

OLYMPIC GAMES A SUSTAINABLE DESIGN ASSESSMENT FOR HOST LOCATION

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ABSTRACT

Through decades, Olympic Games have become the most spectacular public culture event in modern days. Every four years the Games capture our attention to a grand festive that fascinates millions of people. Accordingly, when a city decides to make a bid, all its concerns is much more captivated by the urban transformation impact on the city whether it's a positive or a negative one. As a result, several factors, if not well-organized and taken into consideration in the strategic development plans of the host cities, may be a burden on the city. Site selection for the event is considered one of the main critical decisions to assure the possibility of the host of the Games by the city. Therefore, this paper reviews several case studies that proved its success in location choice under the delivery of sustainable urban design and strategic planning for the host city. It attempts to mention the main urban design elements affected by the preparation process. Consequently, an urban design sustainable assessment will be developed highlighting both the main urban design factors affected due to the host of the Olympic Games and, the main sustainable key factors affected by the urban changes on site.

KEYWORDS: Olympic Games, Strategic Plans, Sustainable Urban Development, Sustainable Urban Assessment.

1. INTRODUCTION

Mega Sports Events such as Olympic Games (OG) well known for its short-term timing with long-term impact of stage on host city shows a fundamental case of sustainable urban development model in how cities manage the host during and after the event dealing with the consequences caused due to the event [1]. In addition, many cities gain the opportunity to the introduction of new significant urban elements; elements that add new perspective for strategic sustainable thinking process and also

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add or promote the identity of the host city. "It is a kind of natural process where places are transformed in response to the new city needs [2].

Such an event can be conceived as a great opportunity for cities to have a fast makeover towards a sustainable development form says [3-5], giving the opportunity for countless factors such as natural environment, local society, economic status and even more like the governmental thinking to be exposed to the changes affected during the preparation process of the event. In addition, the OG is known as a catalyst for urban sustainability and policy-making [6-8]. Having this said, the OG can be recognized as an urban development act, which can provide a "fast-track" development in different ways such as urban regeneration, infrastructure development, also increase the international recognition of the locality and stimulate economic growth for the host city.

Furthermore, special attention should be paid to the general ensemble of streets and public places of which venues and buildings will form a part. Where possible, buildings should be located so as to permit a generous development of landscape [10]. For this purpose, the site selection of the host location should be considered as a prior choice decision in the strategic planning process for the event. Having said that, places become 'useless' losing their utility and meaning, if not strategically planned and pre-prepared for the future consequences of sudden events, for instance, when it comes to the cause of mega sports event especially the OG. Consequently, in order to cope with the sustainable development plans of the cities' strategic plans and in so doing, Olympic Host cities nowadays, sometimes, intend to integrate its staging plans with its local development plans, benefitting from the stage as much as it through defining main urban strategic tools achieving an integrated fast track sustainable development for the host city. In so doing, this choice should be made in cooperation with local agencies because of its better knowledge with what is the best site choice for the sack of its local community and the hosted event, besides, the governmental cooperation, as well as the supervise authority for the event the International Olympic Committee (IOC).

2. ISSUES, AIMS AND OBJECTIVES

Despite the significant appearance of the Games worldwide and its enthusiastic values and impression, a set no. of concerns expressed by several parties of the host cities organizing members on the amount of expected negative urban impacts caused by the massiveness built mega structure of the Games, which is considered very much equal to an urban development project with a regional scale infrastructure [22]. These issues can be observed in the infrastructure challenges the city faces, or the amount of cost for the preparations of the Games, or even the fear of constructing white elephant venues with non-futuristic plan of use after the Games.

The specific learning points and objectives of this paper are to integrate an explicit sports event into the strategic planning preparation process for cities to achieve sustainable development, highlighting the importance of including sustainable site selection choice adaptable to sudden changes. The researchers also aim to do that, by designing an assessment based on how host locations are affected by multidimensional choice of factors that affects site development. All this will be discussed through a proposed integrated methodological approach in each of the research sections. Section 1 Outlines general list of urban attributes identified on the basis of study of historian periodical time of development of the OG through observation analysis process. Section 2 Understands the principles and attributes that act in relation to the delivery of a sustainable site, pointing out the urban dimensions that will serve as key features to ensure sustainable urbanization. Section 3 Design a sustainable assessment based on the key features of the urban design development of the event to assure sustainable development. All this based on the discussion of 3 successive successful case studies. Beijing 2008, London 2012, Rio 2016 Summer OG. Finally, we included the discussions and considerations needed to prove the importance of the site selection in the achievement process of sustainable development for host cities.

2.1 The Olympic Games and the WH Questions

What: The OG is considered to be a huge festive gathering sports event for youth around the world. It is a spiritual sports tradition whose origin dated back to the

Greek Empire first appeared on the sacred mountains of Olympia, Athens. Then, in the modern times, the Games took a different track for promoting more other values. Its uniqueness and involvement with different social cultural and even economic and environmental aspect changed the Games turning it to a more valuable factor for city development, which will be shown in the theoretical periodic timeline review.

When and Why: The Games where first held in the 776 BC and disappeared in 393 AD in the era of the Roman Empire. Then, in the late 19th century, the Games started to rise again from its ruins after the great discovery made by the Baron Pierre de Coubertin who decided to introduce the Games internationally as the rise of the Modern Games. His passion for the development of education of youth through sports and health, and his belief for the importance of delivering a well-organized sport event could be used to promote international unity and social equality [3]. Thus, he started the establishment of the IOC in 1894. The IOC's main objectives and principles were:

- To foster the goals of competitive sport.
- To provide a legacy of facilities that would stimulate athletic development, and
- To raise the profile of sports involved by providing better opportunities for training well as sites for national and international competition.

Who and How (Organizers and Process): From the above, the OG turned to have solid objectives which couldn't be accomplished without forming and administrative committee to ensure the perfect presentation of the Games worldwide, accordingly the IOC established the Olympic movement whose main objectives whereas follow:

- Promoting sport and competitions nationally and worldwide as well as spreading the value of fair play and sports ethics.
- Providing sports to all mankind through encouraging public and private organization to cooperate in providing sports.
- Promoting the value of "Sport for All". In addition, promoting the idea of women in sports to achieve equality between men and women.
- Raising awareness of environmental problems and how it's important to mankind.

- Financial and educational support for developing countries through the IOC institution Olympic Solidarity.

Consequently, the Olympic Movement established a framework to assist all Olympic Host Games called the Olympic Charter it is a report that attempt to design the IOC law and establish the fundamental principles and values of Olympism, as well as responsible for defining the rights and obligations of the four main constituents of the Olympic movement: IOC, NOC, IF, OCOG. The IOC represents the head of the Olympic Family members, from which there are the National Olympic Committees (NOCs), the International Sports Federations (IFs), the athletes, the Organizing Committees for the OG (OCOGs), other organizational members, and the official recognized institutions. Figure 1 shows the Olympic movement organizational structure highlighting there responsibility bases. To understand more about the OG amount of urban impact on selected site and how site were chosen for the preparation of the Event, we need to understand more how the Games evolved through time.

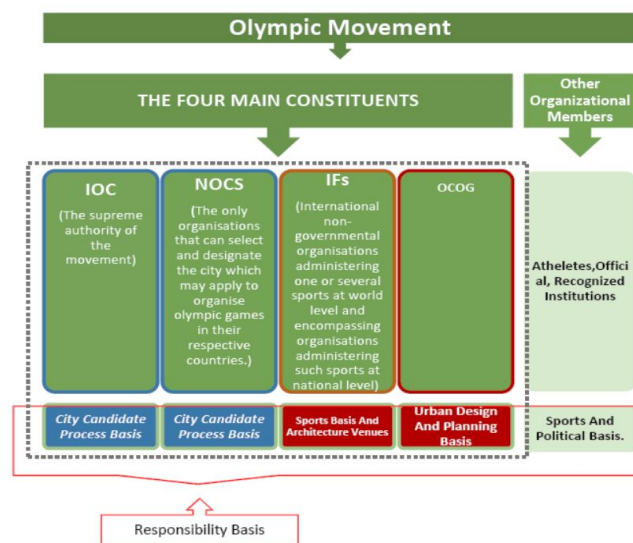


Fig. 1. The Organizational Structure of the Olympic Movement.
Source: Author based on [9].

3. OLYPMIC GAMES INFLUENCES AND URBAN DESIGN SITE INDICATORS

Many studies refers to the Games in terms of spatial fields, economical fields, and even ethical field, each study had its own periodic time of analysis. In our case,

Furthermore, as shown in Fig. 3 the implementation of several kinds of sports caused the construction of several buildings that lead to the expansion of site to hold more venues in one place [11]. The spiritual effect of hosting the games in the first place in Athens on the Olympia Mountain was considered the first paradigm in the OG history.



Fig. 3. The development of the Olympia size through time, [11].

Moreover the historical records show that the Modern Games that we know nowadays started launching its first event, in the 1896 after the formation of the IOC. Having fascinated by the discovery of the ruins of the ancient Olympic site in Athens, Athens in the 1896 was chosen to host the revival of the OG; it was of a great success, regarding its low financial preparation back then. The site choice was limited to the place where the ruins were found for the revival of the Games on the mounts of the Olympia. Urban and Architecture restorations were implemented to the survived facilities to hold the first modern Games avoiding the construction of new facilities, leaving less impact on the urban pattern of the city and low economic cost for the preparations.

It wasn't before the appearance of the World fair that the Games took a new approach, not just in the choice location, but also in the urban structure of the OG form, it was the start of creating the early modern Olympic built environment and continues model of impacts on the urban and architectural development level from venues and Olympic context. The world fair events taken in parallel to the OG of St. Louis in 1904 influenced a lot in the need of constructing huge imaged buildings, as

the games was of no effect on the ground level of attention for people as much as it did for the world fair. As a result, Coubertin realized the importance of the built environment as an essential urban factor for the building of the event seeing that the Games is more than a pure sports event, it was much more a way to develop a new philosophy towards a new Olympic theme.

It is not since 1908 till the 1928, this shift shaped the Olympic city more likely as we know now with several grand sports venues and facilities that shaped the formation of Olympic city all were built on significant choice of influences for selected sites:

- Olympic Stadium:

Starting with the main "Olympic Stadium", in 1908 London Games, the Games produced the first magnificent gigantic construction in the Olympic history, it was known as the White City Stadium, and it helped in holding many different sports in venue. It was built on a remote brownfield area, taking into consideration a new path towards urban transformation and regeneration for site development plans.

- Media centres:

Paris 1924 and Amsterdam 1928 OG, the journalism and culture factor appeared as an important role in the publication of the OGs back then, journalists and publishers came from around the world just to capture the moment. This called out for the necessity of building media and broadcast centre. But what appears to be more irrelevant in the urban strategic plan preparations for the 1928 Amsterdam OGs the choice of building new venues on temporary lands for the event time only having it demolished after the Games causing rational economic loss.

The Olympic Village: Los Angeles 1932 Games; the term "Olympic Villages" were first introduced to the games as a new main urban element necessary built for the accommodation of the athletes participating in the Games adding new urban element to the Olympic urban context. It changed and affected a lot not only on the urban fabric of the Olympic City but in the city strategic development plans through introducing a new housing paradigm to the urban context that not only could gain benefits for the host city during the Games but also beyond.

In the 1936 Berlin OG, the Games added another new shift in the form and shape of the design of the Olympic City by introducing the games to the Olympic Quarter which was built on a distant historic site, strategically previously planned for the first time to act as a site that promotes development of sports and cultural area. The site was a gathering point for all the Olympic facilities needed during the host. The site consisted of new constructed stadium holding up to the capacity of 100,000 seats, as well as, a real built swimming centre for the first time of the OG, and an open-air amphitheatre all these buildings were surrounded and linked by a monumental vista called "The via Triumphalism" which was considered the main vista and landmark of the site back then. Many urban city elements have been introduced to the design from building landmarks leading to vistas, building new monumental sports venues as shaping new paths and open spaces in the Olympic quarter. The choice of the site was very firm and directly affected by the surrounding cultural influence from having an old historic open amphitheatre that was also used during the Games. Also for the first time, the thought of providing easy transportation for athletes from all over the world was added as good thought of preparation by choosing a site that already near a train station providing safe transportation from surrounding cities adding a spark for the importance of infrastructure and transportation value to the success of the event.

The Berlin case of setting considerations in strategic plans was adopted as a genial concept for a better deliver for early preparation for the Games. This was seen later on by several case studies, for instance, the Munich 1972 OG, the Games location was previously included among the strategic development plans of the city, having it centralized in the centre of the city promoting for better and healthy life for citizens.

Again, planning for such event must take a strategic approach [12]; therefore the Games changed its preparations plans and approach in the direction of engaging city development plans with hosting development plans. London 1948 OG was the first to adapt this approach clearly and wisely, having hosted a previous OG in the 1908th the site didn't need much further development instead they tried to use most of the existing facilities surrounding London. The site didn't need much development; no new development impacts were done in the built environment [22].

Furthermore, new urban dimensions were introduced to the Games, the Helsinki (1952) and the Melbourne (1956) OG expanded the Olympic context which is permanent till our days, it's the "Olympic theme park" an integrated landscape theme park holding different sports facilities designed to work on the rise of the touristic value of the city helping in the flourish of the economic level of the city. In the Rome 1960 case, the Games took a new challenge in how it is possible to deal with hosting a huge event without jeopardizing the urban historical context of the city leading with the conclusion of using 3 distant locations all set out of the city causing the demand of implementing deep infrastructure plans solving the transportation problems during the event.

No doubt, that the most successful OG, from an infrastructural perspective, have been those that have followed a clear plan whose implementation has not necessarily depended exclusively upon securing the event [3]. Proving out what said, the Tokyo OG in the 1964s was of a great success in engaging clear and wide infrastructure plans for the sack of organizing and preparing the Games as well as overcoming the loss of the demolishment of the city caused by the disastrous impact of the Hiroshima bomb in 1945. Instead, Japan took further steps towards urban development of the city to attract people once again to come to the city by adding ambitious urban renovation scheme, developing the water sewage of the city, providing appropriate accommodation areas for cities and visitors and finally by developing a well functioned transportation system for the city.

Despite its great and massive significance in the building structure industry, the 1976 OG have showed the world the importance of planning not only for the city image, but also for economic wise decisions for future assumptions. It was the first time for the Games to have the “white elephant” legacy shown in the Montreal OG, resulting in building huge massive structure planned only for the event period leaving it deserted after the Games without previous assumptions and plans for the use of these buildings in the future.

Setting influences took much more exquisite and delicate shapes implementing political decisions, by considering the Games as a peace promoter to the world the 1988 Seoul Games found the event as an opportunity for war timeout, trying to overcome its

losses and set peace example worldwide. From this moment, the Games took several different tracks by host cities, looking at the event as an opportunity to overcome any political, economic, socio-cultural or even environmental. This has been shown in the Barcelona 1992 OG where the Games has shown a new track for re-imaging and regenerating slum and industrial zone to make Barcelona a better place for local community to live and also adding the most benefited factor that can't be missed, the economic factor which was caused by the games adding a touristic value to the city for the post-time of the Game. Also, the Beijing 2008 Games showed an overcome in the economic sector of the city governance, promoting social friendly value with the world.

The urban criteria assisted in the plan change helped in developing the key principles for the site development to which any future development on the site should respond. These key principles mentioned in Fig. 4 covers only the urban design matter for the site and by looking closely to it we may find sustainable urban development responses developed on the ground level through time.

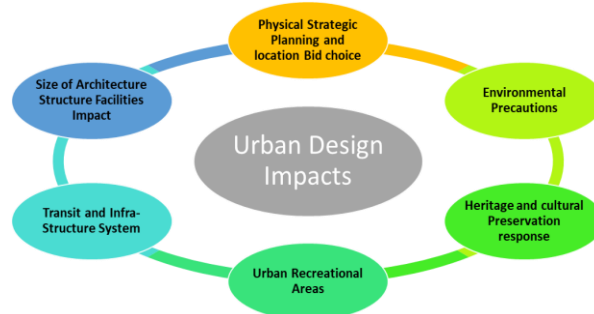


Fig. 4. Indicators for urban design impact on Host Locations. Source: Author.

4. ANALYSING URBAN LEGACY AND OLYPMIC SUSTAINABLE INTENTS

Taking a look at the previous timeline review analysis for both setting location selection influences and urban dimensions implemented for the preparations of the event, the Games gradually showed significance in engaging urban legacy for both the success of the host of the Games and for its strategic development interests for the future of the city. This legacy differed from urban legacy, social legacy, economic legacy, finally, sustainable environmental legacy. Figure 5 below highlights the first appearance of each legacy and why where they necessary for success of the games.

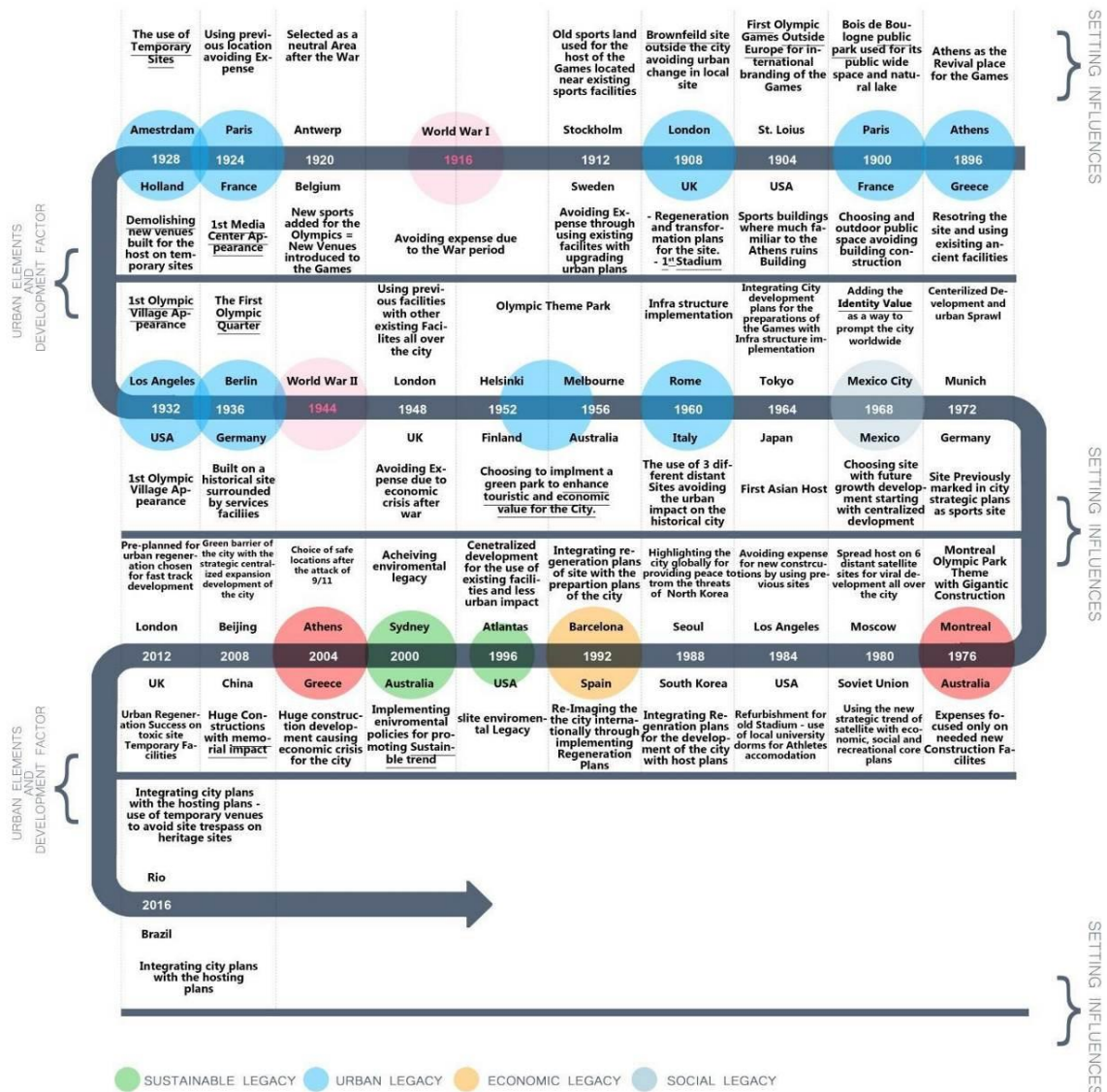


Fig. 5. Legacy Highlights in the Olympic Urban development history. Source: Author

The OG have emerged as a crucial tool of urban and regional renewal through their ability to justify redevelopment and enhancement, attract inward investment, promote tourism, and create new images for host cities [13]. Every time the games arrive, a new turn of urban development emerges due to the Games demands for the city's preparations for the Games.

The demands can somehow be categorized as direct or indirect (needs) that help in the urban transformation of urban spaces and affect mainly in the choice of the site location. According to the historical development stream of the OG as a sports' event, the Games has reached out to highlight 4 different legacies, each legacy helped in the

shaping and the development of the urban form of the Games through time and even much more. As it said, Mega-event generates numerous positive and negative impacts for the host city [14-17]. These positive economic, environmental, and social impacts are beneficial for urban sustainability [18-21].

4.1 Urban Legacy

Urban act shown in the formation of new urban patterns shaping the design of the Olympic City, as resembled in the first Olympic Stadium designed and built in the 1908 London OG, the Olympic Village of Los Angeles 1932, as well as, the launch of the first Olympic Quarter in the Olympic history which combined all sports and OG facilities and services needed for the Games in one place all in favor of the Games necessary preparation facilities but in the 1960,1968,1984,1988, 2012 Games took another further track. The scale of urban interventions has obviously increased, by looking at the amount of development that was clearly equal to the scale of development of a strategic plan adopted by the city to make change. These scale of interventions on the city were at the early stage was of small scale until 1960 the engagement of infrastructure development, or city restoration plans or even regeneration and refabricating plans where obviously engaged with city OG preparation plans [3]. Adding to this, also cases of demolition of buildings on temporary sites.

4.2 Social Legacy

Valuing the event for the community and the improvement of the image of the country as host. Several cases proved the success of hosting the games in favour of promoting social and city identity through hosting the Games, this act was firstly shown in the Mexico case promoting a small city to the world through showing its identity in a worldwide sports event. Consequently, this act gone viral in the 2008 Beijing Games, 2016 Rio Olympics as well.

4.3 Economic Legacy

Influenced much further cases such as the 1984 Los Angeles Games, conducting refurbishment strategic plans for an existing site, likewise the Stockholm

1912 and London Games 1948 where both cases showed the importance of saving expenses to avoid further impact structure on urban context, avoiding emissive unnecessary expense for the Games. Moreover, the economic factor developed more thinking of the future of the city adapting the Games to give and impressive image worldwide, leading to the flourishing of the economic market of the city as seen in both cases Barcelona 1992 and Beijing 2008, also London 2012 OG which was of a great management success.

4.4 Environmental Sustainable Legacy

The Rational of sustainable development in the urban context can be seen in the optimization act taken to minimize the architectural and urban forms of impact of the built environment and its effect on the natural environment [9 and 22]. This act was first initiated and deliberated by the IOC through several actions and development sustainable guidelines and roles for the preparation and the monitoring process of the games. These roles were made to assure the sustainable deliverance of the games, in order to do so cities started to adopt several environmental sustainable act for the preparation of the Games. First Appeared in Sydney 2000 Green Games, 2012 London Environmental solution, and last but not least the Rio 2016 minimizing the intervention of built environment on heritage marked sites and not affecting the surrounding environment.

These 4 acts have shaped the periodical timeline of the development of the OG developed from the idea of implementing refurbishment and developing existing facilities, to engaging city's' strategic plans with the preparation plans of the Games, until the legacy formulation of the Games, the new changing attitude circulated by the IOC trying to change sports events to an urban sustainable development leading process as a benefit for the development of quality of life for host cities, compromising different Olympic urban terms of interests in order to provide environmental, social, economic and governmental sustainable solutions. Figure 6 shows the urban impact and its relation to urban development acts on the host cities.

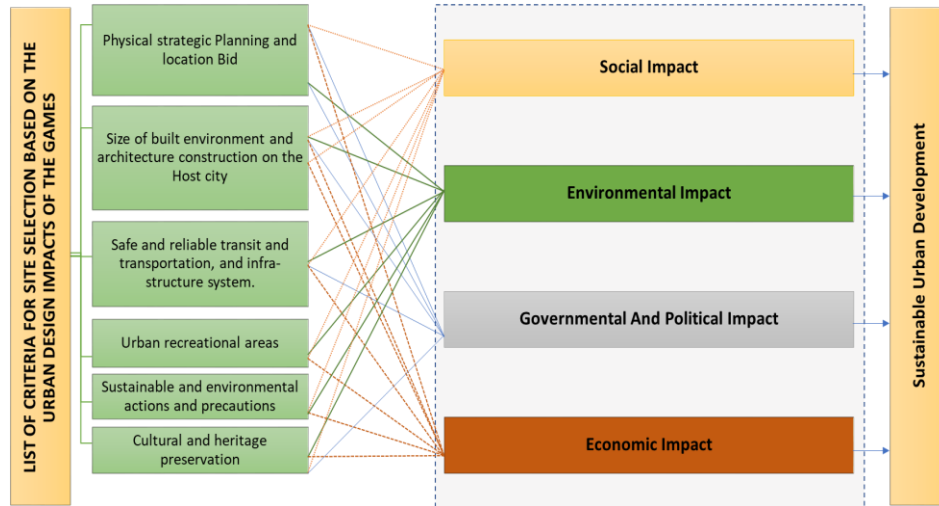


Fig. 6. Urban Impacts indicators and its relation to Sustainable Urban Development Act. Source: Author.

5. COMPARATIVE CASE STUDIES

This section defines the urban impacts of the Summer Olympic Games in a comparative analysis for selected consecutive case studies as shown in (Table 1). Each case study was chosen according to their resemblance in the following criteria:

- The decision was made to consider cases that are recognized for its successful legacy given to the host City as they are more likely to produce positive results in terms of the sustainable structural transformation.
- It is also chosen for its huge urban interventions, urban transformation and urban renewal strategies and plans taken to transform the city into a successful hosting one.
- The choice of case studies is meant to be shown in various urban cultural settings from all agreed on one situation which is hosting the summer Olympic Games but in different cultural, social, and environmental conditions.
- The three showcases represent different continents Asia, Europe and South America with different economic level.

On this base and as the capacity of this study is limited all the information included is based on the city's' bidding reports submitted for the preparation of the Games to the OM, also the post-event evaluation results reports assigned by the city. The selected cities for the study are as follow; Beijing 2008, London 2012 and Rio

2016 Olympic Summer Games. The sustainable evaluation performance mentioned in Table 1 measures the urban transformation impact on Host City Location showing how progressive the impact was for the future development of the city. This evaluation performance is divided into three categories:

1. Very Good Impact: Showing the progress of the transformation development of the city towards delivering the sustainable Olympic Games adding a sustainable legacy to the Host City.
2. Bad Impact: Shows how negative was the effect on any of the sustainable pillars of development of the city.
3. Good Impact: Indicates a mild impact of the kind of urban intervention on the sustainable development of the city.

Table 1. Comparative analysis of urban impacts on Selected Host Cities.

Urban Impact Indicators	Beijing 2008				London 2012				Rio 2016			
Physical Strategic planning and location Bid	-The use of green belt zone used as an expansion of the existing strategic plan of the city for future sports development. - Benefits from existing Sports facilities built for the Asian 2000 Games. - Major economic investments, new environmental management systems were introduced to the development, strategic system plan of the city, social development actions taken in progress, and improving Governmental systems.				Accelerating strategic regeneration plans for inspiring legacy through: - Engaging Olympic development plans with the city strategic plans conducted urban renewal plans on an old Brownfield sport located in the North-East land of London. - Implementing and conducting new "Green" revolution plans and policies to achieve legacy.				Developing 2 new consecutive integrative strategic development plans for the city's preparations for the Games: First: For the preparation for the bid. Second: to fasten the development plans for cities preparations for the Games. - Implementing urban transformation plans on 4 selected host sites with previous sports hosts' experience. There only issue was the delivery wasn't on time as planned.			
Sus. Impact	Soc.	Env.	Gov.	Eco.	Soc.	Env.	Gov.	Eco.	Soc.	Env.	Gov.	Eco.
Urban Impact Indicators	Beijing 2008				London 2012				Rio 2016			
Size of Architecture Structure Facilities Impact	-Extensive investments were implemented on huge building construction to meet the city's main goal of leaving a positive memorable impact on visitors. -Location venues were near existing neighborhoods in				-Implementing green solutions through using existing site soil for construction. -Reuse plans for constructed facilities for post local community use after the event. -Recycling demolished				-Introducing "nomadic architecture" concept theme concerned with: Use of recycled materials from demolished site. -Ventilation solution management conducted in open air venues. -The structure could be			

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Urban Impact Indicators	Beijing 2008				London 2012				Rio 2016			
	post community uses. -Implementing environmental Solution for accommodation units and having a post-economic plan for selling apartments for.				temporary facilities. -Use recycled materials. -Implement waste and energy consumption management in building an operating system. -Ensured the implementation of environmental solutions for Sustainable homes achieving level 4				broken down and divided to another small community needed facilities such as schools for local community children. -Implementing LEED environmental solution for accommodation buildings and planning for post housing apartment solution.			
Sus. Impact	Soc.	Env.	Gov.	Eco.	Soc.	Env.	Gov.	Eco.	Soc.	Env.	Gov.	Eco.
Urban Recreational Areas	Social and Environmental plans were adopted by: -Minimizing resource consumption helping in the awareness of the ecological nature on the city. -Merging traditional landscape concepts that emphasize the need for the artificial to appear natural and harmoniously picturesque, with contemporary technologies. Despite all this the parkland currently receives no permanent care because of the post-management plans for the park				The park included many Entertainment, educational and cultural activities during and after the Games time. Several Environmental plans conducted: - To Restore the Waterways to Manage the Flood Risk on the local community. - Biodiversity and ecological connectivity actions were enhanced. - Implementing soil remediation plans to the site. - Reducing carbon emission through on-site renewable. - Using Recycle Construction Materials through the Parkland				- Benefit from the Natural environment. - Introducing sports landscape as a part of a recreational park lands			
Sus. Impact	Soc.	Env.	Gov.	Eco.	Soc.	Env.	Gov.	Eco.	Soc.	Env.	Gov.	Eco.
Transit and Infrastructure System	-Expansion of infrastructure and transportation facilities to cope with the no. of visitors to the city during and after the Games. - Encouraging the use of low carbon emission vehicles. - Providing Olympic transportation efficient network lanes during the				-Benefiting from the waterway as mean of transportation during the host. - Introducing 100 cycling and walking route lines accessible, encouraging and easy for people to use to lower carbon emission plans. The construction of new bridges and highways to				- Expansion plans were implemented to the international airport for post tourists and events visits. - Built all kinds of BRT and LRT systems to encourage people use public transportation. - Widening bike lane plans all over the city to promote better and healthy quality			

Urban Impact Indicators	Beijing 2008				London 2012				Rio 2016			
	Olympic travel tour to minimize traffic for athletes.				the site to increase connectivity.				of life. - Developing the international Port of Rio de Janeiro for post economic investments and benefits.			
Sus. Impact	Soc.	Env.	Gov.	Eco.	Soc.	Env.	Gov.	Eco.	Soc.	Env.	Gov.	Eco.
Heritage and cultural Preservation response	-The Government's aim was to regenerate the surrounding districts and preserving historical districts for touristic and economic benefits through Creating a new bridge between the major stakeholders and the government parties (PPP) to achieve conservation and rehabilitation of Hutong areas - Improvement in living conditions. - Preserving historic buildings and courtyards for the protection of cultural heritage				- Encouraging users experience the beauty of the new renewed district east side of London.				Preservation and transformation development plans were conducted to several spots surrounding the 4 host regions shown in: - Upgrading surrounding neighborhoods and implementing new accommodation villages and implementing cruise ships for accommodation plans for both Olympic and post-Olympic Plans. - Turning the district into a world international shopping, cultural and entertainment center			
Sus. Impact	Soc.	Env.	Gov.	Eco.	Soc.	Env.	Gov.	Eco.	Soc.	Env.	Gov.	Eco.
Environmental Precautions	- Air Quality improvements. - Waste management. - Sewage management. - Energy consumption and generating systems.				- Climate Change. - Waste Management - Biodiversity. - Healthy living				- Transport and Logistics. - Waste Management. -Environmental considerations in clean up.			
Sus. Impact	Soc.	Env.	Gov.	Eco.	Soc.	Env.	Gov.	Eco.	Soc.	Env.	Gov.	Eco.
Key Evaluation Performance												
Sustainable impact	Soc.: Social			Env.: Environmental			Gov.: Governmental			Eco.: Economic		
Indicator Chart	V.G	Good	Bad	V.G	Good	Bad	V.G	Good	Bad	V.G	Good	Bad

Note: All data is based on the (IOC, factsheets and Host City official reports)

6. HOST LOCATION ASSESSMENT AND EARLY DESIGN CONSIDERATIONS

During the process of developing indicators from the theoretical methodological analysis for the periodical timeline review, a list of site selection indicators were highlighted to assist the sustainable act of location choice for host cities, which will act as an assessment tool that covers the sustainability of the urban act of development

implemented on the hosted locations. This part of the research will define the assessment tool, based on 3 successful case studies Beijing 2008, London 2012, and Rio 2016 OGs. Also it will show the relevant principles added for how the assessment tool could work and achieve in terms of sustainable development for host location.

6.1 Sustainable Olympic Urban Assessment (SOUA)

The SOUA is considered a developed assessment tool developed to assist in the location selection process for host cities. The following six tools are developed based on the urban development impacts from the host of the Games on the host location.

6.1.1 Assessment 1: physical strategic planning and location bid

The main aspects of the assessment method are to engage early decisions on land use and strategic development in cities development plans to avoid sudden interventions that could cause destructive and burden strategic failure. In Beijing case the Games were already considered in its futuristic strategic plans development of the city, unlike London which showed different track of development the Case of host location was already considered a dumped area which needed urban regeneration plans the Government seen it an opportunity to fasten development plans for the selected location. In contrast to Rio case developed 2 new consecutive development plans one for the preparation of the Games, two was for accelerating the development plans of the city with the timeline of the preparation of the Games saving time. Dealing with consequences that it can't build anymore constructions around the city the Rio Case have chosen previously 4 sports locations that previously hosted several worldwide sports event.

6.1.1.1 Relevant principles and design considerations

- To ensure the success of the bid it is recommended to integrate all strategic development plans, which is directly affected by the host of the Games with the Games' preparation plans.
- Flexibility is recommended in planning and implementing objectives can evolve and be affected by external events and decisions.

- Cities reconsider using existing sports areas to avoid construction on natural environment and minimize cost.
- Seizing areas with urban regeneration plans as a significant host location fastening strategic development plans for the city.

6.1.2 Assessment 2: size of architecture structure facilities impact

OG is all about gigantic built environment that catches the eye of spectators from all over the world. These facilities differ from the main Olympic stadium, or several other sports facilities and training centres, also the Olympic Village, the media Centers and even includes accommodation or transportation stations seat for the Games. According to Beijing Case it seized the opportunity to build huge memorable structures, ignoring the economic factor of excessive expense for the sake of future economic rise and development the games will add to the city later. But unlike the excessive expense London and Rio Games used existing and temporary facilities for the Games to avoid unnecessary structure.

6.1.2.1 Relevant principles and design considerations

- Building Constructions with environmental considerations.
- Ensure the implementation of environmental treatments in the upgrading process of existing facilities to meet the IOC and cities sustainable policy's requirements.
- Restoration and refurbishment methods for existing.
- Including post usage plans for existing and permanent ones for the benefit of the local society and government as well.

6.1.3 Assessment 3: transit and infrastructure system

Transit and infrastructure systems have to be installed near the host location providing easy accessible system for local community and visitors, with environmental standards. In Beijing case, new airports, BRT lines and new roads were constructed to cope with the no. of visitors to avoid traffic jam during the event, but what was significant the plan made to decrease carbon emission before the Games providing better air quality

for citizens and visitors. London case developed a new transit station with high environmental considerations. Rio case was in a bad situation regarding its delivery time.

6.1.3.1 Relevant principles and design considerations

- Providing sustainable environmental, transit systems for public use during and after the Games host which is located and set near all host facilities.
- Implementing green transit systems in the city's infrastructure plan to decrease carbon emission for air quality improvements.
- Implying investment in the upgrading plans from surrounding infrastructure such as roads, water, sewage, and electricity, services transportations system to meet environmental and sustainable international standards.
- Turning all public transportation to gas fuel emission raising the awareness for better air quality consumption for environmental legacy.
- Promoting the use of the bike through conducting bike lane network connecting the entire cities route network.
- Engaging public sector investments with cities developing transit and infrastructure plans mainly for the surrounding hosting zones to ensure annual maintenance and care.
- Expansion and renewal plans for existing bus, boat, airport and train stations to meet the capacity of visitors flow in and out the city during and after the Games.

6.1.4 Assessment 4: urban recreational areas

Parklands provide the main entertainment function for visitors and local community it provides recreational area, huge open spaces with greenery, waterways and wetlands. It also includes the main venues of the Olympic. Beijing was fascinated by the cultural influence on the natural parklands, while London was more inspiring with its environmental management and restoration plans for the contaminated brownfield. Rio had a different aspect, due to 65% of the city is marked as a world heritage sport with huge natural green environment. So, adding a recreational park was much different in use then other host cities.

6.1.4.1 Relevant principles and design considerations

- Protecting nature through ensuring Biodiversity and ecological connectivity actions.
- Using Recycle Construction Materials through the parkland.
- Use developed waste management plans through recycling all waste from user's visits.
- Providing open recreational areas for local community use in and out their neighbourhood districts to ensure better quality of life.

6.1.5 Assessment 5: heritage and cultural preservation response

City would benefit from the preparations for community needs by engaging their efforts in preparations for economic benefits to the local community as well as how the government intervenes to engage the hosting project development with the development of local community districts surrounded the Olympic region. Also through promoting cultural heritage worldwide for host cities by including heritage marked location as a priority for host location choice for the city.

6.1.5.1 Relevant principles and design considerations

- Implementing, developing plans from regeneration and transformation plans for historic and local districts.
- Improving living conditions for the surrounding local community.
- Preserving historical and world heritage and natural sites.
- Create a new bridge between the major stakeholders and the government parties (PPP) to achieve conservation and rehabilitation for local community surrounded neighbourhoods.

6.1.6 Assessment 6: environmental precautions

Following the development of Agenda 2020 which includes the necessity of having environmental precautions through the whole process of the preparation for the event, the OM have shown the importance to focus on how to preserve local resources and sources by maintaining sustainable management. Also by taking care climate changes, and providing better air quality for citizens and athletes.

6.1.6.1 Relevant principles and design considerations

- Developing environmental themes and objectives applicable with the host city constructions and development phases of the games in terms of infrastructure plans, urban renewal plans, and urban transformation plans, environmental, social and economic development plans as well.

7. SUMMARUY AND OUTLOOK

All these changes are so profound as to constitute a paradigm shift, a new collective mind-set, a revitalized vision of what is appropriate and possible in OGs sustainable planning. The developed research assessment (SOUA) tries to provide a way to enhance the benefits gained for hosting the Games on any selected location by proving the success of the Games in implementing fast track sustainable development for successful host locations; which all can be achieved through; applying flexible strategic plans for cities to cope with the sudden changes implemented caused by any kind of gigantic events. Also, minimizing and avoiding any construction plans for building unnecessary facilities, having in mind its cost, futuristic use and its environmental impact on site.

Likewise, the study proves that locations have to be selected according to the minimum trip taken by athletes or visitors to the host city in order to avoid huge transformed and developing plans in the infrastructure of the host city. Thus, infrastructure plans with long-term benefits can be useful for local community services which are recommended to be included within the preparation plans for the Games on site. In addition to how the urban recreational areas can add to the location a healthy and better quality of life factor, enhancing and encouraging the local community to participate and engage in physical activities.

Furthermore, we can't deny how the OM tried to change the way of the preparation of the Games by adopting environmental themes as a main strategic pillar the developing guidelines and the OM Agenda 21, all to minimize the use of natural resources and saving more energy from consuming it during and after the Games, in

favor of, giving the host city the benefits of being a catalyst for environmental development in host cities.

Needless to say, the developed assessment in the research should be pursued in parallel with the continuous development in the Olympic Games and the studies on Olympic Host cities, to assure the approach towards delivering sustainable design assessment for Host Location.

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تصميم تقييم إستدامة مواقع الإستضافة للألعاب الأولمبية

تستقطب الألعاب الأولمبية كل أربع سنوات انتباهنا إلى حدث يبهر الملايين حول العالم ويناقش البحث أنه عند اتخاذ إحدى المدن قرار الإستضافة للحدث، فإن كل مخاوفها تدور حول مدى التحول الحضري المؤثر على المدينة سواء كان بالإيجاب أو بالسلب ونتيجة لذلك، فإن مجموعة من العوامل إن لم يتم مراعاتها ضمن خطط الإعداد مراعاةً للتنمية الاستراتيجية للمدن المضيفة، قد تشكل عبئاً على المدينة. لذا، فإن اختيار الموقع يعتبر من أهم القرارات التي يجب إتخاذها بتأني لضمان إستضافة المدينة المضيفة للحدث بالتالي، يقدم البحث عدد من الدراسات المتعلقة بالمدن التي سبق إستضافتها للحدث، وأثبتت نجاحها في اختيار الموقع في إطار تقديم التصميم الحضري المستدام والتخطيط الاستراتيجي للمدينة المضيفة ويتناول الإشارة إلى عناصر التصميم الحضري الرئيسية المتأثرة بعملية التحضير. وصولاً إلى تقييم التصميم الحضري المستدام مع تسليط الضوء على العوامل الحضرية المأثرة من إستضافة دورة الألعاب الأولمبية، وأيضاً العوامل الرئيسية المستدامة التي يمكن أن تتأثر بالتغيرات الحضرية على الموقع.