered as result of event in its context. Table below summarizes literature reviews and scholarly related to each objective of the thesis including major findings and contribution of each research. Table illustrates gabs in existing scholarly related to certain topic related to objectives, which emphasizes problem statement that indicates gabs in research regarding investigating physical impacts of sport stadiums hence main focal scopes of many researchers have been concerned about economic and socio-cultural impact of sport stadiums.

Table 8. Literature content analysis source: established by author

Article	Author(s)	Research Topic	Major findings
Accessibility analysis of sport stadiums			
A sporting chance: Accessibility of proposed AFL stadium locations on the Gold Coast	Burke, M., Evans, R., & Hatfield, E. (2008)	Examining how approachable existing and new venues are for residents of the case study who use public transportation.	
Assessing Accessibility in European football clubs' stadia: Developing a European Accessible Football League Scale	Kitchin, P. J., Darcy, S., Paramio-Salcines, J. L., & Walters, G. (2020)	investigating how professional sports clubs attempt to manage their human rights responsibilities and accessibility in today modern stadiums	
Location analysis of sport stadiums			
The Manhattan Yankees? Planning Objectives, City Policy, and Sports Stadium Location in New York City	Chanayil, A. (2002)	presents two competing plans for relocating a professional baseball franchise in Manhattan and examines their claims	
Physical impact analysis of sport stadiums			
Sports stadiums and area development: A critical review	Baade, R. A., & Dye, R. F. (1988)	Investigates the economic and urban development effects of a new stadium or franchise in the area.	
Sports Facilities as Urban Redevelopment Catalysts: Baltimore's Camden Yards and Cleveland's Gateway	Chapin, T. S. (2004)	explores the effects of two well-known sports projects and derives implications from these cities' urban development experiences.	
Sport, physical culture, and the environment: An introduction	Bunds, K., & Casper, J. (2018)		
Economic impact analysis of sport stadiums			
Economic impact analysis of sports facilities and events: Eleven sources of misapplication	Crompton, J. L. (1995)	Eleven sources of misapplication are discussed in this economic impact analysis of sports facilities and activities	
Economic impact analysis versus cost benefit analysis: The case of a medium-sized sport event	Taks, M., Kesenne, S., Chalip, L., & Green, C. B. (2011)	The contrast between classical economic effect analysis techniques and a study on sports stadiums is demonstrated empirically in this paper.	
The use and misuse of economic impact analysis: The case of professional sports	Hudson, I. (2001)	investigate the explanations for the large disparity in economic impact estimates between studies	
Economic Impact Analysis versus Cost Benefit Analysis for a Medium Sized Sport Event-A Further Improvement	de Nooij, M. (2014)	Analysis of the economic impact of a certain event in Windsor, Ontario, Canada	
Doing better: Sports, economic impact analysis, and schools of	Rosentraub, M. S., & Swindell,	measure the value of the investment, which is	

public policy and administration	D. (2009)	frequently couched as an economic impact assessment
The economic impact of sports stadiums: Recasting the analysis in context	Santo, C. (2005)	By recasting a classic study, a new study examines the significance of the contemporary context in which stadiums are constructed.
The impact of stadium and professional sports on metropolitan area development	Baade, R. A., & Dye, R. F. (1990)	Assessing the impact of stadiums and professional sports teams on the growth of a community. Personal earnings.
Stadium architecture and urban development from the perspective of urban economics	Ahlfeldt, G., & Maennig, W. (2010)	a summary of the earliest evidence regarding the built environment's welfare effects, as well as projected stadium-related social costs and benefits
Sports stadia and urban development: A tale of three cities	Lipsitz, G. (1984)	Examining the state's role in urban development and the buildup of capital for private enterprise
Physical urban development		
Physical Development Of Arak City Applying Natural Indicators.	Tali, M. G., Naeimi, A., & Esfandiary, M. (2016)	Based on morphological parameters, determine the best regions for future physical development of the Case study city.
Sustainable urban development indicators in Great Britain from 2001 to 2016	Patias, N., Rowe, F., Cavazzi, S., & Arribas-Bel, D. (2021)	Quantitatively measure and evaluate essential built-environment properties, as well as their changes over time.
Stability tests of urban physical form indicators: The case of European cities	Boontore, A. (2011)	determining the most appropriate parameters for assessing degrees of evenness in urban development spread

CHAPTER 4: CASE STUDY; STATE OF QATAR

Chapter discusses country background of case study, analysis of urban structure model of country, and investigating of events structures implemented in host cities, preparing for FIFA world cup 2022. Sport stadiums constructed or renovated for hosting event is investigated and analyzed using Theoretical frameworks and conceptual framework established in previous sections of research.

4.1 Qatar Profile

4.1.1 Country Background

Qatar is small country located on Persian Gulf. Population is estimated to be 2.747 million inhabitants, 333,000 of population are Qataris nationals, and rest are immigrants from many other nationalities who were attracted to Qatar due to blooming economic growth occurring over past years (Snoj, 2019). Geographically, it is limited part of Arabian Peninsula bordered by Persian Gulf. Climate is similar to other Persian Gulf countries; dry, arid, and land is completely uninhabited (CIA, 2019). 85% of Qatar's population lives within 20-kilometer radius of country capital, Doha.

Qatar has sizable expatriate population, with over 100 countries working in various sectors of Qatari economy. Due to high oil prices, Qatar has witnessed remarkable economic growth in recent years, despite facts that Qatar's economic policy is focused on exploitation of country's non-associated natural gas reserves and increasing private and foreign investment in non-energy sectors. Qatar GDP per capita for 2020 was \$50,805, with estimated unemployment rate of 0.5 percent. Country's general statistics are summarized in Table below table 9.

Table 9. General data the state of Qatar source: (Qatar Development Atlas)

Surface	11,581 km ²
Population	2,943,175 (October 2021)
Geography	Sand and gravel desert that is flat and bleak
Capital	Doha
Religion	Islamic
Languages	Arab and English
Climate	Dry, with very little precipitation, subtropical desert
Groups	Nationals (11.6%)/Expats (88.4%)
GDP	Total: 146.37 billion US dollars in 2020

Qatar 2022 FIFA World Cup bid offered from Qatar to host FIFA event. Qatar will be first Arab state to host world Cup, with a population of 2 million (Marc, 2009). As representative of Arab World, Qatar promoted hosting of tournament and has acquired support from around Arab League member states. Country also introduced strategy of hosting events as opportunity to bridge divide between Arab and West world (ESPN, 2009). Seven host Cities of Qatar 2022 FIFA World Cup event are; Doha, Al-Rayaan, Al-Daayen, Umm Slaal, Al-Khour, Al-Wakrah and Al-Shamal, see figure 6 below- (Al-Khour and Al-Shamal are the only host cities that are further away). Doha boasts complete infrastructure, including an international airport, as well as hotels and business centers that are well-equipped.

4.1.2 History of Sport Events in Qatar

Asian Games was held in Doha in 2006; Qatar's largest sporting event. Qatar was awarded rights to host 2022 FIFA World Cup on December 2, 2010, making it first Arab country experiencing hosting FIFA world cup(Radford, 2010). Table below shows mega sport events which has been hosted by state of Qatar. Hosting these different sport events has resulted in development in several dimensions in terms of properness and readiness of state of Qatar to be able to host mega sport events. Building of new sport stadiums and facilities has resulted in improving physical

aspects of city structure and new forms of infrastructure were added to urban fabric. Mega events like Olympic Games and the FIFA World Cup have evolved as key tools for urban and regional revitalization because of their potential to justify rebuilding and upgrading, attract inward investment, encourage tourism, and give host cities new identities.

Table 10. Mega sports events which have been hosted by Qatar source: (psa.gov.com)

Year	Hosted Mega Sport Event	Venues
2004	Asian Handball Championships	1 venue
2005	Asian Basketball Championships	3 venues
2006	Asian Sailing Championships	1 venues
2008	Asian Indoor Athletics Championships	2 venues
2009	Asian Fencing Championships	1 venues
2010	IAAF World Indoor Championships	3 venues
2011	Asian Football Cup	2 venues
2012	Asian Shooting Championships	1 venues
2014	FINA Short Course World Championships	2 venues
2015	IHF Handball World Championships	3 venues
2016	UCI Road Cycling World Championships	1 venues
2018	FIG Artistic Gymnastics World Championships	2 venues
2019	FIFA Club World Cup AF World Championships	1 venues

4.1.3 Importance of Sports in Forming National Identity

Significance of intersection between sports and identity has increased prominence of Sports and culture (Baabood, 2008). There is dynamic interactions between identity and sports, “essentiality part of popular culture represents most relevant symbolic and parameters of sports”. Idea of people gathering for certain events, and speak common language to show unity (e.g. team apparel, colorful faces, flag-waving), proves how mega events mimics effects of national holidays and ceremonies, where widespread national enthusiasm is communicated on streets (Baabood, 2008). National identity develops through time in most countries, mostly as

a result of shared language, heritage, and cultural touchstones. When any of these elements are absent, there is a higher probability of conflict between groups. This is when sport comes into the equation. Nothing develops sense of common national identity like a country hosting or competing in major sporting event; it unites individuals in their support for the national team (Ashton, 2010). In terms of enhancing and establishing of sport identity and culture within host countries; Qatar has revealed its national development strategy for the years 2018-2022, which places importance on sport as a key aspect in the country's economic development and international image (QNM 2030).

State of Qatar overall passion for sports has been developing since early ages. Development plans was based on predicting Qatar's specialization as athletics center since 1970's by establishment of first sport stadium in country (Khalifa stadium). Qatar, which views sport as a unifying factor, is building stadiums and multi-purpose athletic arenas in its own country and around the Middle East, for example, Palestinian Territories, Lebanon, and Tunisia. As result, its bold ambitions emphasize its desire to unite athletic interests of Middle Eastern peoples and to inspire a new generation of football fans. Primary development goals and initiatives of the country are outlined as:

- (a) Developing non-elite football structures.
- (b) Qatari non-nationals can participate in tournaments as way of enhancing social integration.
- (c) Country plans for sponsorships for football initiatives in Syrian and Lebanese refugee camps.
- (d) Aspire programs which launched in 2005 15 Football dreams projects throughout Africa and Southeast Asia (UN reports, 2014)

(e) Promotion of women's football.

(f) Devotion of 22 modular stadiums after World Cup ends for developing countries.

Reactions and opinions regarding selection of Qatar to host FIFA World Cup 2022 were critical. European governments, in particular, were dissatisfied with controversial choice not to award tournament to one of countries that represent as "motherlands" of football. Some enraged supporters are arguing opposed time of tournaments, referring into summer heat and need to play in enclosed air-conditioned spaces. Others appeared irritated that this GCC country had been chosen (instead of, example, the United Arab Emirates, whose cities are more well-known and established).

4.1.4 Qatar 2022 FIFA World Cup

Figure below illustrates the seven cities that will be hosting FIFA World Cup; Doha, Al-Daayen, Al-Rayaan, Umm Salal, Al-Wakrah, Al-Khuor and Al-Shamal. Qatar is a small country with a central urban core centered on Doha capital. Doha boasts a well-developed infrastructure, which includes international airport as well as well-equipped hotels and business facilities.

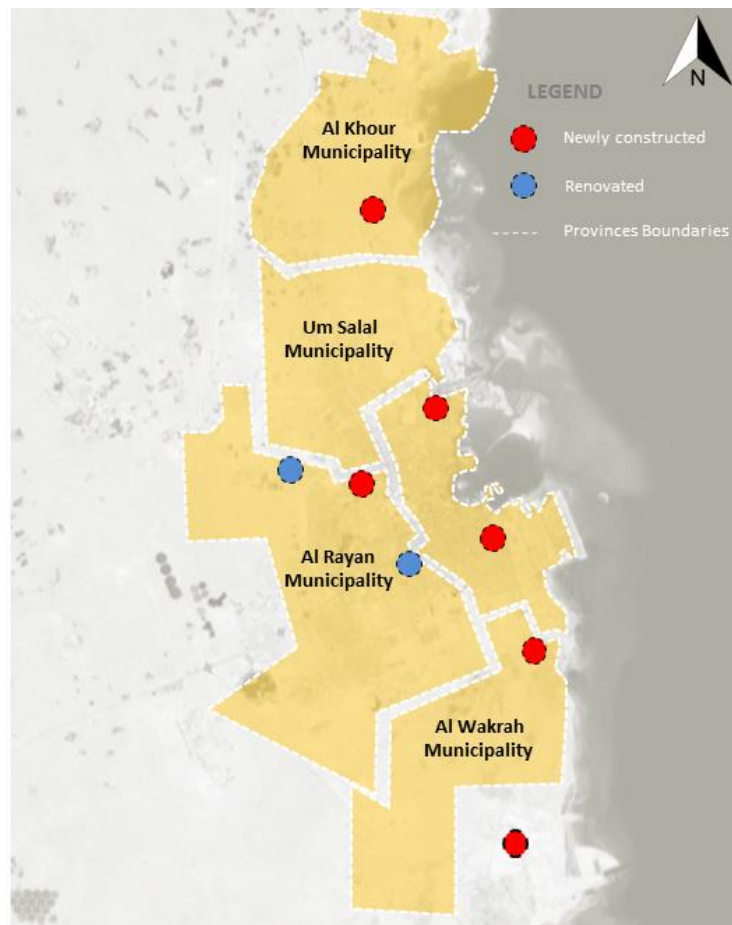


Figure 12. Provinces in State of Qatar that will be hosting world cup event Source: (Google aerial maps edited by author)

4.1.5 SWOT Analysis of the Host Country

SWOT analysis undertaken in this research set groundwork for strategic planning for future host city organizers, while also taking into account shortcomings and issues that previous mega sport event host cities have faced. Furthermore, SWOT analysis used in this study takes step further by using Chalip's leveraging model might to identify what advantages and drawbacks you have. In order for host city to maximize benefits and minimize risks of hosting a sporting event. The SWOT analysis of Qatar is summarized in table below.

Table 11. SWOT analysis of the host country Qatar Source: (established by author)

<p>Strength</p> <ul style="list-style-type: none"> • Well organized strategies and the awareness of the host city organizers of the challenge of hosting mega events • This small-scale World Cup may encourage a warmer, cozier atmosphere among fans • Because of the host country's location in the crossroads of Asia and Africa, as well as its status as a vital destination for many major European airports, fans from all over the world will be able to attend. 	<p>Weakness</p> <ul style="list-style-type: none"> • Uncomfortable dry arid climate and the intense heat, of the host country • the geographically compact footprint of the country • the host city has no history of hosting a mega football event before thus, the cost of building new sport infrastructure will be massive • workers and humans rights
<p>Opportunities</p> <ul style="list-style-type: none"> • The middle east will be a new heartland for the FIFA world cup thus reflecting its culture and image to the other nations • Branding and image making to the host city • Booming and rising of different sectors of the economic • New jobs opportunities 	<p>Threats</p> <ul style="list-style-type: none"> • The acute scope for wildly increased carbon emissions • Risks of over crowding

4.1.6 Targeted Sport Stadiums

Targeted three case studies are built between 2011 and 2019, located within different urban locations in country, and each stadium has different seats capacity. Since at least 2001, FIFA has maintained stringent stadium guidelines; stadiums must hold minimum of 40,000 spectators, 60,000 spectators for quarter-finals, and 80,000 spectators for opening ceremony or final. At beginning of March 2010, first five prospective World Cup stadiums were revealed. Qatar stated that stadiums will use cooling technology to combat country's harsh weather conditions. After World Cup, parts of stadiums will be prefabricated and donated to nations with less developed sports infrastructure. Stadiums will be designed to reflect Qatar's historical and cultural characteristics (supreme committees of delivery and legacy).

4.2 Urban Context Analysis

4.2.1 Urban Structure Model

Formation of a new urban layout for Doha by channeling growth toward decentralized centralization would be one of the main characteristics of the Qatar national master plan (QNMP) (MMUP, 2010). The national master plan identifies new primary urban centers and sub-centers, which, when integrated with the future implementation of a multi-class, multi-mode public transport systems will make up the core of the future Doha. Figure below (see figure 9) illustrates urban structure model of Doha metropolitan which consists of main urban centers and sub-centers. Most of these urban centers represent core focal urban spots that is accommodated with adequate number of community facilities and amenities which allow users to avoid long commutes to main downtown centers.

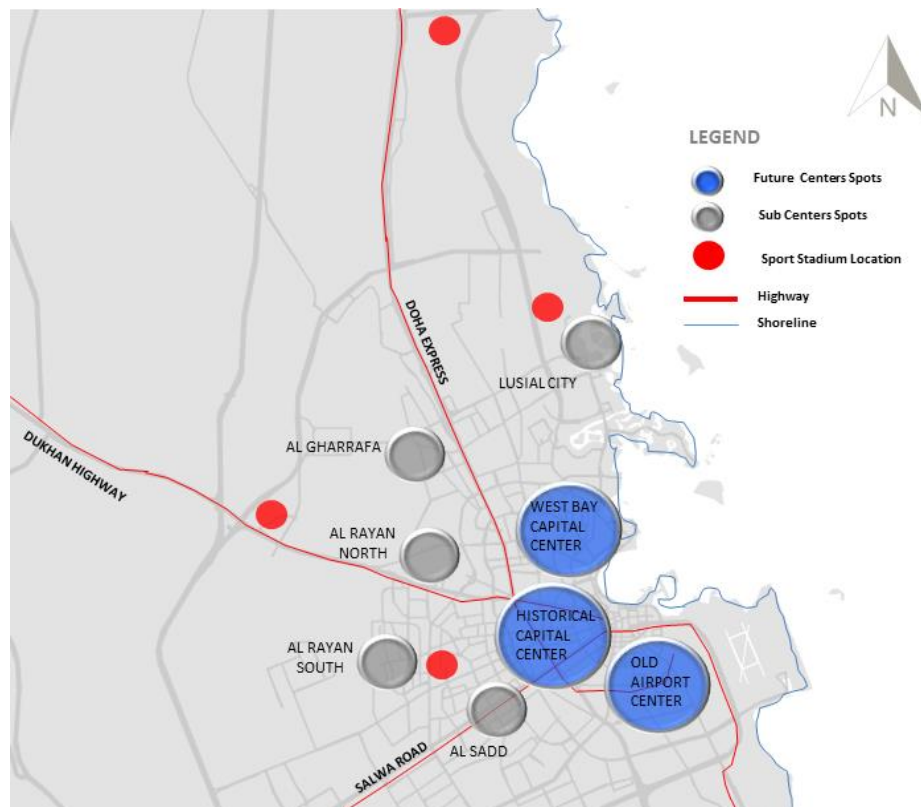


Figure 13. Urban structure model of country from Qatar national master plan Source: (Google aerial maps edited by author)

4.2.2 Population Density

Visual inspection of population distribution using block group data in three targeted host cities shows that total number of users within areas surrounding stadiums widely varies. Figure 7 below illustrates population density distribution at block group level in 2015 within Doha municipality, Al-Rayaan and Al-Khour municipality, as well as location of each sport stadium built within it. Block groupings with high density are scattered mostly throughout Doha municipality near to downtown areas, since highest density block groups in Doha municipality appear to be clustered near city center and shore line. Block groups surrounding Al-Rayaan municipality and Al-Khour are relatively low density. This implies that residents who live outside of downtown districts but seek out to attend competitions at stadiums in

other municipalities/cities must use a private means of transportation to access stadiums since not all of stadiums locations are connected to main public transportation system. However implementation of means of transit transportation modes is crucial that allow users to access stadiums from nearest public transportation station.

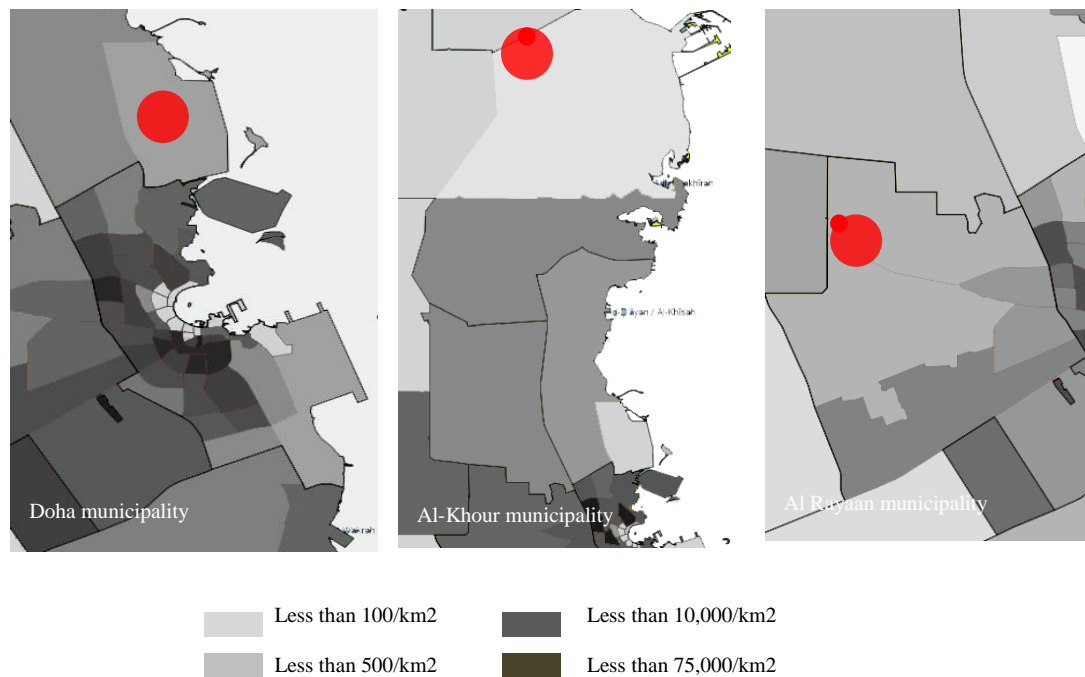


Figure 14. Population densities of groups in targeted host cities Source: ((citypopulation.de) edited by author)

Map illustrates locations of targeted studied stadiums, related to block density of urban context they were built within. This highlights importance of a well-studied choosing of stadium locations. High density block groups distribution within and around Doha municipality compared to other municipality is recognizable from maps below, since Doha municipality appears to accumulate clusters of higher density block groups. This relatively longer commute for people attending games at Khalifa

stadium and Lusail stadium from different municipalities. This pattern also shows that prior to each stadium's construction; Khalifa stadium had larger potential customer base in closer proximity than other sport stadiums located within less dense zones. Maps below -figure 7- show block clusters with higher density near Lusail stadium than stadiums located in other municipalities like Al Rayaana and Al-Khour.

4.2.3 Infrastructure and Transportation

Major transportation system has been implemented to urban fabric of country in Qatar established for preparation for 2022 FIFA world cup. Qatar National Vision 2030 mention that transport systems will be well integrated, accessible and inclusive for all users within different parts of country. These transportations systems include; light-weight rail transit, air links and Hamad International airport. Transport infrastructure which will be utilized throughout 2022 FIFA World Cup was already planned before Qatar winning rights to host tournament, aligned with aims of (Qatar National Vision 2030) which targets to set country into long-term economic development strategies.

Parking facilities availability enhances accessibility to sports stadiums. Usage of automobiles has expanded dramatically in recent decades in Qatar, necessitating provision of sufficient parking spaces for guests. Due to high cost of land, parking spaces are quite expensive, as a result, it is more feasible to build sports stadium outside of city center, where land costs are lower and as well as possibility to build sports stadium alongside a motorway. Construction of high-capacity sport stadiums in subareas is more beneficial only in case of presence of adequate infrastructure and public transportation that connects places that are deemed comparatively far away from major downtown.

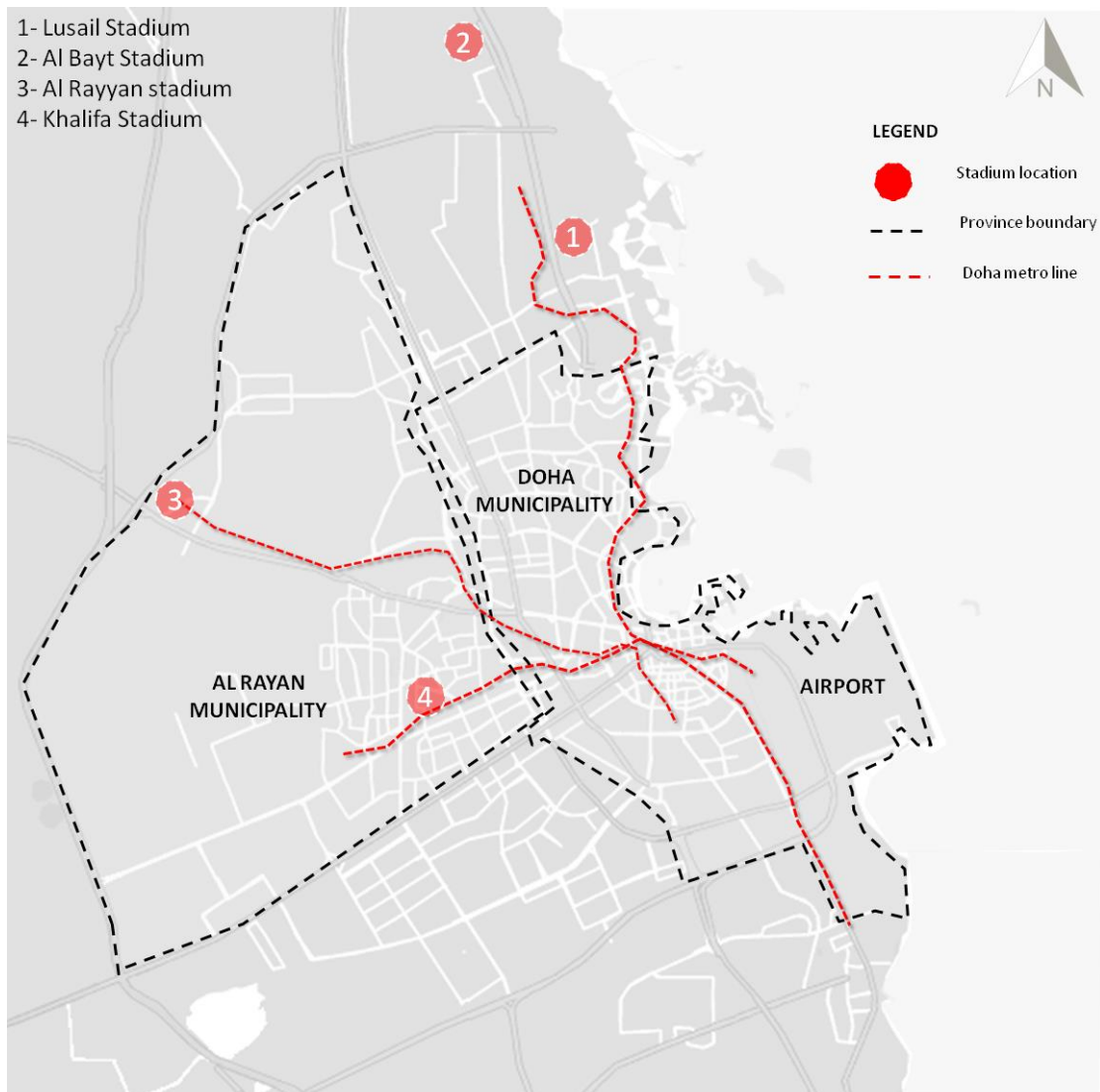


Figure 15. Location of sport venues aligned with Doha metro line Source: (Ministry of transportation, edited by author)

4.2.4 Accommodations

Abundance of accommodation choices round sport stadiums has been implemented, in Al Rayaan municipality, Al Wakrah and also new town of Lusail (supreme committees of delivery and legacy). Country has updated transport systems with objectives to allow each user to reach tournament venues at intervals of an hour. Convenient and short trips enhance accessibility and thus draw visitors from round globe. Table below shows Qatar 2022 World cup non-competition venues, Existing

and planned rooms within 100 km of host cities. Selections range from luxury hotels, low prices and basic accommodations.

Table 12. Total of guest rooms planned within host cities Source: (2022 FIFA world cup, bid evaluation report Qatar)

Host city	Total number of planned rooms	Total number of existing rooms
Al-Daayen	12,000	0
Al-Khour	1,000	0
Al-Rayaan	3,000	1,000
Al-Shamal	530	0
Al-Wakrah	13,000	27,000
Doha	20,000	17,000
Umm Salal	6,000	0

4.2.5 Land Costs and Real Estate Economy

Boost in population growth rate in country resulted in increased demand for land in and around urban areas, which also caused dramatic increase in land value. Land-values had stable rates of prices over long periods, because demand was not high since population growth rate has not increased to any substantial degree, as well abundance of vacant land. Vacant property, however, does not mean that there have been no claims to it. Usually large plots of land were claimed by clans and tribal groups (Qatar Yearbook 1978-1970).

Further research is required into ways and means by which individual property rights have been recognized since it is basis on which present claims and accelerated sharp increase in land value beginning in sixties and continuing to present.

For example price of square meter in Kuwait city rose recently from about \$US 35 to \$US 450 in matter of one or two years. In high-class suburbs meter is sold for \$US 900. Comparatively in central business district of Doha, value of a square

meter is calculated at \$US 1,000, same implications applies to all Gulf major cities (El-Mousa, 1980).

4.3 Analysis of Morphological Characterizations

4.3.1 Site analysis of Targeted Sport Stadiums

Purpose of this assessment is to highlight potential locations for football stadiums in case study area (State of Qatar) through studying urban structure model of host cities of world cup 2022, land costs and real estate values, and infrastructure and community services distribution. Density model is used analysis urban structure model of country and thus determine each type of site location of sport stadium.

Targeted four sport stadiums are built between 2010 and 2019, located within different provinces in country, each stadium has different seats capacity. Following assessment will answer questions like: what are appropriate locations to construct new football stadium in cities (in general) and particularly in case of the State of Qatar? How selection of each site location of targeted sport stadiums will affect legacy plans and re-use of stadium structure after mega sport events. It is crucial to analyses factors that affect choosing locations of sports stadiums in order to answer these questions.

Investigation and studying of factors established in previous section of research, will enhance and influence the process of decision making on where to build new football stadiums within cities, and will examine adaptability of site locations that were already selected for new football stadiums constructed for preparations for world cup 2022; noting that it will be first of its kind event in gulf region. Potential locations for a new football stadium within case study cities are discussed in section below.

Potential Locations for sport Stadium: Developing suburban regions is justification of government for stadiums locations that is distant from city core.

Noting when distance between city center and land decreases, price of land is relatively low. However, this observation is not applied to all host cities, since each city has different urban structure model. Urban structure models show that there is no clear urban structure applicable for every city.

In urban realms concept, a placement near transit routes is possible, but location in suburban region is desired. According to data collected from football stadiums, majority of football teams are relocating out from city center and toward outskirts. Locations near highway are favored, whereas location in suburbs is still uncommon. In case of Qatar, it is critical to choose location for sport stadium and well balance between two important factors; land value and cost of implementing new infrastructures to areas where there are no existing ones (whether football stadium should be built on inexpensive land or near public transportation).

Locations in proximity of the airport: After investigating urban structure model of Doha city figure 7 in order to set possible location areas, it is possible and adaptable to locate sport stadiums along transportation routes and near to airports and hubs. Possible potential location would be in Doha city, along the high way of Ras Abu Aboud Proximity of both Hammad international airport and Doha international airport. However land prices are relatively high in this area due to its proximity to shoreline and significant urban spots. High accessibility and connectivity of these areas makes it more convenient location choices in addition to availability of existing amenities and services in area such as hotels and commercial centers.

Location along the highways: Locating sport stadiums along Highways such Dukhan road and Salwa road, although these locations do not offer well -functioning public transportation but considering future expansion and enhancement of Doha light rail and metro lines make these location adaptable for construction of multi-purpose

sport stadium. Noting that this will be enhancement to these developing areas in terms of availability of services and low land demand. Land prices are relatively low in these certain spots along the High ways. Another advantage of this location is that area along highways is considered almost rural area which means that no residents or land owners have to be relocated.

Location in suburbs: Possible potential locations for sport stadiums in State Qatar could be suburbs at northern and eastern side of country. Despite lack of adequate of public transportation and difficulty in reach-ability to place, relatively land prices makes suburbs an appropriate potential location for sport stadiums. Availability of large sized vacant plots makes it feasible option for sport stadiums structures, since it allows possible future expansions of sport stadium building.

Each project is special and there will be numerous characteristics for each site. In order for project goals to be met, site locations should have certain requirements, whether from a minimum land size, land cost, building design, safety and protection.

More communication with public authorities and other stakeholders interested in site procurement or land ownership at this point process of choosing site location for stadium would allow for more open discussions, thus increasing quality of planning process relating to site chosen.

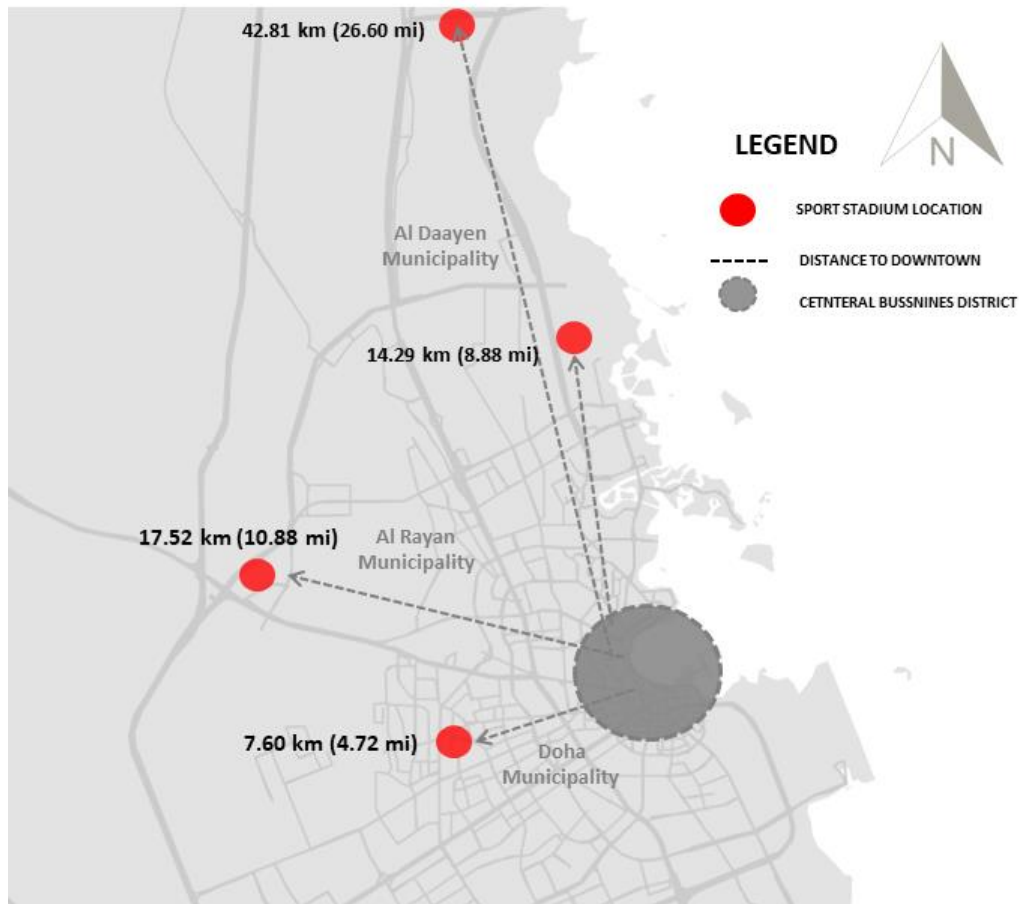


Figure 16. Targeted case studies of sport stadium location related to downtown Source: (Google satellite map edited by author)

Relating to figure above, comparison has been conducted between sport stadiums that will be newly constructed or renovated in State of Qatar in order to explore relation between capacity of sports stadium and land costs. Costs of building football stadiums are listed in Table 13 below. However, land expenses account for significant portion of construction expenditures. As a result, it is reasonable to deduce that land costs rise as capacity of a football stadium grows.

Table 13. Comparison between stadiums constructed in period 2011-2019 Source: supreme committees of delivery and legacy (edited by author)

Venues	Capacity	Type of work	Cost estimate
1-Lusail Stadium	80,000	New Construction	\$ 662.00 millions
2-Al Bayt Stadium	60,000	New Construction	\$ 251.83 millions
3-Al Rayaan Stadium	40,000	New Construction	\$ 135.00 millions
5-Khalifa International Stadium	40,000	Renovation & New	\$ 071.00 millions

It should be noted that construction costs also depend on functions sports stadium provides. Some of stadiums listed in table above (see table 13) feature additional amenities such as a grocery, theater, and gymnasium, these added features raise the cost of constructing a sports stadium. However, giving these additional amenities improves the degree of deprivation because profits would increase due to the provision of non-sport related services.

4.3.2 Accessibility Analysis of Targeted Stadiums

Four potential locations were investigated (shown in Figure 10), existing stadium sites at Khalifa stadium, as well as sites at Al Rayaan stadium, Lusail stadium and Al Bayat stadium. Purpose was to evaluate amount of residents who could readily visit each of suggested stadium locations via public transportation. Ease of access is measured in travel time, which includes all time spent on public transportation. This includes hours spent commuting to and from transit stops, as well as time spent switching between routes. This part of study investigates level of accessible of existing and potential sports stadium sites.

Purpose of this investigation is to form results about level accessibility of stadiums locations and proper location selection, as well as assuring infusion and blending of stadiums with different part of city in a way that contributes to urban

development and regeneration of the urban fabric. Check chapter 2 for the methodology method used to conduct the accessibility analysis

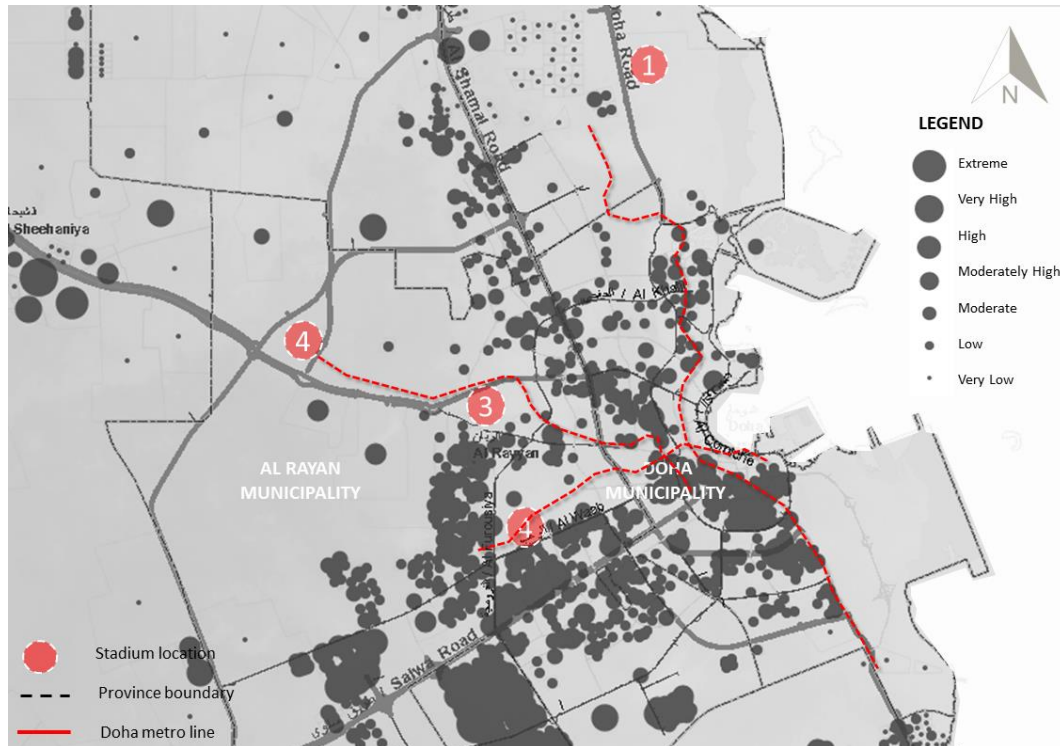


Figure 17. Population Concentration around the stadiums locations source: (Qatar development atlas edited by author)

Figure (see figure 13) above shows concentration of population in State of Qatar at census block level as per the Census 2015. Symbols drawn for each Census Block represent population concentration from very low to extreme categories as seen in figure above. Distribution of population in country has high concentration nature, as seen from distribution of dots in map. More than 80% to 90% of population lives in just 10% to 20% of total geographic area country. Distribution of population has primarily been confined to areas that are well developed in infrastructure; few coastal areas and areas along major transport routes. Most populated areas Doha and Al Rayaan.

Table 14. Comparison of levels of accessibility in each stadium Source: (established by author)

	Accessibility	Land-cost	Location Type	Intangible factors
1-Lusail Stadium	Strong	High	Town center	Adjacency to shoreline
2-Al Bayt Stadium	weak	Very Low	Suburban center	Distant to airport
3-Al Rayaan Stadium	medium	Low	Town center	Undeveloped surroundings
4-Khalifa Stadium	strong	Very high	Main center	High dense of the surroundings

Table 15. Public transport accessibility of Qatar provinces populations to stadiums

Sport stadiums	Zone no.	Population		Accessibility level		
		Zone	Municipality	High	Reasonable	low
Al Rayaan Stadium	Zone 51	56,0027	605,712			-
Lusail stadium	Zone 69	1,338	54,339		-	
Khalifa Stadium	Zone 54	24,593	605,712		-	
Al Bayt Stadium	Zone 70	53,001	54,339			
Education city stadium	Zone 52	18,433	605,712			-
Al Wakrah complex	Zone 90	87,970	299,037			-
Ras Abu Aboud Stadium	Zone 28	1,731	956,457		-	
Al Janoub Stadium	Zone 90	87,970	299,037			-
Aspire Zone	Zone 54	24,593	605,712			-

Table above summarizes population data (sourced from Qatar development atlas online platform) of residents that could access proposed stadiums locations in State of Qatar, within different catchment areas, starting from smallest administrative units division which is zones (in case study) to municipality level in which targeted sport stadium is located.

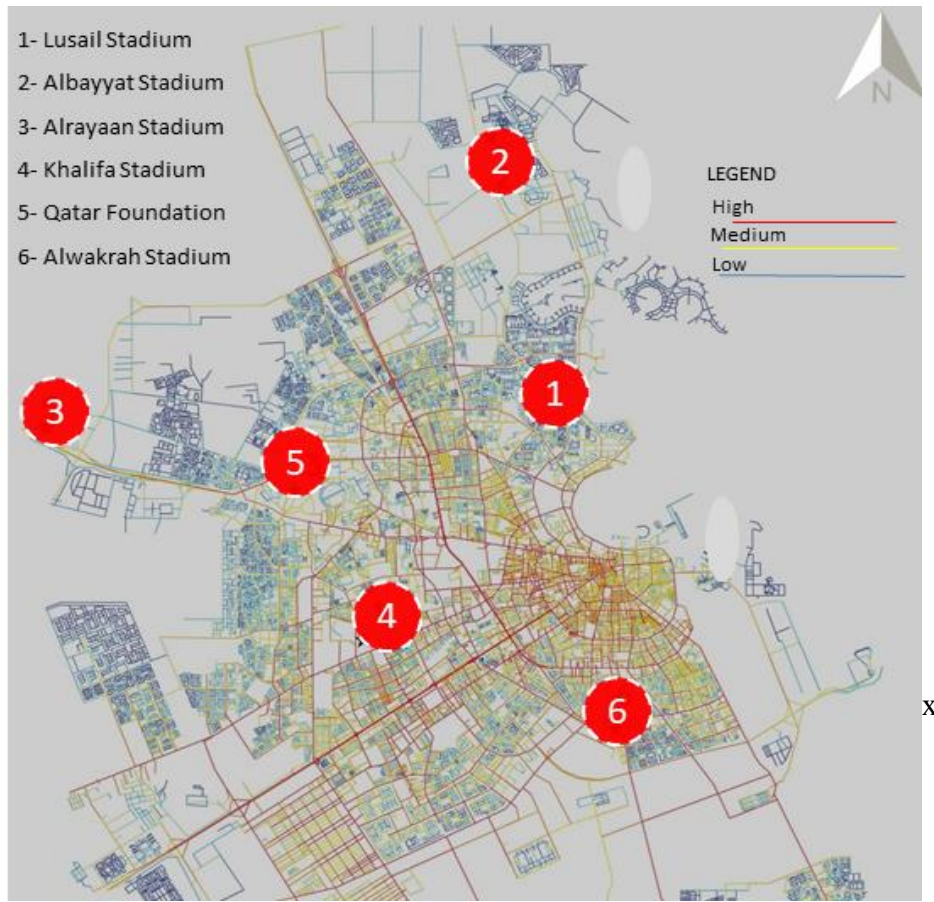


Figure 18. Level of accessibility of stadiums according to space syntax Source: (unknown edited by author)

Figure above –see figure 14- illustrates level of accessibility to location of stadium according to simplified map adopting space syntax theory; Hillier and Hanson (1984) invented the term "space syntax," which refers to a set of theories and methodologies for assessing spatial configurations. Site locations of stadiums located within short distant to main urban centers are restively in higher accessibility than stadiums located in relatively far distant from downtown, which validates data summarized in table 12 which analysis level of accessibility of each stadium according to site locations types outlined by theoretical frameworks. Integration of sport stadium structure to urban fabric should be enhanced by increasing levels of

connectivity of each stadium to different components of city through enhancement of adequate public transportation line.

4.4 Case Study 1; Lusail Stadium

4.4.1 Introduction

Lusail is situated 15 km north of central Doha; planned city Qatar located along coastline, in northern part of Al Daayen municipality, north of West Bay Lagoon, on surface area of over 38 km², and will provide infrastructure to accommodate 450,000 people (supreme committees of delivery and legacy, 2011). This new development adapts sustainability-oriented planning methods to most aspects, including tram system, appropriate green spaces, emphasis on human needs and protection of the environment.

Residents of Lusail city will be among targeted users to be served by legacy of Lusail stadium, since Lusail Stadium will be transformed into community space after 2022 FIFA World Cup Qatar, including schools, retails, sporting facilities and health clinic. In order to make way for these new facilities to take place within stadium building and surrounding of it, capacity of stadiums seats will be reduced to less than 40,000 seats; removed structures will be donated to sporting projects abroad.

4.4.2 Site Location Assessment

Site location of Lusail sport stadium is comparatively close to main urban centers of metropolitan of Doha, in addition to its adjacency to shore line figure 14, all of these aspects make land value of Lusail sport stadium in this spot comparatively expensive in comparison to other potential site locations especially that capacity of stadium is high, which technically requires larger sizes of land. High level of accessibility of this site location and its proximity to airport makes it considerably

feasible location check table 4 main factors that contributes to decision making of choosing site location of sport stadiums.

Location of Lusail stadium in center of new development of Lusail city which is consisted of direct connections by roads and a new metro line, allow for stadium to play role of catalyst for physical development growth surroundings. Stadium is located on main axis of master plan, resulting in splitting of stadium precinct into two half, and has nearly circular footprint. Spectators cross moat to enter building through six bridges, which are surrounded by a reflected pool of water. From sea, a pedestrian concourse leads to series of smaller amenity structures and hotel building on stadium's outskirts, site analysis indicates well integration of sport stadium with urban context surroundings.

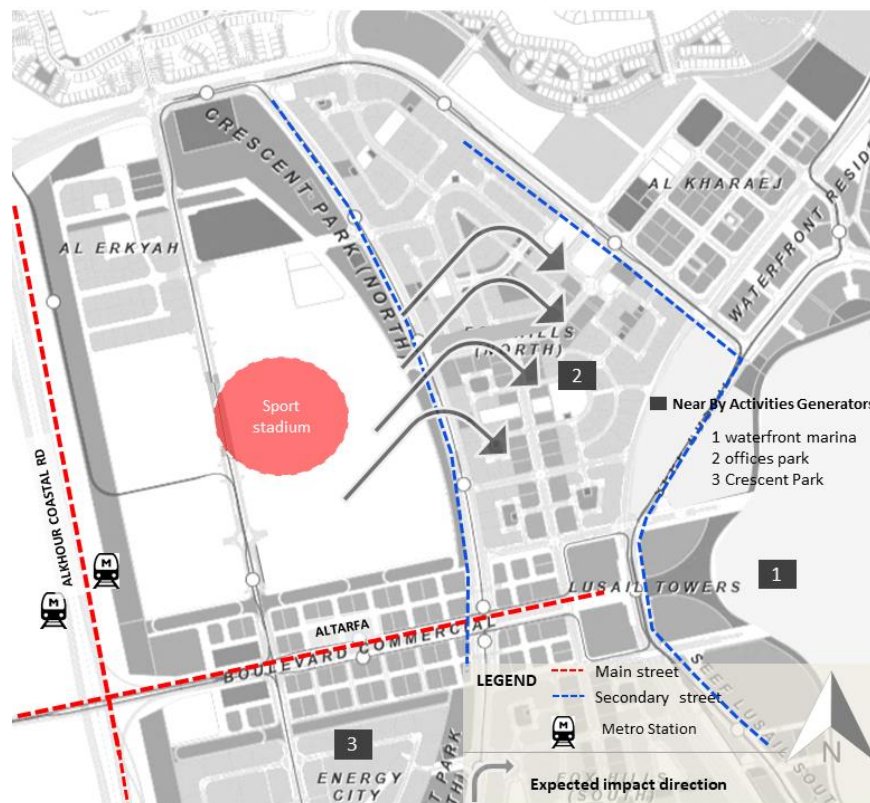


Figure 19. Analysis of site location of Lusail stadium source: (Qatar zoning regulation document edited by author)

Figure above illustrates site analysis for stadium built area and surroundings. Stadium is located opposing main streets which makes it more accessible by public transport with metro station that is connected directly to parking area and main entries to stadium zone. High accessibility of site location of this sport stadium justify and outweighs and high land value. After-use of stadium structure post ending of mega sport stadium (FIFA world cup 2022) is that buildings will be transformed to multi-purpose complex complementing surroundings of stadiums. However larger scale of this sport stadium since it will be visited and used by most of the citizens from different areas of great city of Doha, due to high capacity of Lusail sport stadium.

4.4.3 Physical Development Assessment

Project Impact: Table below (table 16) mentions the mega projects surrounding Lusail stadium after construction of Lusail stadium has started on 2017.

Table 16. Projects established in surroundings of Lusail stadium after construction of Lusail stadium Source: qdvc.com/portfolio/Lusail

Project name	Year opened	Type of activity
Lusail Waterfront Hotel	2016	Tourism
Water front commercial	2016	Retail
Lusail university	2020	Educational
Lusail LRT	2018	infrastructure

Physical morphological related changes have been traced in surrounding areas since Lusail stadiums construction has started. Figure 1 lists major renovation and new construction projects in the period 2017 – 2021 (stadium building overall progress in construction stood at 77%), and Figure 9 illustrates location of these major projects in urban center of Lusail city. In terms of first indicator of urban redevelopment—the regeneration of new blocks, buildings and function diversity (see

figure 2 for indicators) – Lusail sport stadium has catalyzed levels of urban development surroundings of urban fabric. Although most of adjacent structures are newly constructed but still completion of construction of new stadium has triggered development of new activities such restaurants and retails along shore line see figure 14 and figure 15.

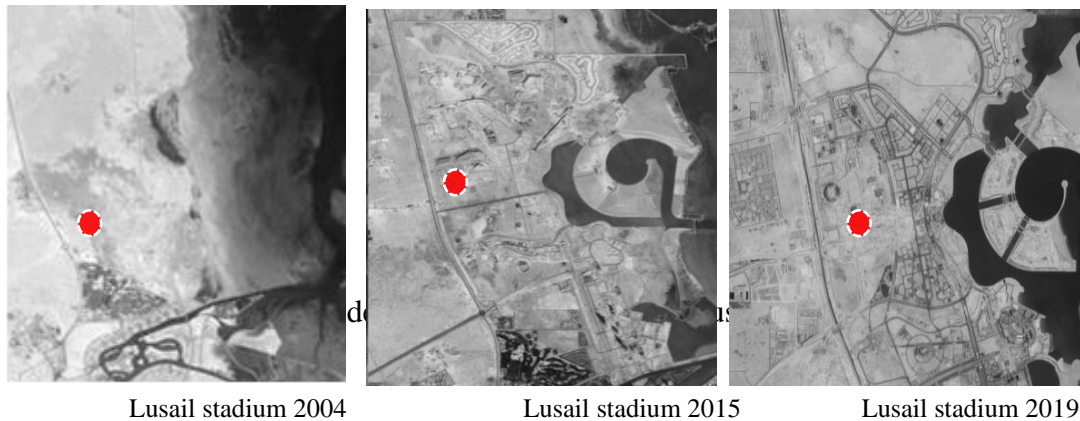


Figure 20: Urban development of the site of Lusail stadium through years Source: (QNMP edited by author)

4.5 Case Study 2; Al Rayaam Stadium

4.5.1 Introduction

Al Rayaam stadium is newly constructed with 40,000 seats capacity. Stadium was built on ruins of location of Ahmed Bin Ali Stadium. After tournament 20,000 of seats will be removed and donated. Al Rayaam stadium location is considered suburban site which is almost at edge of city structure, 15 Km away from Doha main urban center. Al Rayaam municipality area is connected to other important urban spots of country by several means of public transportation including bus lines and Doha metro line.

4.5.2 Site Location Assessment

Location of this sport stadium is comparatively far away from the main urban centers of Doha metropolitan. Al-Rayaan area is considered a town center (QNMP 2030). Low density of most of the zones in this area in addition to site location makes value of land in this location very profitable but still the lack of adequate public transport makes sites locations less feasible since it will require large amount of funds to refurbish and enhance the infrastructure and the transportation. Since efforts were already made by adding a metro station and different amenities and facilities that includes shopping centers and open public spaces. Figure 17 illustrates the main adjacent roads and public transport of Al Rayaan stadium. The area is still developing which makes the type legacy plan of the stadium after the ending of the sport event very critical since it will highly effect the development of the urban fabric of the surroundings.

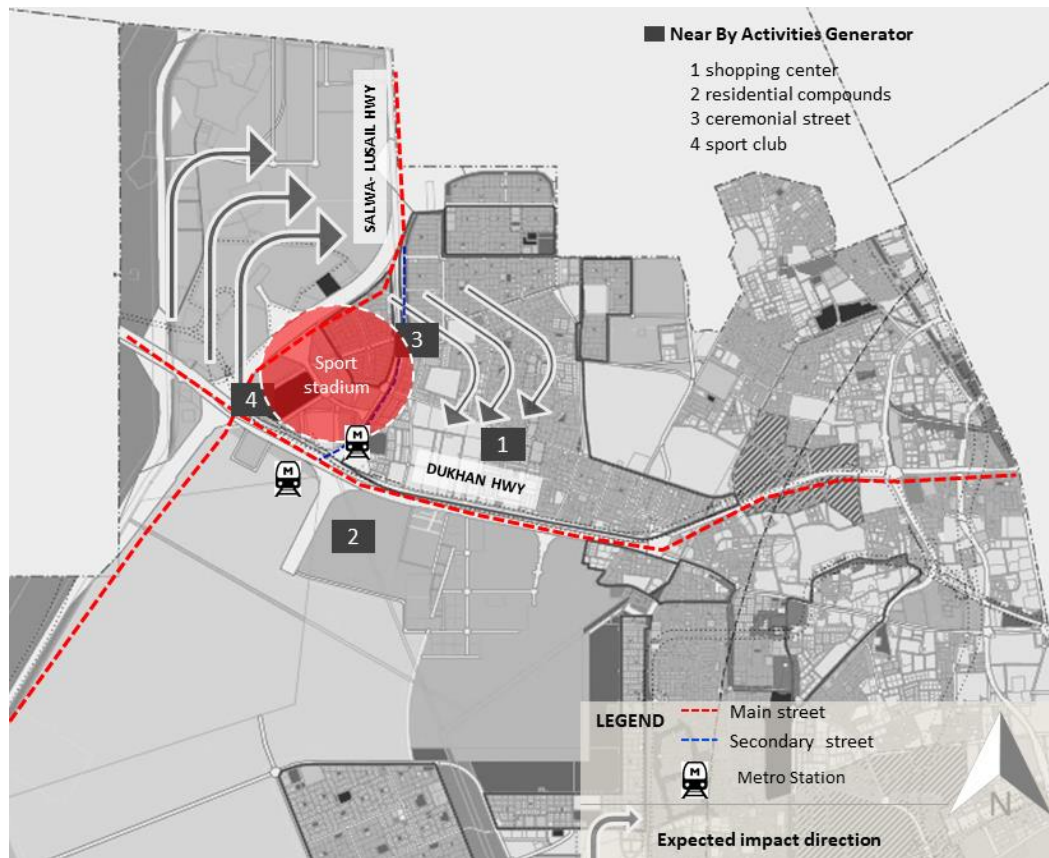


Figure 21. Site location analysis of Al Rayaan stadium source: (Qatar zoning regulation document edited by author)

4.5.3 Physical development assessment

Project Impact: Construction of Al Rayaan stadium has started at 2014 and ended at 2019. Figure below (see figure 18) illustrates the physical development of the surroundings between years of construction of Al Rayaan stadium, which validates first indicators of development of new blocks and buildings as well regeneration of new activities and that includes shopping center that serves users and visitors at metropolitan level. Development surroundings Al Rayaan stadium is also evidenced by recognizable growth in number of residential units at municipality level within

reasonable range of time. Table below (see table 17) summarizes growth in number of housing units in different hosting provinces between period of 2010 and 2020.

Table 17: Growth in number of housing units by occupancy status in 2010 and 2015 Source: (ministry of development planning and statistics)

Municipality	Housing units	
	Year 2010	Year 2020
Doha	157,503	200,542
Al Rayaan	59,661	90,540
Alwakra	14,113	409,206
Um salal	7,156	14,735
Al Khour	8,594	8,594
Al Dayaen	3,251	3,251
Alsheehanya	7,350	12,895

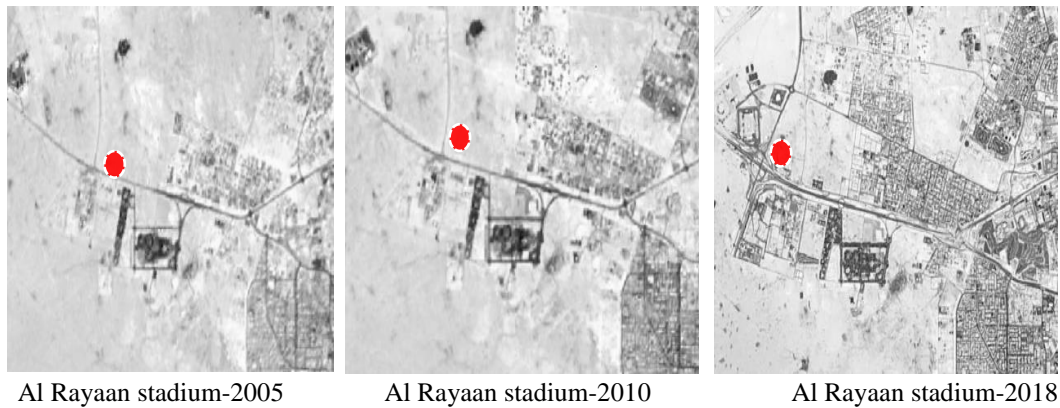


Figure 22. Urban development of site of Al-Rayan stadium through years Source: (Google aerial maps edited by author)

4.6 Case Study 3; Khalifa Stadium

4.6.1 Introduction

Khalifa stadium was built in 1976 (FIFA World Cup Qatar 2022 report), which represents oldest stadium constructed in State of Qatar. In Qatari football, Khalifa stadium has longstanding history. Figure below (see figure 25) shows traces of physical redevelopment occurring within surroundings of Khalifa Stadium between

periods of 2004-2015. In 2003 stadium was first refurbished in preparation for Asian Games; revitalized building is spotted in satellites image from 2005. In order to meet FIFA standards in time for the 2022 World Cup, The stadium is approaching to end its second round of refurbishment. The stadium's initial capacity was 20,000 seats; however, renovation design allows for a 40,000-seat stadium as well as a new refreshments stand.

Furthermore, the possibilities given by the district's mixed-use character, accessibility, and connectivity support the redevelopment of Khalifa international stadium to become a larger stadium by increasing its capacity. Because area surrounding the stadium is a mixed-use sector, demand for accessibility has risen, positioning it at the center of Qatar's modern transport system.

4.6.2 Site Location Assessment

Khalifa international stadium surroundings development and improvement of built environment are obvious, changes is triggered as result of construction of this sport stadium, in addition to provision of amenities and multi-purpose sport facilities attached to stadium (aspire zone) which are used by users from different destinations of Doha metropolitan area. Although site location of this sport stadiums already piled with important urban spots e.g. (Doha zoo) as well as its exposure to highly accessible street Alwaab Street see figure 19 below. Construction of sport stadium has contributed to development of a mixed used neighborhood that has all type of services and facilities including different classes of residential areas, shopping streets and centers, hotels and community serving facilities.

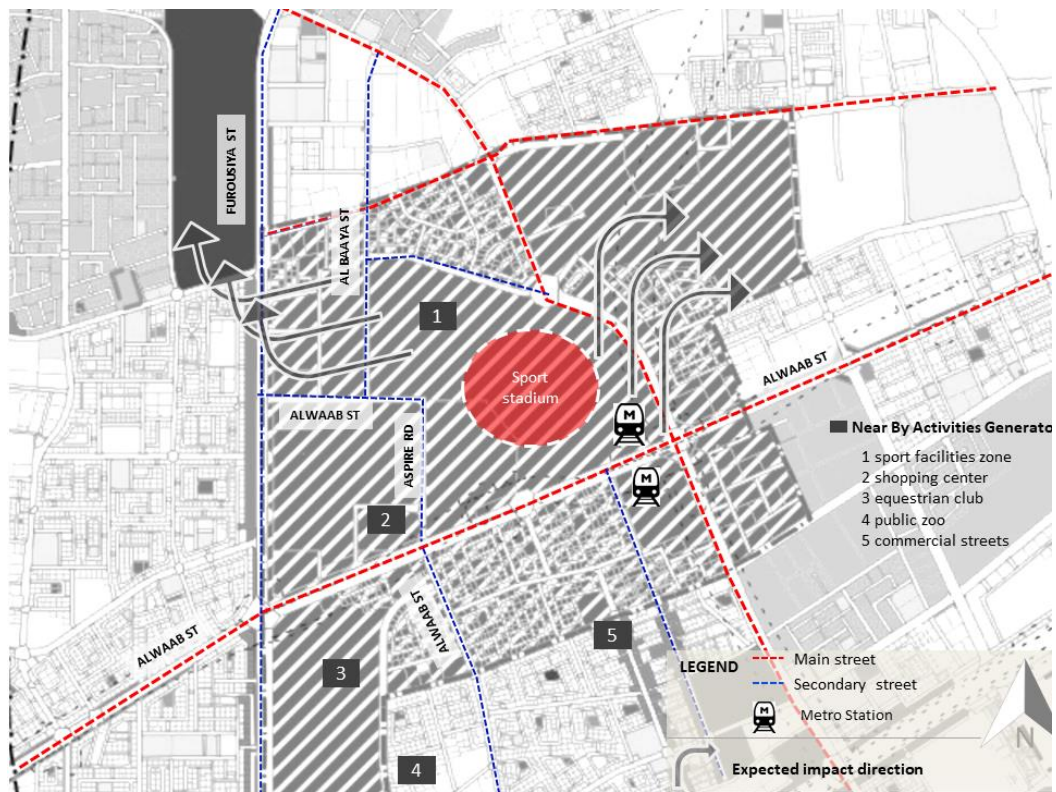


Figure 23. Analysis of site location of Khalifa stadium source: (Qatar zoning regulation document edited by author)

Figure above (see figure 19) shows surrounding of Khalifa sport stadiums. Because it is mixed-use neighborhood, demand for accessibility has increased, placing it at focus of Qatar's advanced transportation network. Al Waab Street and Al Furuosia Street are key main routes between Al Rayaam municipality different areas (north and south). (Bayya) Khalifa stadium district, commonly known as the Khalifa international stadium district, is a key investor in Aspire Zone (Bayya). Aspire Zone is linked to Aspire Academy, Aseptar (Sport Medicine Hospital), Villagio Mall, and the Torch hotel (Qatar's highest structure) in addition to many sports and leisure amenities (Aspire Zone, 2006). Primary issue is dealing with the up scaling of the

Khalifa International Stadium and its associated amenities structures under the low density regulations of Bayya and nearby areas.

The Torch hotel (Qatar's tallest structure) is one of the key urban focal points surrounding the Khalifa stadium, despite its height being in contradiction of existing restrictions that only allow for low building heights and density. Exceptions are provided for a portion of Bayya designated as a special development district (MMUP, 2012); nevertheless, low density regulations in the surrounding district must be adjusted to facilitate structural updates and allow for future growth.

4.6.3 Physical Development Assessment

Project impact: The table below summarizes a numerous of projects which has been developing in the surroundings of Khalifa sport stadium between the period of 2000 and 2020.

Table 18. Major development projects within Khalifa stadium between 2000, 2020

Project name	Year opened	Estimated cost	Type of activity
Aspire academy	2005	46,327,515.93 USD	Institutional
Villago mall	2008	961,538.46 USD	Retail
Aspire Doha	2007	174,387,000 USD	Tourism
New Doha Zoo	2013	20,054,945.05 USD	Tourism



Figure 24. Traces of new parcels and blocks after construction of Khalifa sport stadium

Source: (Qatar development Atlas edited by author)

Figure above illustrates the new buildings and blocks between the year of 2004 and 2015 which shows rising of new buildings and blocks, which as well proves that Khalifa stadium has proven its role as a trigger for physical urban development's according to the assessing framework.

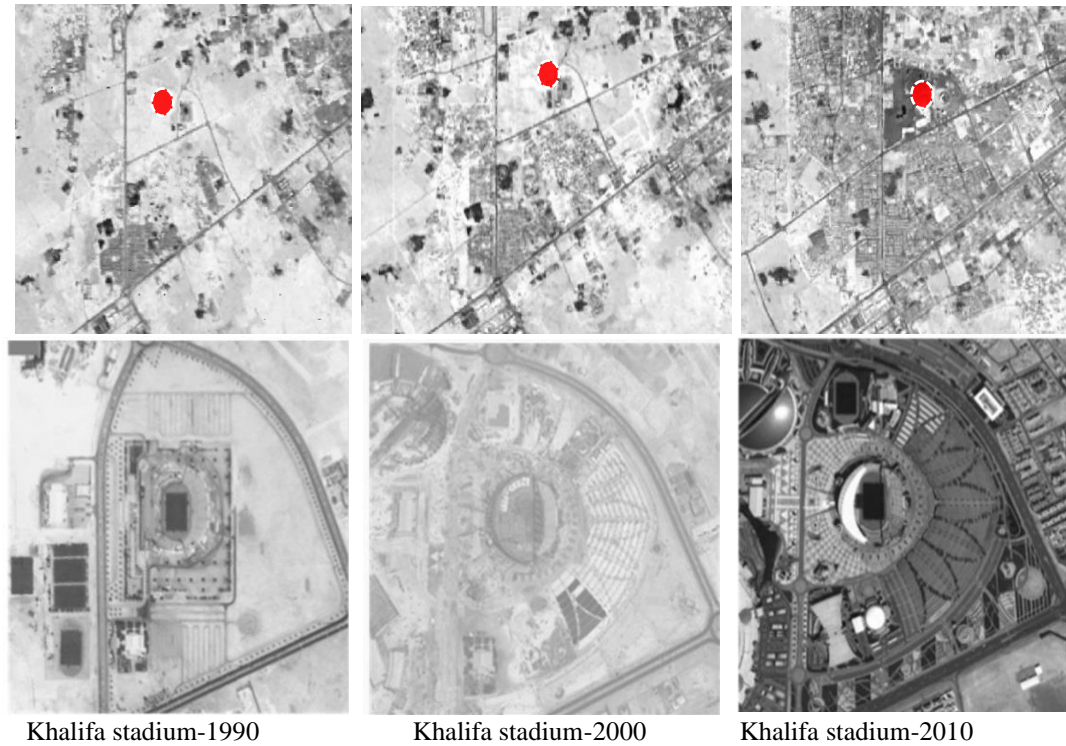


Figure 25. Traces of Development in construction of Khalifa stadium Source: (Google Ariel maps edited by author)

4.7 Case Study 4; Al Bayt Stadium

4.7.1 Introduction

Al Bayt Stadium is a projected football stadium in Al Khour, Qatar, 35 kilometers from Doha's city. It will be completed in time for the 2022 FIFA World Cup. Bhatia, (2015), the stadium was awarded sustainability credentials for green design, construction management, and energy efficiency in January 2020 (FIFA, 2020). The stadium will be connected to a variety of transit options, with onsite

parking for 6,000 automobiles, 350 buses, and 150 public buses/shuttles arriving and departing, as well as 1,000 taxis and water taxis.

Stadium capacity is 60,000 seats, Al-Jazeera (2019) including 1,000 seats for press. Luxury hotel suites and rooms with balconies overlooking the football field will be available at the stadium. The capacity of the arena will be reduced to the benefit of the local community in Al Khour (Al-Jazeera, 2019). Rebuilt capacity will be approximately 32,000, making it more appropriate for post-FIFA World Cup activities and providing space for amenities that will draw visitors to this coastal region. Al-Khour city is classified as suburban city in the country of Qatar.

4.7.2 Site Location Assessment

Site location of Al Bayt stadium is classified as suburban location according to location of stadiums theories. Despite of Al Bayt stadium being the most distant away from the capital of Doha and the airport, the adjacency of location to a main high way (Alkhour coastal road) -see figure 22- enhances the accessibility for users at the metropolitan levels and users of public transportation as there is water taxi line planned to reach out for the stadium.

Direction of impact of Al Bayt sport stadium is apparently towards the shoreline which is relatively close to the stadium, there are evidences of physical urban development tracked through old thematic maps (see figure 22) and the updated data of the surroundings of the stadium. This physical development includes a variable mega projects, as well as traces of rising of new buildings and urban blocks. As well as the spillover of similar activities represented in regeneration of new sport facilities as well as open parks within the surroundings of sport stadium. However the streets network still requires enhancement as well the accessibility of the user's in the surroundings of the stadium should be addressed.

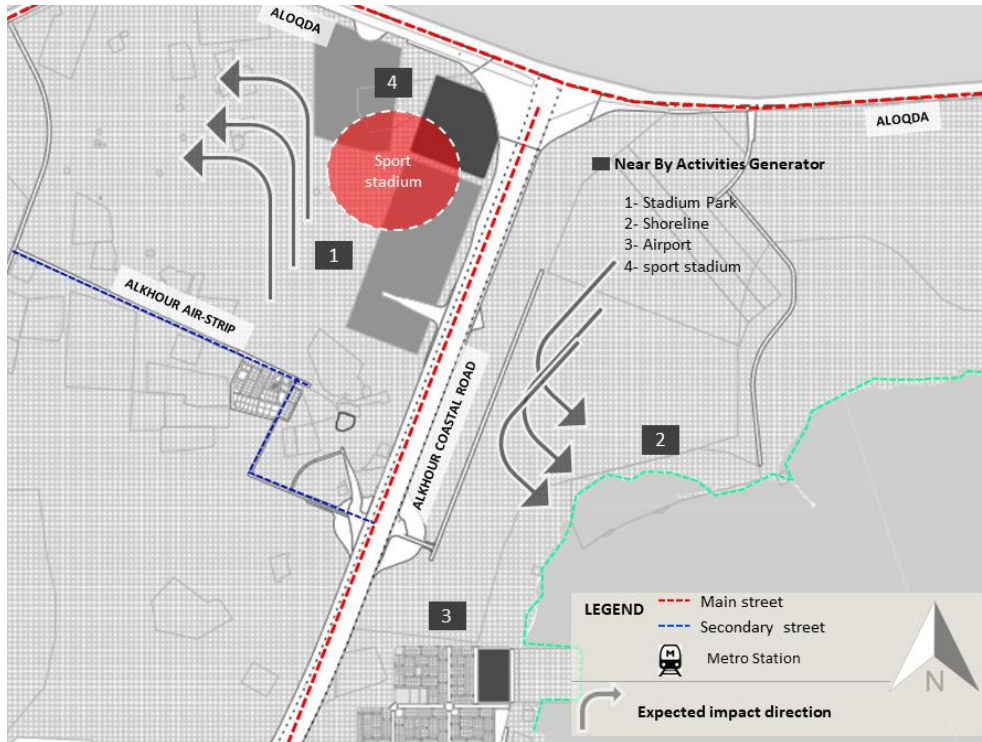


Figure 26. Site location analysis of Al Bayt stadium Source: (Qatar zoning regulation document edited by author)

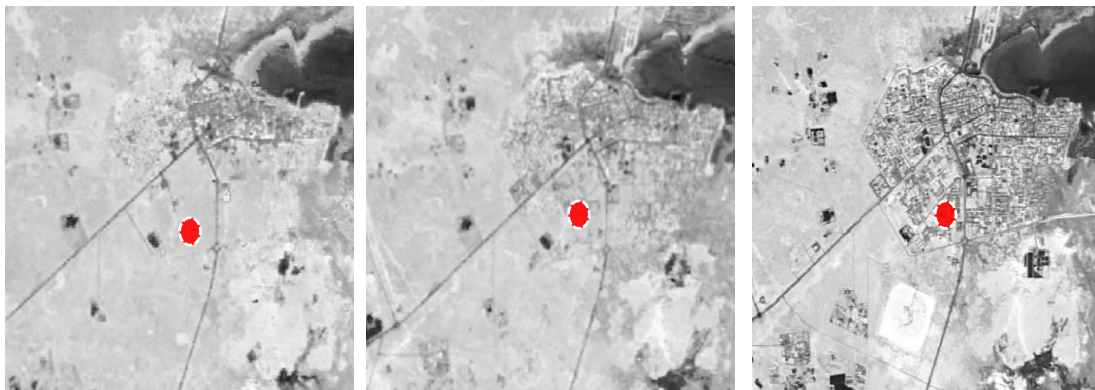
4.7.3 Physical development assessment

Project impact: Construction of Al Bayt stadium has started on 2014 and completion has been achieved in 2020, around this period of time numerous of different projects have been rising in surroundings of Al Bayt stadium. Table below summarizes numerous of projects which has been newly constructed or innovated in surroundings of Al Bayt sport stadium between period of 2005 and 2020.

Table 19. Mega projects surrounding Al Bayt stadium source: Qatar Directory

Project name	Year opened	Type of activity
Al Khour Airport	2008	Infrastructure
Tinbak village	Rehabilitate	Tourism
Al Khour Family Zoo	Renovated	Community facility
Al Bayt Stadium Park	Newly constructed	Leisure Activities

Figure below shows level of development occurring from start of construction of Albayat stadium till the current time. Growth and development of new blocks and street network proves role of stadium in contribution into physical urban development.



Al Bayt stadium-2010

Al Bayt stadium-2015

Al Bayt stadium-2018

Figure 27: Development in construction of Al Bayt stadium and the surroundings source:

(Google aerial maps edited by author)

4.7.4 Summary

comparative site assessments of targeted stadiums clearly identifies that most of locations of newly built stadiums were chosen into respect of its maximum proximity to public transportation which makes accessibility and connectivity one of main crucial factors of choosing adaptable sport stadium location. Aerial maps that shows development of urban surroundings of stadiums structure through certain period of timing before stadium was constructed and during construction and completion shows remarkable development in urban fabric of immediate surroundings of sport stadium, as well the increase of land value and improvements of services and analysis.

Although land prices are comparatively low when moving away to edge of city center of Doha or to other cities burden of provision of adequate public transport

and amenities adds up to overall cost of choosing to locate sport stadiums at edge of the city or in suburbs. Table below shows scaled comparison between targeted sport stadiums location, site assessment and analysis indicates importance of location sport stadiums in sites with well-functioning public transportation with provision of services and amenities. Most of investigated sites of newly constructed football stadium are already located along highway. Football stadiums are also located along railway station Doha metro lines and there is tram connections in some areas e.g. Lusail city. Land cost and accessibility play major role when checking out most crucial factors of sport stadium location. Author can conclude that location of current football stadium provides many advantages, in terms of increasing value of land and improving quality of living experience within its surroundings especially in suburbs locations where urban environment is on developing process.

4.8 Analysis of Legacy Plans

4.8.1 Legacy Plans of Qatar Sport Stadiums

Modular nature of Qatar 2022 world cup sport venues exhibits an understanding of legacy challenges. Ability of designs remodeling will allow venues to be sustainable features that will likely be utilized up in future by other tournament organizers. Major infrastructures projects and amenities surround stadiums aim to guarantee flow of people visiting these venues for long period of time after World Cup is over. Tournament also represents major opportunity to country for advancing; administrative skills, design and construction, projects and facilities management services.

Hosting of 2022 FIFA world cup will open doors to country of Qatar and therefore whole geographic area collection of premier, rising up competence ability of region to be able to magnet future events of these kind. Stadiums will be invested and

used by football teams for Qatar's national league as well as hosting different native and regional sporting and traditional occasions. Most of venues are designed to feature standard styles to permit extra seating to be eliminated when event ends. Prefabricated parts of stadiums including seats units appointed to other countries as intentions of supporting popularity and spreading football round globe. Reduced stadiums capacities can produce arenas with appropriate size for local football matches and teams training, national groups and different sporting events.

Qatar's FIFA World Cup stadiums in 2022 will serve as urban focal points for their local regions. New high-quality recreational facilities, parks, and schools will be built, as well as transportation links, community hubs, hotels, commercial malls, and religious sites. These facilities will aid in the attainment of Qatar's National Vision 2030 development objectives.

New event completion dates, from July to November–December, are one of the most distinct differences between the current event timetable and the first concept.

That was a better option, since it contradicted initial anticipation about participating in world cup tournaments in the Middle East during the summer. Following initial discussions and considerations, a new time event in the autumn between November and December helps to drastically reduce health issues associated with high levels of heat, as well as the expenditure and environmental burden of cooling requirements for all venues structures, including non-sporting venues of the event.

Figure below (see figure 28) summarizes many types of structural legacy plans and how sport stadiums will be used after 2022 World Cup which is establishing standard legacy and sustainability framework to evaluate effects of MSE is challenging Four legacy pillars of QNV 2030 are based on three core sustainability

pillars (ecological, cultural, and economic); three pillars of sustainability in addition to the human component.

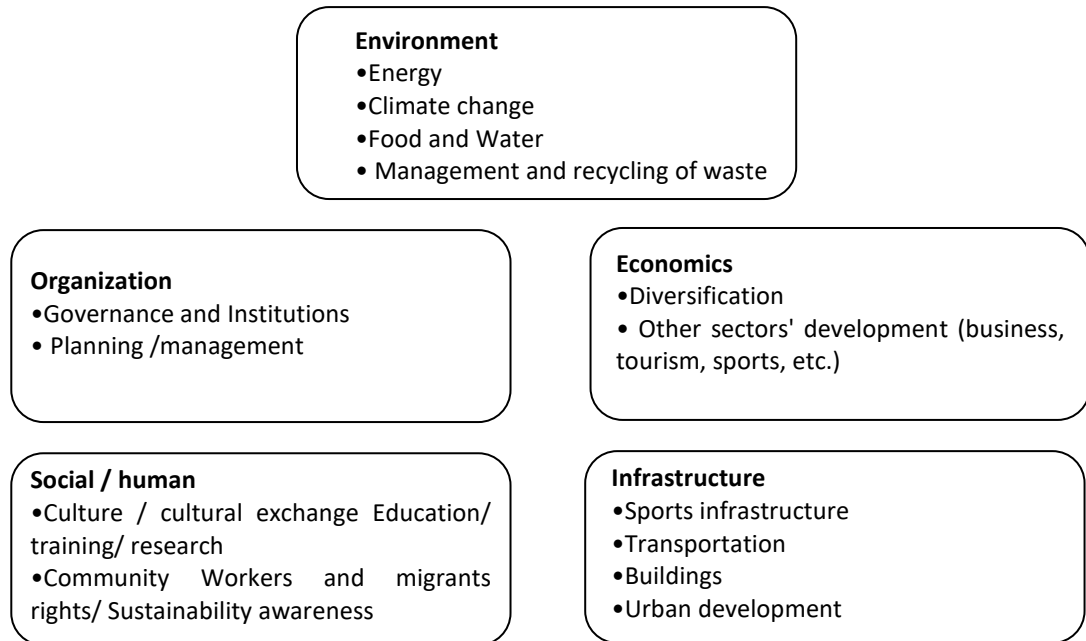


Figure 28. Elements of sustainability for World Cup 2022 Source: (QNMP edited by author)

4.8.2 Post-World Cup 2022 Use of Sport Stadiums Venues

As process of planning for long-term goals of hosting event, country must rethink in details about plans of utilization of stadiums post mega sport events. New implemented functions to stadium structure should infuse and complement urban surroundings of each location stadiums, targeting developing mixed used districts around stadiums that guarantee vibrancy and vitality through different time of year. Table below -see table 16- below summarizes the legacy plans for each sport stadium according to document of the supreme committee of legacy and delivery. Research will investigate in sections below adaptability of these functions introduced in legacy plans. Land uses and zoning regulations will be explored for each stadium location, allowing to measurer to which level new functions were contributing to development of mixed used districts around stadiums.

Table 20. Structural legacy plans for each sport stadiums post world cup 2022 Source: (supreme committee of legacy and delivery)

Stadiums	Legacy Planning
Lusail Stadium	community hub, Schools, housing, shops, cafés and even health clinics
Al Bayt Stadium	A five-star hotel A food court, a gym, and a multipurpose hall are all located in a shopping center. Restaurants and food stalls, as well as parks and play areas
Al Wakrah Stadium	cycling and running tracks New pedestrian-friendly outdoor spaces A mosque, wedding hall and market
Al Rayaan Stadium	regional sporting hub Cricket pitches, football training pitches, an aquatics Centre, tennis courts, bowling alleys, landscaped parks, cafés, fountains, shaded walkways and spas
Khalifa International Stadium	Hamad Aquatic Centre Aspire Zone, women's sports centers
Qatar Foundation Stadium	home venue of Qatar women's national football team offices of non-governmental organizations sports, leisure and social hub

4.8.3 Economic Assessment of the Event Outcomes

Sport stadiums are expensive to build, and such investment is made in hopes of rejuvenating cities or even countries. Owners want to fill the stadiums with as many people as possible in order to sell out tickets and bring in more funds. As a result of this increased demand, stadiums are becoming even larger, resulting in higher construction costs and more materials. With such large investment, there should be expectations that area is used effectively and frequently rather than being left empty. Repurpose these amenities through urban architecture so that they are actually for public's benefit all year. The table below summarizes the project Statement values for each sport stadiums in relation to the capacity and size of the stadium as well as the type of construction.

Table 21. Qatar 2022 World cup venues Source: (Qatar’s Supreme Committee for Delivery & Legacy)

venues	capacity	type of work	cost estimate
1-Lusail Stadium	80,000	New Construction	\$ 662.00 millions
2-Al Bayt Stadium	60,000	New Construction	\$ 251.83 millions
3-Al Wakrah Stadium	40,000	New Construction	\$ 659.63 millions
4-Al Rayaan Stadium	40,000	New Construction	\$ 135.00 millions
5-Khalifa Stadium	40,000	Renovation & New	\$ 071.00 millions
6-Qatar Foundation	40,000	Renovation & Temporary	\$ 287.00 millions
7-Ras Abu About Stadium	40,000	New Construction	\$ 156.00 millions

4.8.4 Legacy plans of Lusail stadium

Lusail is proposed preplanned city in Qatar, located 15 kilometers north of central Doha, on a 38-square-kilometer plot of land in the northern section of municipality of Al Daayen, north of West Bay Lagoon, with facilities to accommodate 450,000 people. Most features of this new development incorporate sustainability-focused planning practices, such as implementing of tram system, ample green space, and emphasis on human needs and environmental protection. Residents of Lusail city will be primary beneficiaries of Lusail historic stadium's legacy after world cup ends.

Lusail Stadium will be rebuilt into communal area following 2022 FIFA World Cup in Qatar, with schools, stores, cafés, athletic facilities, and a health center. Some of stadium's 80,000 seats will be removed and donated to athletic projects to create way for these new facilities to be built within and around the stadium building. To ensure its smooth link with greater Doha and elsewhere, Lusail has a number of city-wide transportation and infrastructural developments. This includes LRT tram, bus, and ferry networks, as well as bicycle and pedestrian facilities. Interconnected circulation between home, work, open space, and recreation locations will be provided by this transit network. Figure below (see figure 25) depicts completely completed transportation network that will service Lusail as a whole, as well as each

district and parcel. By merging its electricity, water supply, surface water drainage, irrigation, sewerage, and telecommunications distribution networks and systems, Lusail's projected road network will serve as spine for its utility infrastructure. All services will be available at subdivision parcel's boundary limits.

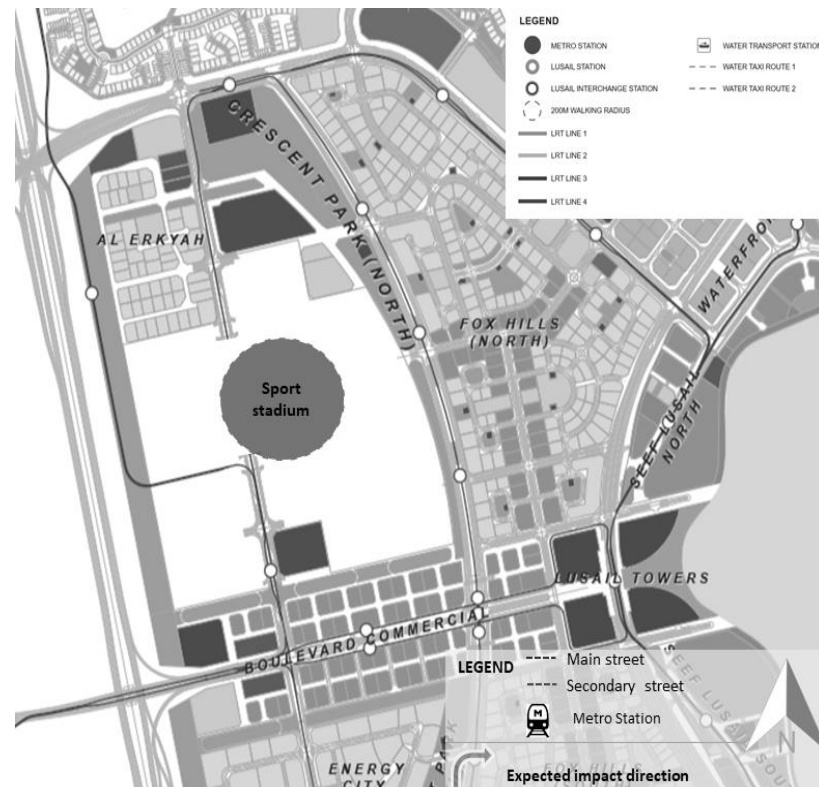
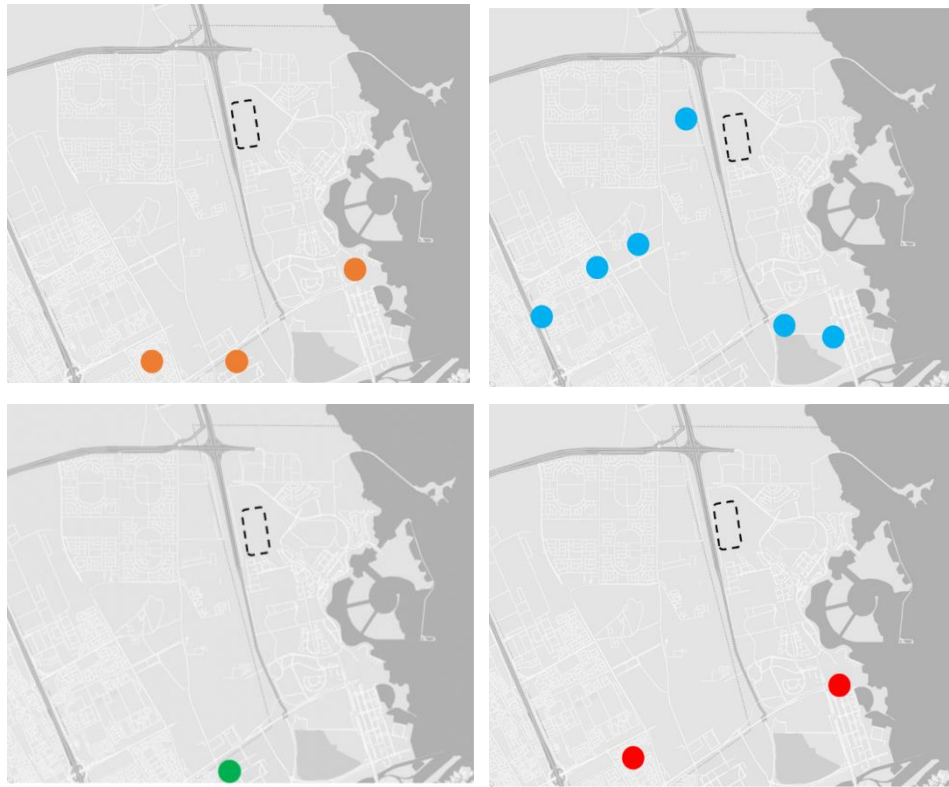


Figure 29. Land-uses of the immediate adjacent surroundings of Lusail stadium Source: (Lusail Real Estate Development Company edited by author)

Figure below (see figure 25) illustrates Lusail iconic stadium existing facilities similar to future legacy plans of Lusail iconic stadiums, maps reflects to which extent legacy plans will be conveniently meeting the needed or missing amenities within Lusail area boundaries.



● Health center
 ● Shopping center
 ● Sport facility
 ● School



Figure 30. Existing community facilities surrounding Lusail stadium site source: (Google maps edited by author)

Figure above Illustrates rendered images mimicking Lusail iconic stadium future transformation after the removal of parts of the structure to accommodate the new facilities. Source: Supreme Committee for Delivery & Legacy.

CHAPTER 6: MAJOR FINDINGS AND DISCUSSION

This chapter discusses and analysis results from assessments of physical impact of sport stadiums through projecting frameworks and conceptual framework established in sections above. Findings outcomes are reviewed in form of emerging themes and guidelines regarding optimizing role of stadiums in urban development according to research.

6.1 Analysis of Morphological Characterization

6.1.1 Analysis of Site Location

This section discuss the result of application of the theories and conceptual frameworks regarding the selection of site location of sport stadiums and accordingly the factors that affect choosing site location of sport stadiums and to which extent these affect the contribution of the sport stadium to the urban fabric surrounding it.

Locating stadiums for Qatar FIFA World Cup 2022: Place dynamic's directors collaborated with the MMUP as part of the Qatar National Master Plan to decide the site of stadiums in preparation for hosting the FIFA World Cup 2022. The small arrangement of venues, especially in the host city of Doha, made the World Cup in Qatar a one-of-a-kind offer. Stadiums are located elsewhere in the country due to FIFA requirements, however they are only a short distance away by public transportation. Fans will be able to travel between arenas using public transportation while staying in a single hotel, which will be both economically and environmentally sustainable. This increased accessibility will enhance match attendance throughout the tournament, but it will also pose a significant challenge to authorities who must move, feed, accommodate, and entertain thousands of visitors inside a relatively compact urban area. People movement around a stadium in the hours leading up to important events is only a minor part of the total people movement strategy for major

tournaments like the World Cup. Importantly for Qatar, the consumer experience they have during the few days they must support their own squad will determine their overall impression of the country.

Apart from stadium design projects like Lusail Stadium, place dynamic is currently working with Qatari government authorities on two major rail and road infrastructure projects to guarantee that fans have the best possible experience from the moment they arrive in the nation. Sports stadiums should blend in with their surroundings whether in an urban, suburban, or per-urban city edge context. To guarantee that stadiums improve their surroundings while also maximizing the benefits that integration may bring to the huge capital investment necessary, stadium planners must take into account the existing context, connections, block scale, urban morphology, and vertical scale. Different stadium types provide different issues in terms of blending into the urban fabric. Stadiums exist in all shapes and sizes, but its main purpose is to provide tiered seating for spectators to watch sports. Figure below illustrates conceptual developed by author to analysis location of sport stadiums according to factors and guidelines mentioned in literature reviews regarding the decision making of selection of sport stadiums site location.

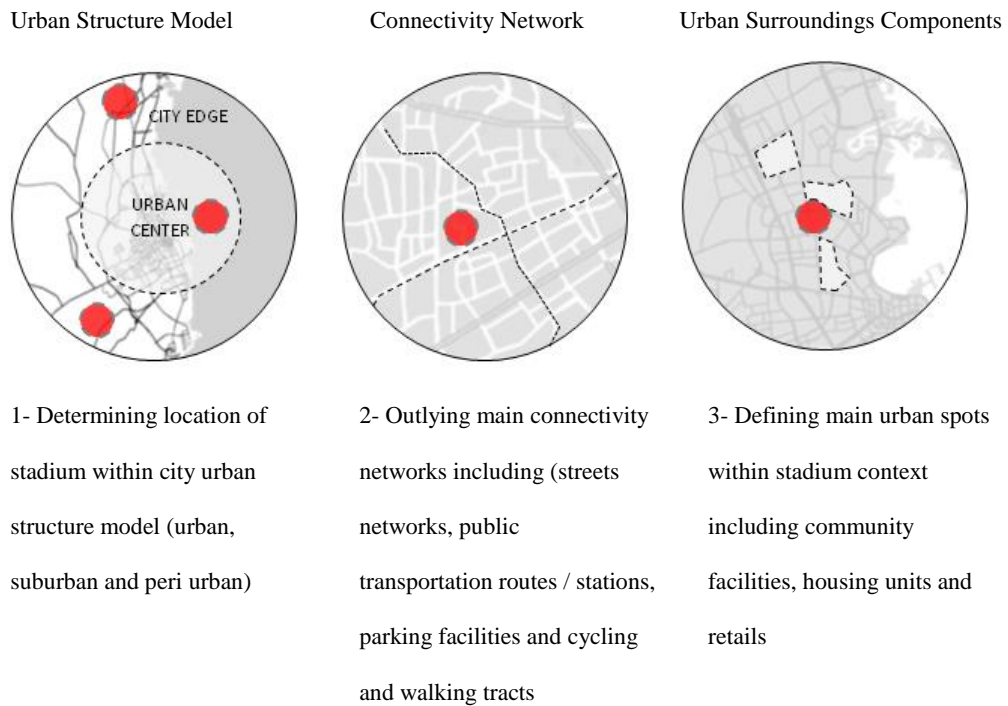


Figure 31. Model of analysis of sport stadium site location within host cities source: (Google areal maps edited by author)

6.1.2 Accessibility Analysis Results

Accessibility of case study Khalifa stadium: Accessibility analysis of the population data within the highly accessible catchment area –zone level- is 4.06% percent of the total population at the municipality level. Which means that the stadium is easily accessed by the public transport systems targeting population within 30 minutes and more, Enhancement should be applied to the improve the accessibility within 5 to 10 minutes catchment areas including transit buses from and into the main public transport systems in addition to improvement of the walking and cycling paths that lead to the sport stadium. Despite of this the stadium is considered highly accessible due to the approximate to the down town area.

Accessibility of case study Al Rayaam stadium: The sport stadium is accessed by 9.2% of the total population of the municipality level, which results in highly accessibility levels for the population within more than 30 minutes, assuming the availability and efficiency of public transport systems. This sport stadium is considered less accessible due to the distant from the downtown area as well as the proximity to airports and hubs. From the analysis above it is highly recommended to enhance the accessibility to the population within the zone level by creating a connected network of green spaces and walk able environment.

Accessibility of case study Al Bayt stadium; The sport stadium is accessed by 97.5% of the total population of the municipality level, despite of this the accessibility level of this stadium is considered low due to the distant away from airports and harbors.

Accessibility of case study Lusial stadium: The sport stadium is accessed by 2.5% of the total population of the municipality level; despite of this the accessibility level of this stadium is considered relatively high due to the adjacency to the most important urban centers within Doha metropolitan area.

From the discussion above the site location of sport stadiums is highly affecting the level of accessibility of the stadium. Other aspects to consider are the quality of the chosen location's public transportation and its capacity to give access to the metropolitan region of Doha's residential population, among others.

6.1.3 Analysis outcomes of Legacy Plans of Sport Stadiums

Learning from different countries expertise of post mega events inheritance coming up with of each competitions and non- competitions venues, since there's growing proof that the educational points from previous major sporting events, each positive and negative, can be helpful and embraced by event bidders and organizers. With a

growing variety of specialists, who have evincible mega sporting event data and skill, governments have access to a large vary of consultants, whom can collaborate to assist to maximize the impact of the precise event.

- Legacy will not go away, the results of the emergence of inheritance is that it ought to be a continuing and distinguished, topic on the agendas of all major sporting event bidders and organizers. In terms of venues, it's necessary for stakeholders to line out a technique, supported associate degree understanding and assessment of the market conditions within which the venue is probably going to work once the event is over, noting that inheritance answer ought to be well planned at the forefront of the look part of a sporting infrastructure construction.
- The importance of conducting a well-studied analysis of the land uses and the facilities within the surrounding context of the sport venues, upon which the decision of the legacy plan will be based on, in terms of land-uses and types of needed facility in the location of the venues, as well the crucially of public engagement in decision making.
- The importance of adopting Temporary solutions, Temporary solution are a sustainable alternative solution. Advancements in technical aspects ought to be at grade that experiencing the event among a short-lived structure will now not be thought of inferior thereto of a permanent venue.

6.2 Assessment of Physical Urban Development

Table below summarizes numbers of completed buildings including residential and structural buildings for the year of 2004 and 2015, between these periods most of the construction or renovation of targeted sport stadiums has occurred. The administrative division used in the summary is the zone level in which the different selected sport stadiums are located. The level of growth in the number of completed

buildings units fluctuates between each sport stadium and another. But the regeneration of new buildings units within each location of sport stadium has notably increased, which is indicates a level of physical urban development in the urban fabric. Figure below illustrates a conceptual framework for assessing physical urban development derived by construction of sport stadiums to urban fabrics.

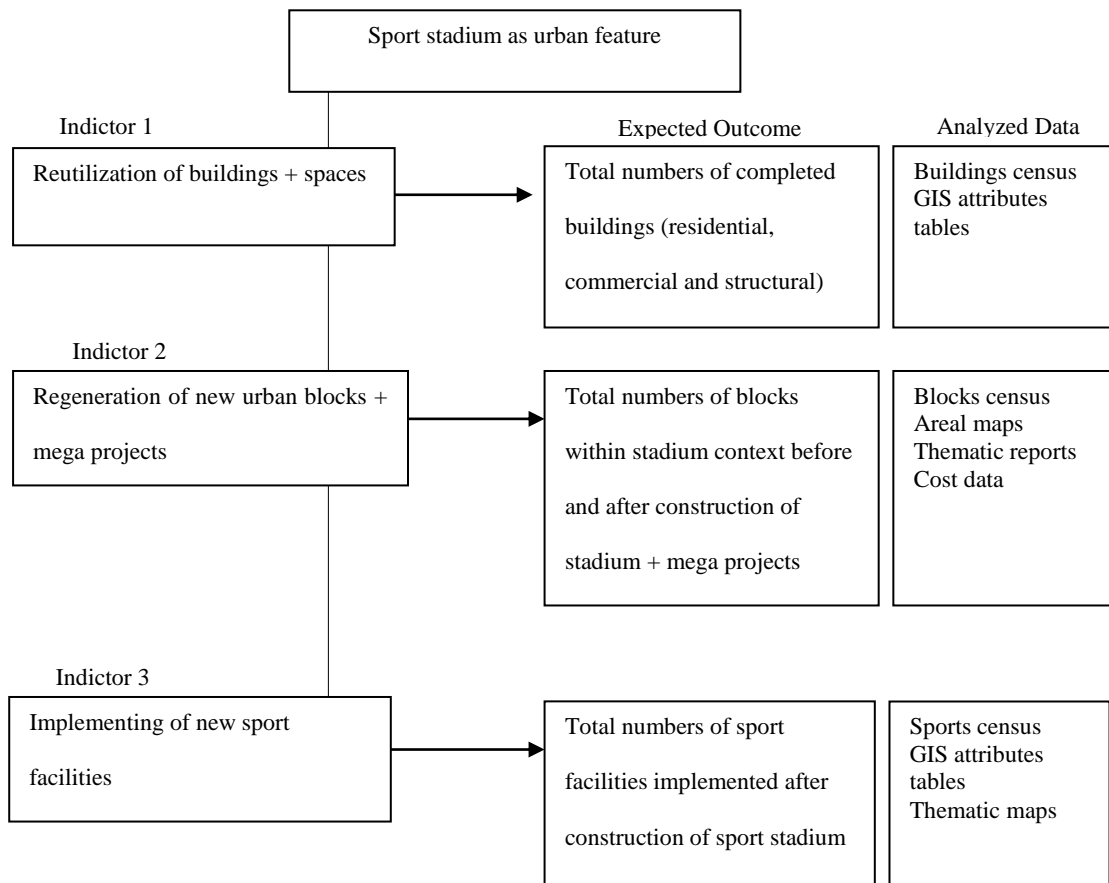


Figure 32. Conceptual framework for assessing physical urban development triggered by construction of sport stadiums source: established by author

Table 22. Completed buildings in the year of 2004, 2015 Source: psa.gov.qa/en/statistics

	Census building 2004			Census building 2015
	Residential Buildings	Structural Buildings	Total	Total
Zone 51	3231	239	3470	12,977
Zone 54	1235	120	1355	4,898
Zone 69	3	7	10	481
Zone 70	618	97	715	8,545

Analysis above summarizes the first indicator of physical urban development which is the use of underutilized buildings and rates of growth in buildings units and blocks. While most of sport stadiums has been located into sites that were undeveloped, most of the buildings units are newly constructed rather than been reutilized. The emergence of new land-uses and activities around each sport stadium – see projects impacts- emphasized the growth rate of each buildings unit in the block and zone level of site location sport stadiums. It's essential for the newly constructed units to allow for integration with the legacy plans that would reutilized within the stadium structure. There should a critical analysis of land-uses maps along with Qatar national master plans to allow for the redevelopment of the missed out activities and land-uses within the urban fabric of the surroundings thus enhancing the development of mixed-used districts.

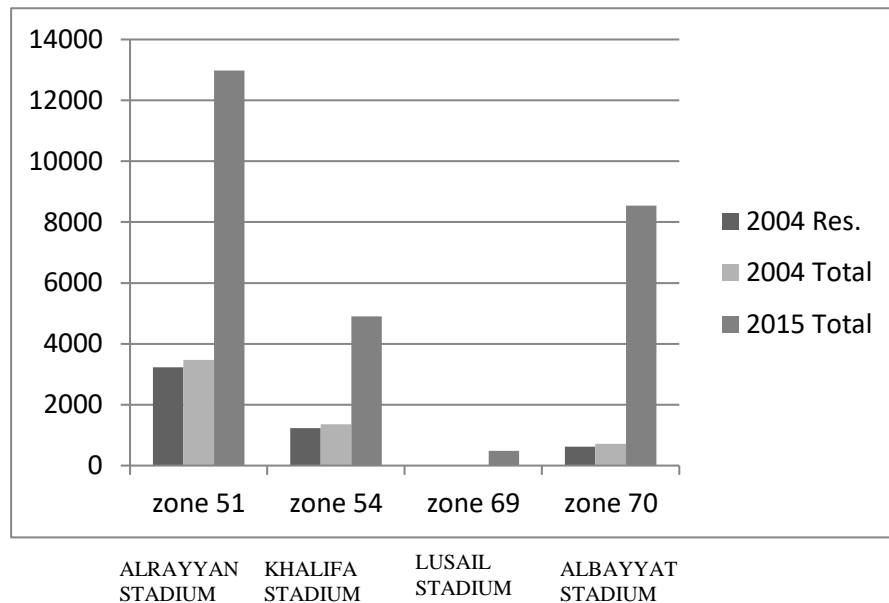


Figure 33. Growth rates of residential units surrounding stadiums Source: (ministry of statics edited by author)

Figure above (see figure 28) illustrates a chart that shows the census of completed units within each zone where sport stadiums are located. Al Rayaan sport stadium and Al Bayt stadium recorded a higher growth rate in the Total completed buildings units, and especially the residential units. growth of residential within the urban surroundings allows for provision of more users and consumers to the sport stadium and the community facilities generated nearby, which as well enhance the livability and vibrancy of the areas surrounding the stadium structure allowing it to infuse with the urban fabric without being an isolated large underutilized spots. Although Lusail has shown a minimum of growth in the number of completed buildings units, but the density of these buildings is considerably high due to the relatively small areas through which the zone expands. The low rates of growth in residential units around both Al Bayt and Lusail stadium should be addressed and improved to higher rates as to allow the development of a mixed used urban fabric

and avoidance of turning these areas surrounding the sport stadiums into ghost cities at night time and outside the game days. Meanwhile general the spillover of activities around certain stadiums is not yet can be seen in sites but the rates of growth in buildings units indicates occurrence of physical urban development in the long term.



Figure 34. Redevelopment of blocks around stadiums Source: (Qatar development atlas edited by author)

Figure above traces newly regenerated blocks and parcels within urban surroundings of Khalifa stadium and Al Rayaan stadiums. Although Khalifa stadium has been part of the urban realm since the 1970, rate of physical redevelopment of urban surroundings has occurred mostly in the year between 2004 and 2015, in which the stadium was renovated, and the spillover of sport activities has been achieved in addition to the redevelopment of so many vacant parcels surrounding the stadium area including retails and commercials blocks. The renovation of the stadium has as well as enhanced rising of many mega projects surrounding that has been underutilized for example Doha old zoo. Since Al Rayaan stadium has been constructed in the site of an old stadium the redevelopment of new blocks and buildings was already on the process before the completion of the sport stadium. One of the main reutilization of vacant lots was the construction of Qatar mall that serves users at a metropolitan level. Both stadiums has triggered enhancement of infrastructure and transportation routes around.



Figure 35. Distribution of sport facilities around sport stadiums source: Qatar development atlas edited by author)

Figure (see figure 35) above illustrates redevelopment of sport facilities around sport stadiums, which validates the third indicator of physical urban development. Khalifa stadium has higher rates of spillover of the sport activity within the surroundings, which proves that the stadium has succeed in role of urban development of area. On other hand little to none sport facilities has been redeveloped around most of other stadiums. However taking a look at sport facilities redevelopment plans and guidelines within Qatar national vision assure each all of zones and municipalities are intended to have variable types of open spaces and number of sport facilities that is just enough to serve low density of some of districts, and that justify low rate number of sport facilities around certain sport stadiums.

6.3. Conclusion

Despite the fact that majority of major league sports teams currently play in new or recently constructed stadiums or arenas, sports facilities are expected to remain important urban regeneration vehicles. Given that sports facilities will continue to be pillar of the urban redevelopment plan, policymakers must acknowledge that these projects only give a limited number of potential opportunities for urban redevelopment.

Experience of State of Qatar, however, indicates district redevelopment is not only guaranteed by massive investments in a sports projects, since in some hosting provinces low rates of urban development growth level has been detected after sport stadium construction in comparison to level of nature developments rates. In another words, that stadiums contribution to speeding up and accelerating developments projects was not pivotal. In other hand some stadiums location has shown tremendous rising in urban development rates, this success is associated with many factors, most

crucial of it is selection of sport stadium in areas with existing infrastructure and facilities.

Low dense of population distribution around some stadiums locations (Al Rayaan stadium) might indicate high serving capacity of stadium related to low demand for that. Such issues should be addressed by means of encouraging high dense and mixed used developments with adequate provision of public transportation systems. Because of the mixed results of these projects, more research is needed to identify the project characteristics and/or planning approaches and programs that result in development benefits. According to research, district-level planning with the specified purpose of stimulating regional development is fundamental to achieve convincing rates of urban developments in host cities.

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