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Master Thesis

The role of mega-events in promoting territorial sustainability: the case of the sustainability plan of the Tokyo 2020 Olympic Games

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Abstract

Although cities are correctly considered as a complex phenomenon, they mainly constitute the main growth factor in the global economy as well as the main responsible to produce environmental pollution and social inequalities. To support this thesis, numerous researches argue that cities tend to compete to attract investments that are useful for growth and, in this way, try to strengthen their 'global identity'. For this reason, cities tend to host the so-called mega-events which undoubtedly bring enormous investments, evident urban transformations and various benefits. On the other hand, cities are very fragile, victims of climate change, natural risks and indiscriminate land consumption. So, they are the problem, they suffer the consequences directly and must seek the most sophisticated solutions to make certain impacts sustainable.

In fact, the concept of the mega 'global' event and sustainable development are now widely discussed and widespread paradigms, which can very often be poles apart. In reference to the context, Japan tries to obtain both, because it is attentive in the development of environmental and sustainable policies, especially at the metropolitan level, and at the same time it tries to strengthen the figure of a global city by hosting the Olympic Games. Interestingly, the two macro-topics have historically been little discussed as interconnected issues. As a logical consequence, the main research question was asked: can the location of the Olympic Games in given urban context favour the development and implementation of sustainable urban and territorial policies?

To answer this question, the research conducted focuses on analysing the evolution of major events with the trend of recent years, with the latter seeking to embrace sustainable policies and projects; this trend is repeated in the Japanese context, and in particular, through the lines defined by the International Olympic Committee (IOC) and the Greater Tokyo metropolitan area. The methodology used is based on the review of the international academic literature on major events, on the study of the various documents relating to the issues analysed, on the interviews conducted and on the online meetings. In conclusion, the aim of the research is to understand the evolving processes and the role that global cities like Tokyo play in developing sustainable urban policies, despite this identity cannot help hosting world-class events that apparently only have sustainable political slogans to improve the reputation of the city concerned.

Nonostante le città sono correttamente considerate come un fenomeno complesso, esse costituiscono il principale fattore di crescita nell'economia globale nonché il principale responsabile nella produzione dell'inquinamento ambientale e diseguaglianze sociali. Per sostenere tale tesi, numerose ricerche sostengono che le città tendono a competere tra di loro per attrarre investimenti utili alla crescita e, in questo modo, cercano di rafforzare la propria 'identità globale'. Per tale motivo, le città tendono ad ospitare i cosiddetti grandi eventi che portano indubbiamente enormi investimenti, trasformazioni urbanistiche evidenti e svariati benefici. Da contraltare, le città risultano molto fragili, vittime dei cambiamenti climatici, dei rischi naturali e del consumo del suolo indiscriminato. Quindi esse sono il problema, esse soffrono direttamente le conseguenze e devono ricercare le soluzioni più sofisticate per rendere sostenibili determinati impatti.

Infatti, il concetto di mega evento globale e di sviluppo sostenibile sono ormai paradigmi molto discussi e diffusi, che possono essere molto spesso agli antipodi. In riferimento al contesto, il Giappone cerca di ottenerli entrambi, perché attento nello sviluppo delle politiche ambientali e sostenibili, soprattutto a livello metropolitano, e contemporaneamente cerca di rafforzare la figura di città globale ospitando i Giochi Olimpici. È interessante notare come i due macro-argomenti storicamente sono stati discussi poco come questioni interconnesse. Come conseguenza logica è stata posta la principale domanda di ricerca: la localizzazione dei Giochi Olimpici in un determinato contesto urbano può favorire lo sviluppo e l'implementazione di politiche urbane e territoriali sostenibili?

Per rispondere a questa domanda, la ricerca condotta si concentra sull'analisi dell'evoluzione dei grandi eventi con la tendenza degli ultimi anni, con quest'ultimi che cercano di abbracciare politiche e progetti sostenibili; questo trend si ripete nel contesto giapponese, ed in particolare, tramite le linee definite dal Comitato Internazionale Olimpico (CIO) e dall' area metropolitana della Grande Tokyo. La metodologia utilizzata si basa sulla revisione della letteratura accademica internazionale sui grandi eventi, sullo studio dei vari documenti relativi alle questioni analizzate, sulle interviste condotte e meeting online. In conclusione, la finalità della ricerca è comprendere i processi in evoluzione e il ruolo che le città globali come Tokyo ricoprono per sviluppare politiche urbane sostenibili, nonostante tale identità non può fare a meno di ospitare eventi di portata mondiale che apparentemente di sostenibile hanno solo gli slogan politici atti a migliorare la reputazione della città interessata.

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Foreword

Before going into the specifics of the topic, it is worth pointing out one aspect that has characterised the work carried out and the journey undertaken. The idea of the thesis was conceived as a process strongly marked and linked to the action of research in the field, therefore including interviews, lectures, workshops, seminars, and on-site inspections. This mission, it is undeniable, is one of the most fascinating and motivating aspects as well as challenging.

The objective was to understand and analyse in-depth the tool of the sustainable plan made specifically for the Tokyo 2020 Olympics: this implied having to leave and go to Tokyo to maximise the results that research from home can only touch upon. It is useless to report here the initial discouragement following the cancellation of the activities mentioned, even if for a very just and extraordinary cause dictated by a global pandemic. More significant instead is the support that the author has received to think again about the structure and give it a dignified look despite this considerable handicap. This has meant the end of an approach oriented only at the sustainable plan of Tokyo to arrive at a more comprehensive comparative analysis of the same instrument in the last editions of the Olympic Games. Despite the remoteness, and thanks to the IT tools that we use daily, it has been possible to meet people who initially had to meet through a face to face interaction and this has curbed the initial drawback of the research bringing valuable information to enrich the structure of the work. This last anecdote can make you understand the slow transformation of the initial feeling of being alone in a great opportunity to grow professionally thanks to a series of people and tools that have limited the damage and that have allowed the author to finish a master course satisfyingly.

1. INTRODUCTION

The proposed Master Thesis is the result of extensive research conducted with the Department of Urban Engineering of The University of Tokyo. The research was carried out within the International Development & Regional Planning Unit through the significant support of Prof. Fumihiko Seta and his research team. The activity of research was characterized by a rich amount of activities personally conducted such as interviews and online meetings. Unfortunately, due to the spread of COVID-19, it was not possible to prepare the research abroad and consequently all the visit to case studies, which are decisive to get to know to the issues, lectures, meetings, and workshops were deleted. Progress documents that were postponed and most of the different perspectives that research abroad can offer, and which may enrich the research are not present in this thesis. Thus, previous the sanitary emergency the work was based and oriented to go in deep in the case of Tokyo and according to the impossibility to reach the city interested and pursue studies field the structure was changed to a comparative analysis between plans.

Chiefly, the activities introduced shortly traced the framework of the Master's thesis, which concerns the study of the impacts of mega-events that only recently tend towards sustainable development, obviously influenced by the Rio Earth Summit where the Agenda 21 was adopted in 1992. Therefore, an analysis of Tokyo's territorial governance and the perspective of the IOC sustainable plan is undertaken. From this point of view, Japan offers an interesting context in which to perform the analysis. Indeed, concerning environmental and sustainable policies and projects, the Tokyo Metropolitan Government has always been characterized by innovation and has introduced various measures relating to these issues.

Furthermore, it is useful to analyse if and in which way the IOC's sustainable plan is influenced or influences some plans of the different local government actors involved; at the same time, it is equally crucial to understand if the sustainable plan is affected by some urban policies previous to the creation of the aforementioned plan.

Hence, the main research question was established:

- Can the localization of the Olympic Games in Tokyo favour the development and implementation of sustainable urban and territorial policies?

Besides, sub-questions emerged:

- What are mega-events?

- What are the impacts of mega-events?
- How does mega-event interact with the surrounding environment?
- What are the perspectives of the IOC in sustainable development?
- What type of physical problems should tackle the IOC's sustainability plans?
- Which were the vision for Tokyo 2020 in the urban planning field?
- What innovation in sustainability brought the IOC's plan for Tokyo 2020?

Therefore, the objectives of the research listed as follow:

To understand the concept of mega-events;
To appreciate the impact of mega-events on sustainable development;
To define the characteristics of the sustainability plans made by IOC through a comparative approach of recent editions of the Olympic Games such as London and Rio de Janeiro;
To evaluate the territorial governance context in Tokyo-region and Japan;
To review the urban planning practices and visions implemented by the Japanese government on the occasion of the bid for Tokyo 2020 Olympic Games;
To define the character of the IOC's sustainability plan for Tokyo 2020.

The controversial relationship between mega-events and sustainable development is nowadays vastly discussed in the international literature, but not largely debated are the consequence upon territorial governance and this is the reason for why the topic was selected. Accordingly, this work aims to analyse the dynamics of mega-events and the evolution of the sustainable concept within it and its role in the promotion of territorial sustainability. To respect the above purpose, a comparative analysis of various case studies related to IOC sustainability plans between different recent editions of the summer Olympic Games was made through international literature and analysis of IOC official documents. Consequently, a methodological phase will concern the analysis of the Japanese context that will host the 2020 Olympic Games in terms of territorial governance through domestic plans and guidelines. Finally, taking as a point the case of the IOC sustainable plan for Tokyo 2020, it describes the potential spill-over effects that it will obtain on the territory as well as, above all, the relationships that this plan has had and will have with the actors of the government of the territory.
The grounds cited, which define the research, were useful to divide into three main parts of the thesis. The first part can be considered as a theoretical framework composed by the first

chapter in which the discussion focuses on the issues of mega-events and sustainability with the latter from an IOC perspective. Instead, the second part is related to the analysis of mega-events sustainable paradigm and the relative case studies in London and Rio, which is discussed in the second chapter where the analysis of IOC's sustainability plans is carried out and a consequent comparative analysis performed. The third part finally is related to Tokyo especially in territorial governance analysis, urban visions for Tokyo 2020 Olympic Games and the consequent sustainable plan divided into three chapters. Overall, the conclusions discuss how the mega-events and sustainable development concept should be considered, remark the results obtained in the comparative analysis between sustainability plans, focusing on the Tokyo sustainability plan, making reflections on clear and hidden aspects of sustainable policies enabled through mega-events, and discussing future developments and the limits of the approach adopted.

In particular, the first chapter is developed through the review of the academic literature and the analysis of various documents related to the mega-event phenomena and the characters of the latest sustainable events defined by the IOC. This allowed discussing the mega event sustainable concept and how IOC vision sets SDGs as main objectives and can influence also the different territorial agendas of the hosting city. The second chapter is based on the analysis of international literature about the "greening" of the Olympic Games as mega sustainable event paradigm evolution through the years and the last Olympic Games editions with lead ahead innovative sustainable plans. Subsequently, is provided focus on the latest cases of sustainability plans in London and Rio. From this analysis, the third chapter aims to present the territorial governance context in Japan which will host the last edition of the Olympic Games. As a link, the Games brought innovation in different fields, also in urban planning and for that reason the fourth chapter illustrates the main visions which were presented four years before the Games also through the interviews conducted. Finally, the last chapter examined different aspects and dynamics of the Tokyo sustainable plan using the corresponding variables adopted for the case of London and Rio. Overall, the outcomes expected are related to a better understanding the mega-event as urban phenomenon especially in the sustainability paradigm whit practices and prospects from global and local actors. Besides, hidden aspects of environmental practices, comparative analysis of the plans presented, and critical considerations are undertaken in the concluding remarks.

2. MEGA-EVENTS AND THE SUSTAINABLE DEVELOPMENT OF THE TERRITORIES

Mega-events and sustainable development are usually seen as two different concepts, if not nearly incompatible. Accordingly, the following questions arise in the context of this research: how does mega-event interact with the surrounding environment? Can the impact and development generated be sustainable and therefore can sustainable policies be promoted? This section aims to clarify concepts useful at understand the phenomena of mega-event and more specifically the Olympic Games; then a perspective from IOC about sustainability development shall be delineated. The chapter focuses to solve the first question because for solve the second issue may is enough to finish the entire research work. Hence, the main academic questions are what mega-events are and why do they occur within a constant time lapse. Furthermore, analysis over the process of territorialisation of mega-event in a specific environment should be necessary. Finally, an insight from the IOC's official documents about the strategy of sustainable development and above all the definition of the actions towards the creation of a 'sustainable' Olympic Games. As Basso (2017, p.11) points out, the multiple infrastructures, sports and leisure facilities, residences, services, economic activities, jobs and tourism are the central "ingredients" of the political speeches in support of the candidatures. Consequently, mega-events such as the Olympic Games are historically international events (which recall a large circulation of athletes and visitors), and there is no doubt that they constitute today 'global' events (Roche, 2008). In support of this latest statement, think of the last few years with the mega-events that have taken on a central role in the governmental agendas of many cities that aspire to hold increasingly important positions in the geopolitical and economic scenario (for instance the BRICS[1]). As a result, the combination of different elements, including those above highlighted, enables host cities to abide by the "package" of interventions that international organising committees such as the IOC require (Braathen et al., 2014). Hence, another question arises: will they also comply with recent guidelines ratified by an international organization such as the United Nations on sustainable development? For solving this matter, it is useful to start with what the Olympic Committee itself foresees in terms of strategies aimed at the sustainability of the Olympic Games. Furthermore, every candidate

[1] The relative economic decline of the United States, Europe and Japan is often linked to the rise of an 'emerging' bloc comprising Brazil, Russia, India, China and South Africa (BRICS).

city must meet the requirements and among these recent there are some inherent to the issue of sustainability, divided into diverse areas of interventions.

2.1. Definition of mega-event and why it occurs frequently

The expanse and importance of the concept of mega-event and the numerous effects that it brings with it allow us to draw from the academic literature various definitions of the phenomenon. Nevertheless, it is important to specify that there are so many fields concerned that it is essential to retrace a short history of the research sectors that have become interested in the concept and then try to define it in a unique and useful way for the cause. The mega-event concept is not a recent phenomenon, but the topic has seen a considerable increase in these last decades in terms of new research, scholars, professionals and attention by policy-makers. Historically the first sector, as well as the original area of study which dealt with the analysis of the phenomena, was the economies and the tourism sociology; according to this branch, mega-events represent the "image builders" of modern tourism, because capable to influence tourism marketing strategies at the international, national and regional scale (Hall, 1989). Moreover, continuing in this field, Burns & Mules (1986) introduce the naming *special event*, taking in consideration the size of public investments moved towards to support the bid for the candidate and for the management of the event. From the latter definition, seems clear the extraordinary effect over government and host city or region, out from the normal routine. Hall claims that the definition of mega-events as a synonym of special events and hallmark events; the primary function of these kinds of events are offered at cities the opportunity to make sure a relevant position in the market of touristic destinations, for a specific and well defined time duration.
In the economic and social literature of recent years, it is registered growing attention towards those who some scholars from time to time they call "mega-events", or "big events", precisely about events whose organization has considerable effects not only on a territorial level but also social, cultural, political (Essex & Chalkley, 1998; Hiller, 2000). To use Hiller's definition (2000), these are "short-lived and high-end interventions profile"; in fact, we are faced with events of generally limited duration, rather diversified by the type of offer and services provided, with massive involvement of quotas consisting of users, partly local, partly from very large and diverse basins. Still, various scholars use concepts like mega-events, big events, "quality" events, hallmark events or special events as almost indifferent terms:

the authors cited they recall the Olympics, or other sporting events of excellence, or even the exhibitions and events international fairs (such as expo, international exhibitions, fairs) without having to resort to a more precise conceptual and classificatory apparatus, which avoids overlaps and is instead can clearly distinguish events. Among other things, the same reference to the Olympics leaves out the fact that there is a difference significant between the so-called summer and winter ones (with substantial differences regarding sites and space organization, environmental impact, public transport problems, budgets, number of athletes involved and participating nations).

In the collective consciousness, mega-events are identified since the late 19th century in two main mega-event typologies: Expos and great international sports events. Historically, the latter has been the Olympic Games, but in the post-war period, this was joined by the FIFA football World Cup. The Olympic Games, especially over the last 20 years, has experienced unprecedented development and widespread reputation. It is the largest and most successful sporting event in the world and has become the apogee of most athletes' careers. Hosting the Olympic Games is a major project which always leaves a durable mark on the host city and region as well as their residents. Therefore, new or renovated venues and infrastructure are built, and this testifies that Games may represent a restoration strategy for the host city. Generally, mega-events are short term and complex phenomena that leaving a significant legacy (pre-event and post-event) on the host nation and more specifically in the city which conclude positively the bid (Roche, 2008). Consequences are understandable in terms of territorial evidence, even so, are not the only effect: these kinds of events influence particularly social, cultural, political and economic dimensions which are not infrequently linked. Thus, mega-events appear to have established an abiding presence, popularity and memorability in modern society and have been held regularly every four or five years in a specific nation, region or city. More deeply, the role of sporting mega-events aim to trigger reconfiguration of the urban landscape, and the phenomena create huge impacts on social groups directly affected by large projects of urban regeneration built with the purpose on the one hand to accommodate the event and on the other to strengthen the 'global' image of the city interested. Summing up, the mega-events are only the Universal Expositions, the Olympics and the World Cup because they have a global reputation and target/market, generate substantial interest from the global media and require an organizational process supported by national and international actors (Roche, 2000).

Event type	Example	Target / market	Media interest
Mega Event	Expos, Olympics, World Cup (soccer)	Global	global TV
Special Event	Grand Prix (F1), World Regional Sport	World Regional or National	International or National TV
Hallmark Event	National sport event, Big City Sport\Festival	National/Regional	National TV/ Local TV
Community Events	Rural Town Event and Local Community Event	Regional/Local	Local TV/ Press, Local Press

Table 1. Types of major events according to Roche (Source: Roche, 2000).

Roche supports a conceptual definition that focuses on cultural, symbolic, political and construction aspects of mass popular culture and insists on dimensional criteria based on target and media coverage; precisely the last aspects are covered by Guala (2015), which underlines the fact of the incompleteness of this analysis leaving out relevant events such as film and music festivals, large art exhibitions, international political summits, European capitals of culture (Table 1). Guala proposes a new scheme referring to criteria such as content, scale, actual or potential users (target/market), the media interested in the event and the budget. According to the latter classification, the Olympics and Expos are part of two different categories based on the different "weight" of the TV coverage: the Olympics are defined mega & media, together with the World Cup; Expos are defined mega-events, mutually with international fairs. Considering the objective and context of the research, keeping in mind these classifications, we will continue to focus exclusively on the Olympic Games which constitute the most significant and well-known example of a mega-event.

Given the complexity of mega-events and the relative lack of research in them, the literature to explain why they occur is not well developed and therefore carefully to handle.

More naive or foreseen approaches tend to pay attention to the motivations of organizers or to read off the occurrence of the event from the economic needs of host cities and/or countries. Speculative social theoretical accounts suggest the relevance and meaningfulness of such events in the contemporary period concerning ordinary people's interests in identity and in 'life-world' structures of personal space and time under social conditions which tend to threaten these interests. Notwithstanding, the main lines of analysis

of mega-events have tended to emphasise either political or economic factors connected respectively with the building of nation-states or development of capitalism, or both (Roche, 2000). Mega-events have tended to be the productions of political leaderships and economic elites and the fact that they are oriented towards effectively absolute planning deadlines has often lent their organization capacity for a certain degree of authoritarianism even in otherwise solidly democratic politics. That being stated, mass publics often participate in such events and can make use of them in interpersonal and collective ways which have not been anticipated or controlled by event organisers. Recently with the emergence of the phenomenon of globalization mega-events have been seen in terms of a mixture of political economic and cultural globalization processes. The former can be analysed as the creation of transient and “glocal” urban hubs of international and global political and economic networks (Roche, 2000). Instead, the latter involves producing mega-events as a spectacular media show and organizing the worldwide transmission and mass reception of the events in association with powerful global media corporations and their multinational corporation partners, which aim to use the media systems and the events as advertising and brand-promotion vehicles (Billings, 2008).

Host countries have traditionally used, and continue to use, the Olympic Games for a variety of nationalistic reasons, including such things as the promotion of nationalistic ideology, marking a new stage in nation-building, exposing national (or multinational) complexities.

Take for example the first of the modern Olympics events, in 1896. Greek nationalists attempted to permanently found the Olympic event in Athens, on the model of the permanent location of the ancient Olympics in Olympia. However, the IOC had already decided that the event should rotate among nations, successfully resisting this pressure. In 2004 Greece once again hosted the Games. Although the event was in many ways successful at the time, there is no doubt that the real costs and opportunity costs associated with the preparation and long-term impact of the event imposed heavy economic and political burdens on the state and Greek company. Given their 2004 experience, the Greeks may be relieved that their ancestors failed to win the argument in 1896 (Roche, 2008).

Countries may also use the Games to mark a new phase in their development, empowering them to set forth a new national identity and image. There are plenty of cases of this sort of application. They include Spain’s use in 1992 of the Olympics in Barcelona and also the Expo in Seville to mark a new post-Franco and new European Union Member status. They also include Australia’s use of the 2000 Sydney Olympics to attempt to mark a new stage in its national narrative in its decision to use the opening ceremony to symbolise its

commitment to the challenging ideal of multicultural nationhood. In terms of nation-building and modernisation (including in the sense of 'westernisation'), some of the main examples of Olympic events marking this in the post-war period have been staged by East Asian nations, namely Japan (Tokyo 1964) and South Korea (Seoul 1988).

Given the essentially inevitable interconnection of the Games with both the nationalism of the host nation and also, in contemporary decades, the commercial affairs of the IOC it can be argued that it is unusual that numerous complex messages are dispatched, for instance in terms of either internationalism or sub-nationalism. Nonetheless, arguably some Olympic Games have been used to convey these kinds of messages and values; thus, have had a significant internationalist dimension, notably in the part they have played in reconciliation after wars, despite the over-optimism of the IOC's and United Nations' recent efforts to promote specific 'Olympic Truces'.

Beyond the formal agreement treaties which concluded the 20th-century World Wars, Olympic Games events not only marked but began to celebrate peace, reconstruction, and a return to humanity and normality in national affairs and international relations. Post-war reconstruction about both World Wars was a long-term process for European nation-states. Concerning the First World War it is possible to see the Olympics of Paris in 1924 and Amsterdam in 1928. Comparably to the Second World War it is possible to see the Olympics of Helsinki in 1952 and Rome in 1960 (not to mention also the Brussels Expo of 1958) in this light. Beyond Europe something similar could be said about the Olympics of Melbourne 1956 and even possibly also of Tokyo 1964 and Munich 1972. Also, as long aftermaths of the Korean war, the fact that South Korea staged an Olympics in 1988, and that North and South Korea planned to march together at the opening ceremony of the Sydney Olympics 2000 can be noted in this context. At the least at the time the latter action was regarded as a notable diplomatic gesture and movement towards a possible future of peace and reconciliation on the Korean peninsula.

In terms of sub-nationalism, the Olympic Games have generally been used to promote host cities and regions in terms of their identities and economic prosperity. Besides, they have at times been used to promote the identities and aspirations of stateless 'nations' incorporated within multinational states. In the Games of Montreal 1976 and Barcelona 1992 efforts were made to use the events to represent respectively the Quebec and Catalan sub-nationalist identities of the host cities alongside of the Canadian and Spanish national identities of the host nations. On equally rare occasions the organisation and ritual of Games events can be disrupted by largely unrelated political movements interested in using the events' extensive

media coverage to bring specific political issues to the attention of the international public. The main symbols of this are the case of the 'Black Power' protest by US athletes at a medal ceremony in the 1968 Mexico City Olympics and the bloody intervention by a Palestinian nationalist group in the 1972 Munich Olympics, which involved the taking of Israeli athletes as hostages and ended tragically with the killing of both the hostages and the hostage-takers.

These examples indicate both the general usability of the Olympic mega-event for nationalist purposes of the host nations, but above all also the fact that a large event can be intentionally conceived as an instrument of urban policy. Overall, these relevant examples are linked to the fact that mega-events can also be used as useful tools to boost existing urban policies, assuming increasing importance in political, cultural, economic and social terms.

Undoubtedly, these are evidence which are mainly relevant in the field of the institutions; thus, there is a spatial variable that must be taken in consideration. Certainly, the organization of an Olympic Games has important spatial implications. Think of the flows of people that a city must manage for a limited time, or the plants, infrastructures and specifically built reception structures. Some are expressly requested by the IOC (for example the Olympic Village), others depend on the specific meaning and role attributed to the events, in particular their inclusion in the local urban policy. Also, the great events historically accompany the creation of symbolic architectural interventions, capable of becoming "landmarks" and therefore of distinguishing the site dedicated to the event. And normally, these landmarks are made by the so called archistars or international architectural studio. From these statements, mega-events seem to have established an enduring presence, popularity and memorability in modern society and have been staged regularly every four or five years in one nation or another with only rare interruptions in the case of major wars. Mega events bring international capital, tourists and investors with them and put the host city in the spotlight of the world (Braathen et al., 2014); it is more than a mere event that follows the intentions of the local elites whose work oriented towards economic development takes place in an environment of urban competitiveness.

2.2. The territorialisation of mega-events

So far, possible definitions have been sought for the phenomenon in question and for what reason it happens persistently despite its exceptional nature, several times complicated to manage. Naturally, it has a close relationship with the territory hosting the event and this section tries to better understand this aspect. Usually, a mega-event can be conceived of as a key opportunity for territorial production according to the 'territorialisation' approach set forward by Raffestin (1980), inspired by the work of Lefebvre (1974). According to Raffestin, territorialisation is the production of territory which is, in turn, a space produced by the activities carried out by syntagmatic stakeholders (i.e. who implement a programme). The Olympic Games are a clear case. The territorialisation of the event takes place through a process that, from the moment a city announces its candidature and is then selected to host the Games, sets off a series of transformations to make the site suitable for the event. These changes are followed by a period of de-territorialisation at the end of the Games when many of the infrastructures connected with them are dismantled and sometimes abandoned. The final stage, should it occur, is the reterritorialization that takes place when the territory that hosts the event is in some way able to re-appropriate the Games' legacy and convert it into an asset for future generations and into territorial capital (OECD, 2001). According to Dansero and Puttilli, what we observe at practice is a cycle of territorialisation, de-territorialisation and re-territorialisation (the T-D-R cycle) that is specifically produced by the mega-event and can thus be interpreted as the production of a 'project territory' modelled on the mega-events requirements. The aforementioned T-D-R cycle can basically be classified into three categories: nomination (or naming), reification and organisation. Respectively, the acts in these categories aim at symbolic control, material control and sense control and can be used both to the Olympic territorialisation stage, when actors and tangible and intangible resources are mainly oriented towards producing the event's territory and to the post-Olympic deterritorialization and re-territorialisation stages, when the host territory restores its own centrality and comes to terms with the event's legacy. Naming is a means of symbolic control of the territory. All Olympic events have given us examples of *accidental* identifiers: the Olympic stadium, the Olympic Parkway, the Olympic villages. Olympic naming starts as early as the bidding process, as references to the 'event territory' progress from the generic to the increasingly specific, using the classic terminology of the Olympic glossary. Even the Games' logo and the opening ceremonies are used to assign new meanings and create a different conception of the territory. Symbolic control may be

transitory, ending with de-territorialisation, or may persist the event, with the creation of new identities and new representations of the territory, inside its borders and beyond. In this case, these images can become the pretext for fielding strategies that exploit the power of the name for a variety of symbolic and material purposes (such as promoting tourism and territorial marketing policies). There can be no suspicion that reification, or in other words the material transformation of the territory, is the most noticeable aspect of Olympic territorialisation and the one that tends to last longest. It manifests itself through the construction of infrastructures that are directly connected with the event (the sports and tourist facilities), support it (the road systems connecting the venues where the event will take place) or change its material surroundings. In the course of re-territorialisation, the Olympic construction projects are one of the main inheritances left by the event and can be a meaningful asset, part of the territorial capital that can be drawn on in organising new events and, more generally, in promoting the area as a tourist attraction. The organisation is the means whereby the Olympic territorialisation process introduces sense control by picking milieus and constructing territorial artefacts through which programmes and strategies can be implemented. Organising an event like the Olympics gives rise to complex territorial structures that often do not coincide with anything that came before: they can be thought of as a temporary functional spatial system. In addition to the construction projects, the Olympics prepare a set of actors and networks of relationships that make it possible to stage the Games: management and auxiliary organisations, networks of businesses and local government, relationships between local and supra-local groups that work together and exchange views to organise the event. Through these stages of naming, reification and organisation, the event generates a significant increase in local territorial capital (physical, relational and reticular), which can also be used to increase a region's attractiveness, and the amenities it can offer for tourists (Dansero & Puttilli, 2010).

From this analysis, can appreciate the impact of the Olympic Games on tourism development in host territories. Properly, efforts to clarify the agreements between IOC and a specific city and the territorial evidences in the host area must be developed. Below there are further considerations regarding the key steps and the effects that a mega event brings on the territory and on the actors that interact with each other. Rather than a cycle, the following process can be viewed as a non-linear process.

2.2.1. Host City Contract as starting point

Basso claims that the right to organize the Games is granted to a city from the IOC session, seven years before the celebration of the event. The award procedure is standardized and is defined by the Executive Committee at each edition, and generally consists of three phases:

- "internal" selection, at the request of the city administrations concerned: the National Olympic Committees (NOC) select, among potential cities in the territory of reference, the city that will participate in the international competition for the assignment of the Games (the applicant city). After obtaining the approval of the NOC, the public authorities of the applicant city forward the application to the IOC.

- identification of candidate cities: the IOC Executive Committee selects, among the applicant cities that have submitted applications, the cities that will officially participate in the competition for the assignment of the Games, evaluating the answers to a first application questionnaire. Cities are required to provide financial guarantees - together with the national governments and private individuals involved - and to submit a specific Candidature File, which is then evaluated by a commission charged with evaluating the latter.

- assignment of the Games: having obtained the opinions of the commission, the Executive Committee draws up the final list of candidate cities that are submitted to the IOC session. The host city of the Games enters into a contract with the IOC (the latter called Host City Contract), governed by Swiss law. This contract defines the responsibilities assumed by the event organizers (city, NOC and local organizing committees).

The key idea is that the host city contract corresponds to the precise moment in which an extraordinary and specific production of strategic and/or binding plans takes place, carried out by all interested parties. Sometimes, this process can lead to a very particular condition, better known as the "state of exception" and explained in Agamben's work. Agamben (2005, p. 1) argues that the state of exception constitutes an imbalance between public law and political facts. Indeed, mega sporting events create this type of inequality by bringing in multinational corporate sponsors, for whom exclusive rights are required for sports venues and other public spaces. As a result, existing institutional frameworks are modified to meet the needs of international sponsors and private interests.

2.2.2. The Games as an intense shock to normal land government practices

How does the Olympic Games influence the normal practices of the local government? As preceding stated, staging the Games is a huge project which always leaves a durable mark on the host city and region as well as their residents. Consequently, for correct and adequate management during the mega-event, a considerable number of actors and institutions are called to dropping the routine activities for focus on the organization of the event. Hence, it is relevant to consider three variables: the city as a system, the Olympic Games as a disturbance or change to the normal urban practices and the attitude of resistance so-called resilience. Using the latter concept can be taught the complex phenomena of mega-event which influence considerably the territorial governance of the host city.
The term “resilience” originally started to be used in ecological disciplines and then the definition applied in the urban context has been identified as well. The word resilience was introduced in the ecological literature to read the behaviour of ecosystems under pressure. Indeed, resilience was determined as:

“… a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables” (Holling, 1973)

This definition highlights the value of the capacity to absorb change preserving the same features. Accordingly, if a perturbation deflects a system from an equilibrium point, a resilient system can revert to its original equilibrium level (Figure 1).

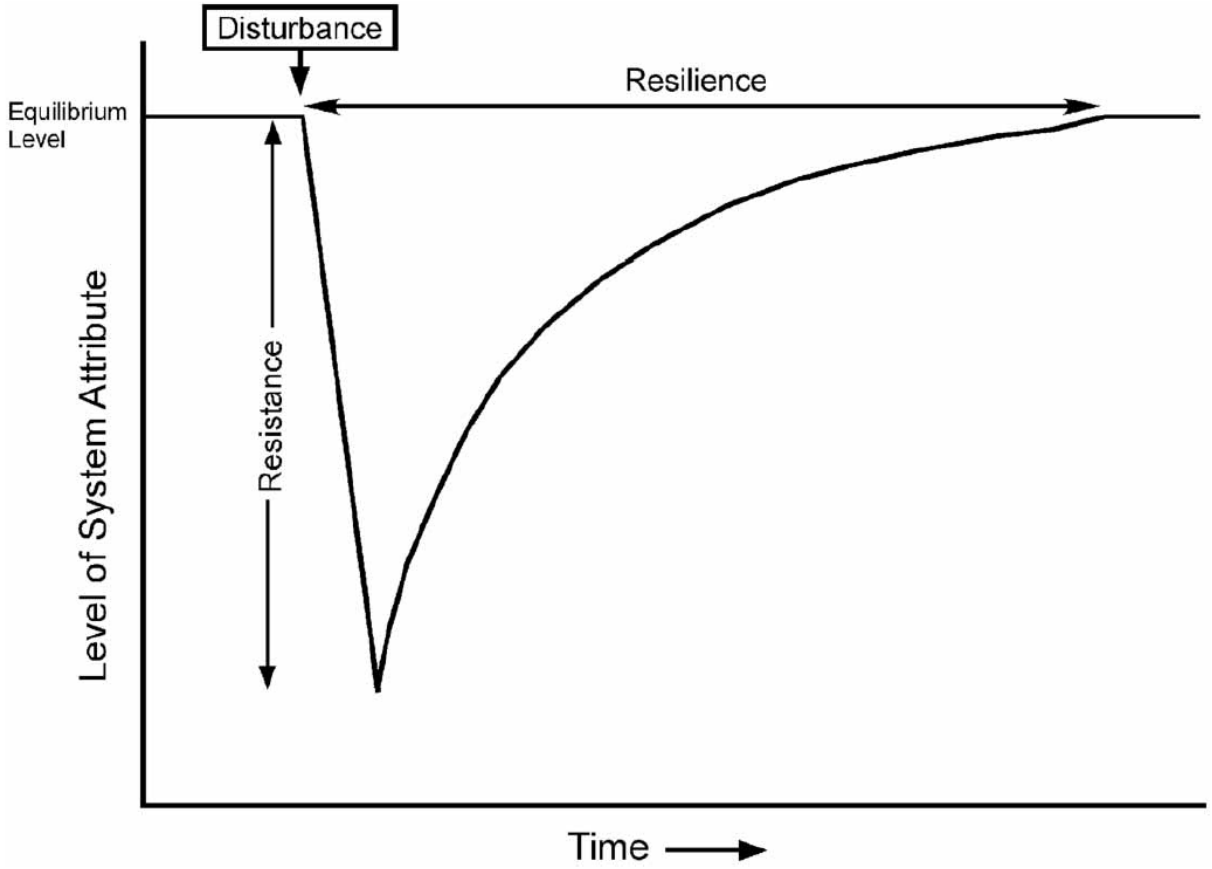

Figure 1. Diagrammatic representation of the traditional or engineering view of resilience (Source: Pickett et al., 2014).

Hence, a complex system such as the city must have adequate resilience to prevent the mega-event from interfering considerably with the normal actions and relations of the local government. If, in addition to this request, the Olympic Games intends to bring certain sustainable strategies into a specific territory, resilience becomes a fundamental attribute. More specifically, ecological resilience is particularly appropriate to urban systems, given the extent and open-ended nature of the changes and challenges they face. Furthermore, resilience is a key concept for operationalizing sustainability (Pickett et al., 2014).
In the following section will be revealed how the IOC desires to implement the various sustainability strategies, although it is fundamental to premise that this intent is placed in a very specific context but distorted by the mega-event itself, as above explained. Before that, the last passage of the process must be illustrated.

2.2.3. The Olympic legacy

Furrer (2002) argues that hosting the Games can never be said to be exclusively positive or negative. There is a mixture of both in all cases. Staging the Olympic Games can have multiple impacts on a host city or region. There can be physical, economic, environmental or social.

Economic benefits

The most widely publicised benefit of hosting the Games is the prestige of setting the host city "on the map". This Olympic investment is, for the most part, a share of the IOC-negotiated TV rights fees and sponsorship deals and represents approximately half of the organising committee's operating budget (Furrer, 2002). Such investment also acts as an attraction for other public or private investments that in turn allow the city to improve its facilities and infrastructure. For example, investments in transport infrastructure improve the mobility of people and goods, which is one of the keys to economic development in cities.
In macroeconomic terms, the Games is an effort by the host city or region to bring investment or to establish new trade relations. Other expected benefits are increased income and employment. As seen in the previous passage, hallmark events studied have often presented an opportunity to gather substantial public and private investments and have induced immediate or longer-term economic effects in many sectors, such as property, employment or tourism. In many cases, the Olympic Games have closed their accounts with a profit, which normally funds local sports communities for years to come and this favour the empowerment of the cultural and social role of sport, in the widely sense.

Construction and urban renewal

One of the most striking instances of advantages connected with hosting the Games is that of enhancing fundamental structural changes in cities and regions. The most significant long-term changes which take place in an Olympic host city are the construction or upgrading of new sports and multi-functional venues as well as the modernisation of the transport systems and other infrastructures (such as water treatment, power supply and

distribution). These long-term changes can take various forms: enlarged airport capacity, new roads and tram lines, better public transport systems, large venues which can be used for mega-conventions, etc. All of the above, together with new hotel facilities, not only represent a significant improvement for the city life people experience every day, but also a meaningful legacy for tourism in the city, region and country by “raising infrastructural standards to levels appropriate for international tourists” (Essex & Chalkley, 1998). As the main example, can be used Barcelona which shift from typical industrial city to flexible city with services and knowledge as main key sectors (Figure 2).

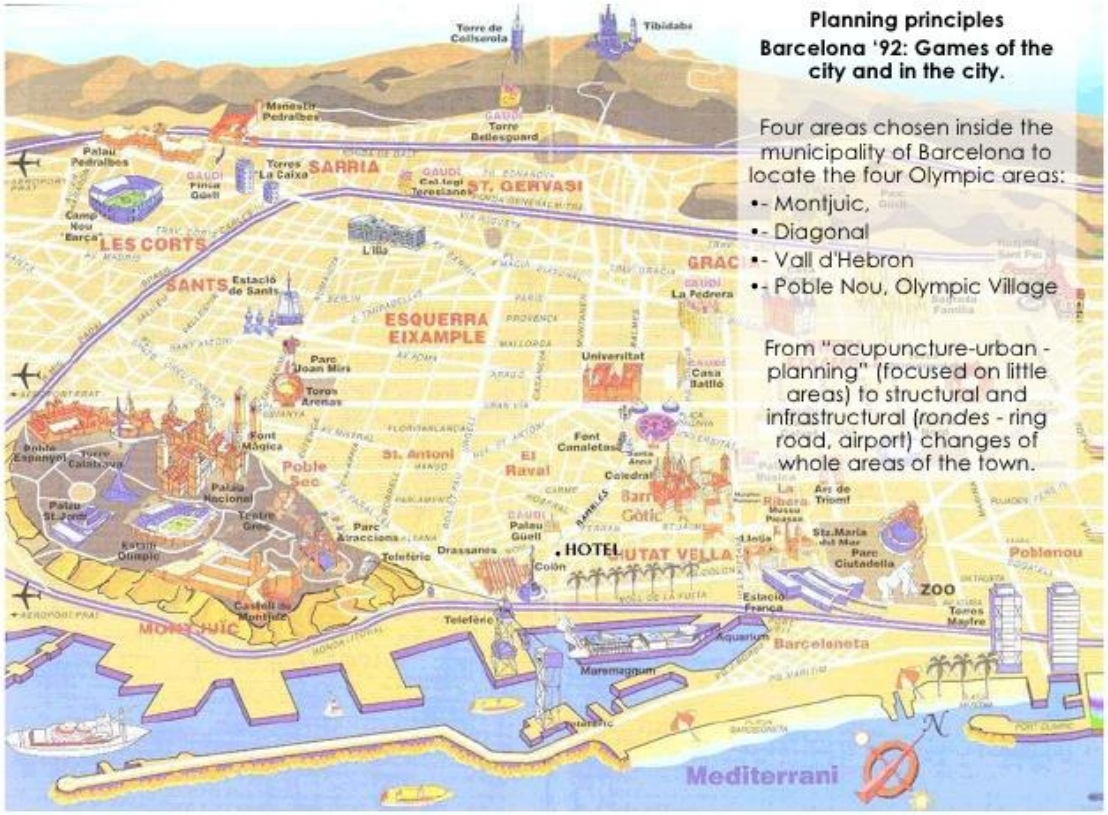

Figure 2. Urban renewal and acupuncture urban planning in Barcelona due to the 1992 Olympic Games (Source: www.slideshare.net/maybeetomorrow/barcelona-1992-olympic-game).

Social benefits

Socially, the Games can provide a unique opportunity for improving building skills and capabilities among the population interested. Being at the centre of the world’s attention for two weeks and successfully hosting the Games may function as a showcase of new

technological developments or promoting the depth of talent, creativity and organisational skill of local business. The Games also represent an opportunity to spread the practice of sports across all layers of the host population, as well as promote Olympic education and Olympic values among the young generation of the host country. Values such as respect, tolerance, fair play, the balance between a strong body and mind, pursuit of excellence and others do contribute partially to building a better and more peaceful world (Furrer, 2002).

Environmental benefits

Although the Olympic Games imply new construction and additional pressure on the environment through increased traffic, water consumption and waste production, they can nevertheless bring several environmental benefits. For instance: new standards in the building industry, use of renewable energy sources, innovations in environmentally friendly technologies, upgrade of water and sewage treatment, new waste management systems and, very importantly, environmental education programmes.

2.2.4. The Olympic burden

Under this heading, should be discussing some of the negative effects the Olympic Games may have on the host city and its citizens. Only a reliable and impartial examination of the obstacles to success will allow organisers and city planners to draw the maximum benefit from the Games and turn it into a legacy (Furrer, 2002).

"White elephants"

The first image that comes to mind is that of half-empty and costly "white elephants". This expression refers to over-sized venues and facilities that were planned with Olympic-size companies and ticket sales in mind. White elephants are designed to showcase the local economy and engineering courage instead of fitting them into long-term urban planning policy and responding to the local population's needs relative to leisure and cultural facilities (Furrer, 2002). Another type of white elephant can take the shape of new hotels constructed

in the lead-up to the Games. Hotel room oversupply after the staging of the Games may have significant effects on the host city or region's hotel industry.

Unequal distribution of the Games benefits

Realistically, hosting an event of the Games' magnitude must produce winners and losers. The challenge for public authorities and city planners is to avoid a situation whereby the positive effects of the Games are primarily to the benefit of the prosperous classes. Evidence gathered from general urban studies suggests that cities with growing inequalities not only see an increase in the marginalisation of social groups and crime rate but also lose many of their attributes and much of their selling power. Therefore, an important question that remains for the most part unanswered is that of equality in the distribution of the Games benefits. Several observers have warned about the risk of increased inequalities between different strata of society or between different geographical parts of the city. This potentially adverse impact can often be related to the concentration of new Olympic venues and infrastructures in specific areas of the host city, processes of gentrification, increase in public debts which may impact heavily on future public investment in various services, and a lack of consultation with local communities who become dis-empowered to act on issues regarding their future. Also, the concentration of new developments in derelict urban sectors may lead to a gentrification process, whereby the needs of the poor and social justice, in general, get overlooked.

The Games of city entrepreneurs

Hosting an event with a magnitude of that of the Olympic Games often means that there are winners and losers among categories of citizens. An ideological interpretation of the Games points to how the event may be used by new types of city entrepreneurs who pay less attention to public services and welfare. The entrepreneurial conception of the Games can result in a lack of public consultation when planning for major projects. Several observers have attempted to show how anti-democratic procedures of agencies responsible for planning hallmark events can lead to major events serving the interests of private capital. While theories of elite Games managed by city entrepreneurs as well as unequal distribution

of the event's benefits may hold to a certain extent, evidence also suggests cities bidding but integrating Games concepts in a long-term harmonious way and using the Games as leverage for positive change reap some concrete benefits for the majority of residents.

2.3. Prospects from the IOC towards a definition of a mega sustainable event

If up to this point it has been plausible to pick on a wide range of analyses and academic papers; the time has come to explore a new dynamic, or rather an innovative trend that embraces an influential mainstream concept. The topic concerns strategies to make a mega-event sustainable. Thus, it is relevant to proceed with a slight overview of the concept of sustainability and to this will be added the prospects offered by the IOC to pursue sustainability in the most recent Olympic editions.

The term sustainability has become part of our vocabulary in times relatively recent; in particular, it springs to be applied in academia around the eighties to get to today. There is no universally shared definition of what sustainability implies, with many different points of view on what it is and how it can be achieved. A reasonable definition may be that of the World Commission on Environment and Development which defines the term sustainability as the process to maintain the change in a balanced environment, where the exploitation of resources, the direction of investments, the orientation of technological development and change institutional are all in harmony and enhance the current and future potential for satisfying human needs and aspirations. The idea of sustainability stems from the concept of sustainable development. Precisely, the most popular definition of sustainable development is that which refers to the document Our Common Future, also known as the Brundtland Report, published in 1987 by the UN World Commission on Environment and Development. The report states that "sustainable development means development that meets the needs of the present without compromising the ability of future generations to satisfy the owner". Historically, three phases have been distinguished in the evolution of the concept of sustainable development: two-dimensional sustainability (economy and ecology), three-dimensional sustainability (economy, ecology and social dimension) and four-dimensional sustainability that joins politics or governance as a new dimension.

Another fundamental step for the recognition of the need to undertake a path of sustainable development was the 1992 United Nations Conference on the environment in Rio de

Janeiro. Subsequently, the adoption of the eight Millennium Development Goals in 2000 and the subsequent and current 2030 agenda for sustainable development 2015 which includes seventeen sustainable development objectives to be reached by 2030 must be remembered (Figure 3).

Figure 3. The 17 Sustainable Development Goals (Source: www.unicri.it/united_nations/un_mdg/).

Since the Rio Earth Summit where the Agenda 21 was unanimously adopted in 1992, many countries have been working towards sustainable development. While there has been some progress made in certain areas and many ideas and policy recommendations have been produced, implementation has clearly been slow in many ways. However, the journey towards sustainable development has not been straightforward and is far from being fully achieved. In fact, much progress result from local initiatives, thus putting into practice the well-known adage “think globally, act locally”. Little progress has also been made on the understanding of the inter-relationship between the three pillars of sustainable development. A large part of the focus has been put on the environmental dimension of sustainability.

With these considerations in mind, it can be argued here that the Olympic Games, by their multidimensional nature, exemplify the notion of a truly global event and may therefore

represent a very interesting investigative field to shed a new light on the debate over sustainable development in the *urban milieu* of post-modern cities.

Overall, the whole world faces notable challenges across a broad spectrum of social, environmental and economic issues. As a result, important issues such as social injustice, economic inequality and climate change are dealing with more and more people around the world. As the IOC pointed out, the sports community is not immune to the impacts of these problems. In particular, the document called the Executive Summary of the "sustainability strategy" (which refers to the 2020 Olympic agenda) states that the IOC believes the Olympic movement has both an opportunity and a duty to actively contribute to global sustainability in line with the vision: "building a better world through sport." This is why it is important for the IOC that, in September 2015, the United Nations General Assembly (UN) confirmed the important role of sport in supporting the 2030 Agenda of the United Nations for Sustainable Development and the 17 Sustainable Development Goals (SDGs) Indeed, the 17 SDGs for 2030 provide a common framework for organizations to explain how to contribute to sustainable development and address significant global sustainability challenges. These SDGs include the end of poverty, the fight against climate change, the fight against injustice and inequality and many other aspirations in to a better and more sustainable world. The principal purposes of the Olympic movement, including social development through sport, are already firmly aligned with several SDGs, in particular in the areas of health and well-being (SDG 3), quality education (SDG 4), gender equality (SDG 5), peace, justice and strong institutions (SDG 16) and partnerships for sustainability (SDG 17). By further incorporating sustainability into the committee's activities, therefore, the contribution to these SDGs is strengthened while contributing to diverse other SDGs, as represented in the following figure (Figure 4).

Figure 4. Key SDGs to which the IOC aims to contribute (Source: www.olympic.org/sustainability).

More in depth, the document presents five areas of interest that reflect aspects of the IOC's activities that have the most significant interaction with sustainability. They were also selected considering today's main sustainability challenges and how the IOC and stakeholders believe that the IOC can contribute more effectively. As the summary points out, the five areas of interest and the following nine objectives are strongly interconnected and should be considered as a whole. In summary, the framework of the IOC sustainability strategy is illustrated below (Figure 5).

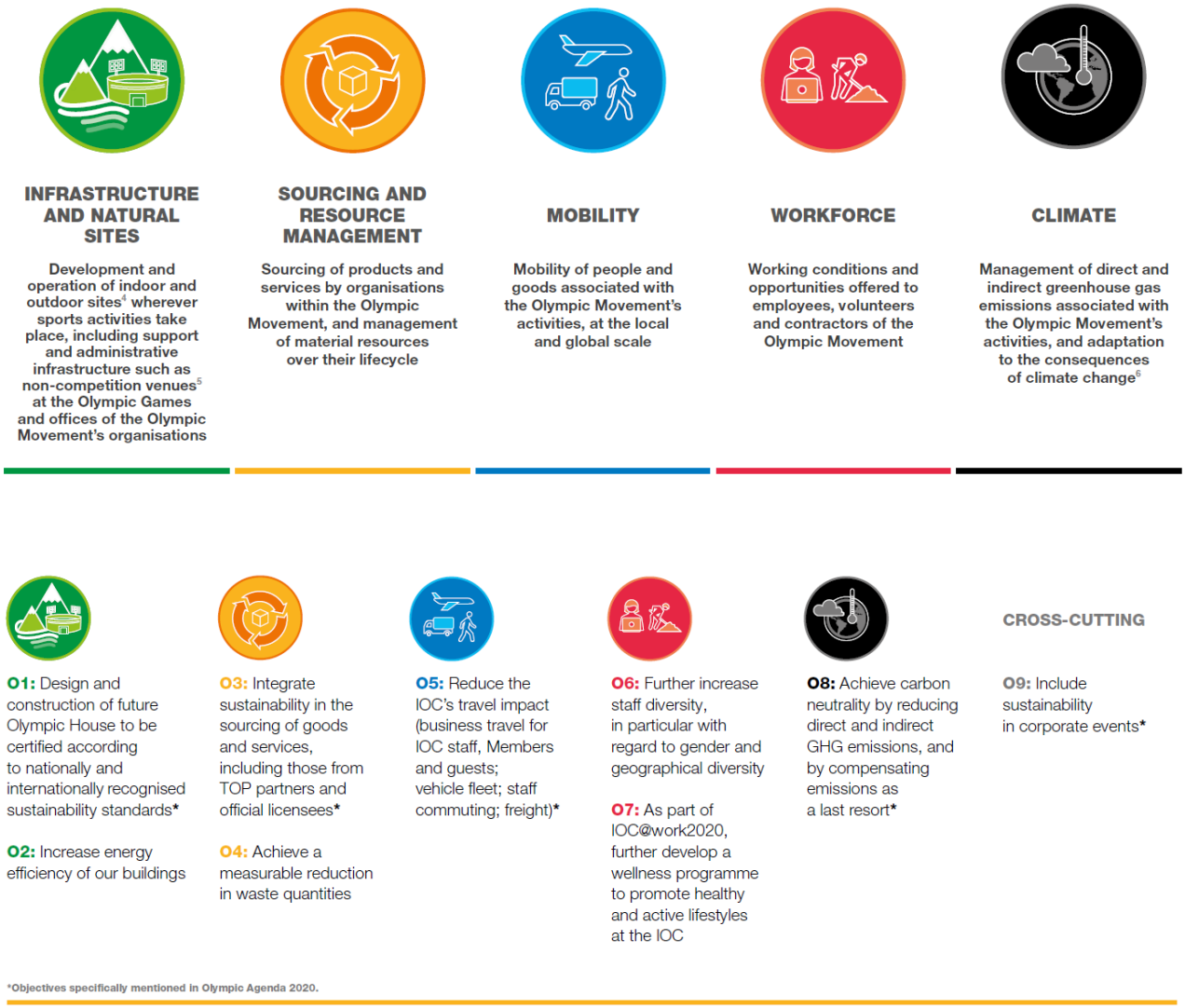

Figure 5. The IOC Sustainability Strategy framework is composed by five sustainability focus areas and nine objectives (Source: www.olympic.org/sustainability).

The five areas are divided into infrastructure and natural sites, sourcing and resource management, mobility, workforce and climate and all these fields are strictly linked to the process of the territorialisation and management of Olympic Games. Consequently, nine general objectives are delineated, with the last as cross goal which remember to include the sustainability even in corporate events. Interestingly, the first edition of the Olympic Games that will fully benefit from changes initiated by the Olympic Agenda 2020 in question, will be Paris 2024. Particularly, for the following Olympic Games planning process such as PyeongChang 2018, Tokyo 2020, Beijing 2022 and Paris 2024, the IOC worked closely with

the Organising Committees of the Olympic Games and host cities to align their practices with the Sustainability Strategy for 2030 below explained in detail (Figure 6).

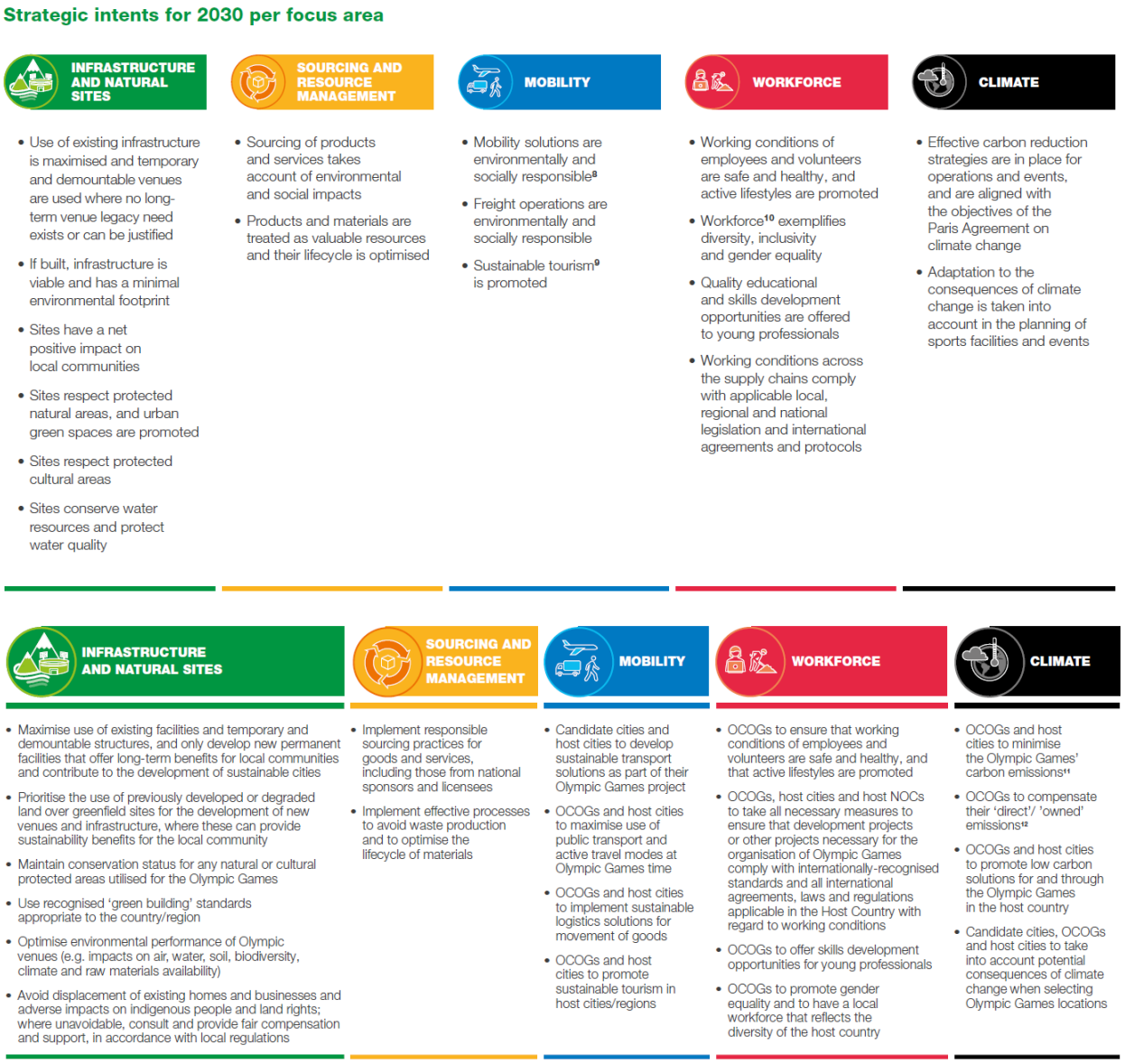

Figure 6. The IOC Sustainability Strategy for 2030 as intents and the consequently requirements for candidate cities, OCOGs, host cities and their delivery partners (Source: www.olympic.org/sustainability).

The strategic intents are subdivided into the five focus areas presented for the IOC sustainability framework and add some interesting points with respect to the previous objectives. Particularly, are promoted some interesting initiatives such as sustainable tourism, maximise the use of existing facilities or temporary venues and the adaptation of some measures for taking into account climate change consequences. Furthermore, the Executive Summary published further indications on annex which present some necessary

requirements for candidate cities, Organising Committees of the Olympic Games (OCOGs), host cities and their delivery partners. As a result, the process of implementation of sustainable actions is brought by the OCOGs which must respect the strategy lines made by the IOC; recently, sustainable goals are carried out through a specific sustainability plan created by the OCOG with the relative stakeholders.

As a conclusion of this brief account and for making the bridge to the next topic, it seems that these indications are the product not only of an evolution of the sustainability concept taken by international organisations such as UN but itself metamorphosis of the Olympic movement in terms of environmental sustainability mainly due to the latest agenda created by the IOC. Undoubtedly, may be useful to retrace some historical steps that involve the sustainability paradigm in the IOC's vision and to discuss the issues surrounding environmental sustainability of Summer Olympic Games, which have more impacts than Winter ones and have had an impact on the natural environment.

3. MEGA “SUSTAINABLE” EVENTS AND OLYMPIC GAMES

After a theoretical analysis of the mega-event concept, the relationship within a specific environment and the recent IOC’s sustainability strategy, it is possible to go further and making a comparative analysis between the last sustainability plans made by the OCOGs in London, Rio and subsequently the last edition in Tokyo. Before this step, an overview of the development of environmental sustainability in the Olympic Games will be provided. The latter is essential for introducing the latest measures in the context of IOC and host cities; firstly, the pursue of a certain degree of sustainability was related to different instruments or initiatives until arriving a definition of a clear plan called sustainability plan adopted for the first time in the London edition.

The place given to environmental considerations in the preparation and staging of the Games is now being analysed, taking recent editions of the Olympic Games as examples.

Such concerns for an environmentally friendly way of planning and organising the Games have taken far more importance over recent years, but it must be set against the danger of promoters and Games organisers using such mainstream “Green Games” notions for the sake of good reputation (Furrer, 2002). This indication can be used as a further research investigation, and the final overview shall try to give a response and a critical opinion over this matter. Through the review of some aspects of the latest editions, we can arrive at the cases studio of London, Rio and Tokyo; before that process, a point in the chronicle should choose. Accordingly, the adoption of Agenda 21 by the Olympic Movement, which was examined during the third IOC World Conference on Sport and the Environment in Rio in 1999 and approved by the IOC Session in Seoul in June 1999, triggered the discourse on sustainable development in the context of Olympic Games.

However, the principles of the Olympic movement Agenda 21 are wider than just the environmental considerations. The aim is also to increase the involvement of the local population, improve the socio-economic and health benefits they derive from it, strengthen international cooperation projects for sustainable development, help combat social exclusion, encourage new consumer habits, promote a sports infrastructure which is even better adapted to social needs, and further improve the integration of development and environment concepts into sports policies (IOC, 1999). Accordingly, this last statement follows the well-known definition "think globally and act locally"; the doubt is linked to the fact that it will always be possible to pursue these goals and achieve them, especially in large cities with their social and environmental problems?

3.1. The evolution of environmental sustainability at Olympic Games

Considering its conception in 1894, the Olympic Movement has embraced two dimensions of Olympism; sport and culture. It was not until the 1990s, that the IOC acknowledged the significance of the environment and sustainable development as the third dimension. The trigger for this shift towards recognition of the importance of environmental sustainability was the Winter Olympic Games of Albertville in 1992 (Konstantaki, 2018).

Due to serious environmental disasters during the staging of the Games in Albertville, the environment became the focus of attention and emerged as an issue of global social policy at the Earth Summit Conference in Rio de Janeiro (United Nations, 1992). An impressive change following the Earth Summit was IOC's announcement to alter the sequence of the Winter and Summer Olympic Games. This meant that Lillehammer in Norway would stage another Winter Olympic Games in 1994, just two years after Albertville, and was a strategic decision aimed at rehabilitating confidence in IOC's association with the Olympic Games and its role in guaranteeing environmentally friendly games since Norway is an environmentally conscious country. The Lillehammer 1994 games were, indeed, an environmental success if compared with the previous edition which was reinforced by the personal involvement of the Mayor of Lillehammer, Gro Brundtland, and his commitment to producing 'green games' as a member of the United Nations World Commission on the Environment and Development. Notwithstanding, establishing environmental policies linked to hosting the Olympic Games was required. In 1994, the IOC introduced an environmental policy within its requirements for cities aiming to host an Olympic Games which must respect this policy with an elaboration of tools evaluated by the IOC during the bidding process. One year after, the IOC organised the first World Conference on Sport and the Environment in Lausanne which has since been held every two years. The conference was supported by the United Nations Environment Programme (UNEP) and aimed to address four major issues as governmental responsibilities, duties of the Olympic Movement, education and the environment, and sports industries' responsibilities. A practical outcome of the conference was the launch of the 'Eco-wave' movement by the Federation of the European Sporting Goods Industry (FESI). Eco-wave phenomena introduced 14,000 International Standard Organisation (ISO) ecological standards for businesses (Konstantaki, 2018).

In 1996, the IOC set up the Sport and Environment Commission to supervise submitted bids and environmental sustainability of Olympic Games host cities. The Commission reviewed the information in the Olympic Charter and added a new paragraph defining the importance

of environmental protection. The Commission also changed the dimensions of the Olympic Movement to include the 'environment' as a third dimension alongside sport and culture. In 1999, the IOC committed the Olympic Movement to the concept of sustainable development, through the Global Plan Agenda 21. In this agenda, the IOC provides a reference tool for environmental protection to be used by host cities to encourage and support a responsible concern for environmental issues and promote sustainable development (IOC, 1999). Among other policies, the IOC developed a list of environmental requirements concerning the cities bidding to host the Olympic Games. These policies, in theory, demand more responsibility and accountability from the Olympic Games Organising Committees (OGOC) and bind them to co-operate with respective agencies, to plan and implement environmentally safe projects (Girginov and Parry, 2005). Accordingly, and as highlighted previously, each OGOC has the direct responsibility to territorialise plans and projects which must respect guidelines that facing to common transnational challenges. This is the reason of it is possible to find a plethora of different effects due to hosting an Olympic Games and, hence, must be necessary and quite interestingly adopting a comparative approach in presenting the mega "sustainable" events.

3.1.1. Historical account of environmental initiatives at Olympic Games

A notable turning point in the "greening" of the Games took place in 1993 when the Sydney 2000 Games Bid Committee published the Environmental Guidelines for the Summer Olympic Games before obtaining the right to host the Games of the XXVII Olympiad. These guidelines not only served as a great selling argument by convincing many IOC members to determine Sydney as the host city but also guided much of the Games planning and preparation as well as producing an environmental legacy for all future editions of the Olympic Games (Furrer, 2002). Several environmentally friendly technologies and processes were incorporated into the planning and operations stages such as the widespread use of solar energy at the Olympic Village and low emission public transport. These Games were used as an innovative platform to showcase some of the latest developments in green technologies; as underlined by the Official Report of the XXVII Olympiad "the construction story of the Sydney 2000 Olympic and Paralympic Games was dominated by two aims – the development of world-class sporting venues on a very constrained site and the protection of the natural environment".

Accordingly, the transformation of the Homebush Bay area from a polluted, industrial wasteland to a revitalised complex of venues, wetlands and parklands by the New South Wales State Government is one of the most striking environmental achievements, and legacies, of the Sydney 2000 Olympic Games (IOC, 2001). Attempts at a wide consultation process were made with the setting up of the Homebush Bay Environmental Reference Group to provide advice on the remediation programmes at Sydney Olympic Park and surrounding areas. It contained community groups, environmental organisations and academics and technicians. Green groups such as Greenpeace were involved from the early stage of the bid and were then integrated into the overall planning of the Games. The monitoring of the project was achieved through three separate Ecology Programs:

- Program 1 involved the development of an ecology data bank (through geographic information systems), an electronic record of the changing status of the environment at Homebush Bay.
- Program 2 involved determining the condition of rehabilitated lands and providing technical tools and training to enhance their management.
- Program 3 was created to promote community understanding of pollution issues and extend Sydney 2000's remediation strategy to areas beyond the Homebush Bay site.

Furthermore, environmentalists took an active part in the drafting of the "Environmental Guidelines" adopted by the organising committee. Also, important to note is the involvement of sponsors in the Sydney environmental strategy with several of them adopted green initiatives and showcased them during the Games (Furrer, 2002). Green groups such as Greenpeace and an environmental watchdog called Green Games Watch 2000 encouraged Games sponsors to go over and above their normal procedures in areas such as recycling, waste management, lighting systems and CFC-free cooling systems (IOC, 2001). On World Environment Day 2001 the United Nations awarded Sydney the Global 500 Award for environmental excellence. Even the hard to please green movement gave grudging praise (Furrer, 2002). Indeed, the adoption by the Sydney organisers of the "Environmental guidelines for the Summer Olympics" has established a new and high standard of environmental performance for future mega-events.

One of the critical aspects related to the legacy left were the constructions of sports facilities around the Australian city. A first, and in a long-term, the constructions could appear like a big "white elephant" because in the city there were already stadiums from the private sector.

However, although the planning for promoting the games leads to an underutilization of the sports facilities, the social impacts were high, by promoting the sustainability conception and improving a less privileged region (Mataruna, 2018).

The Athens 2004 Summer Olympic Games in Greece presented a well-defined environmental policy, albeit on paper only. According to Girginov and Parry (2005), environmental policy stressed four important elements:

- the location of the Olympic venues was in full alignment with the land use and sustainability plan for the metropolitan area of Athens.
- in all Olympic venues, the post-Olympic use excluded the construction of hotels, offices, private houses, casinos and nightclubs/restaurants (Law 2730/99).
- in all Olympic venues, the number of construction permits was kept very low.
- all temporary constructions for the Olympic Games would be removed at the latest six months following the completion of the Games (included in Law 2819/2000 on the establishment of a private company for the Olympic Village, protection of Olympic symbols and other provisions).

Unfortunately, this clearly articulated, and legally substantiated environmental policy was not implemented properly or with due consideration (Furrer, 2002). Horst (2012) reported that poor planning left the city stuck with paying maintenance bills for poorly designed stadiums that were vastly underused following the Games. Besides, the construction of Olympic facilities did not account of open spaces, which were negligently destroyed instead of being retained as green spaces (Reyes, 2005). Despite these drawbacks, several new Olympic installations support the rehabilitation and upgrade of urban and suburban areas. Projects such as the construction of the Olympic Village, the Faliron Coastal Front and the Olympic Sailing Centre are among the best examples of interventions which will contribute to a better quality of life for Athenians. Similarly to Barcelona in 1992, Athens is reconnecting its city centre with the sea through the redevelopment of the Faliron Coastal Area, host to manifold Olympic competition venues. Also important to note are the regeneration of Athens' historical centre and improved accessibility through a new pedestrian link between historical centres should prove to be a significant legacy for the city of Athens.

In any case, the sustainable impact of the Games' event in the sphere of the environment was not negative in all aspects; while the Games' impact on energy consumption seemed vague and not clearly traceable, the Games served especially on the issue of transport

networks as a strict pressure factor that finally resulted in a massive reengineering of the public transport system and the road network (Tziralis et al. 2008). Thus, it is transport which is likely to become the biggest and most visible Olympic legacy in Athens, improving the rather poor prevailing mobility conditions of most Athenians and the air quality (Furrer, 2002).

The Beijing 2008 Summer Olympic Games in China catalysed a major project of urban transformation and new infrastructure development. Most of the capital invested in the 2008 Olympic Games was spent on infrastructure that helped shape and fosters greater environmental awareness among the public and was an opportunity to showcase China's commitment to growing in an environmentally sustainable manner (Aichi Expo, 2005). The Beijing 2008 Olympic Games highlighted several environmental issues, including the city's poor air quality (Busa et. al., 2010). During the bid phase in 2000, Beijing set ambitious goals to improve the city's environment; the organising committee (BOCOG) and the municipality of Beijing put words into practise with a specific and ambitious environmental master plan. An initial Environmental Impact Assessment framework had submitted during the bidding stage by Beijing and BOCOG is established its Environmental Management System (EMS) in line with ISO 14001 standards[2]. The goals ranged from addressing air and water quality and waste management to introducing environmental considerations in the development of new infrastructure. As specified in the UNEP environmental report on the 2008 Games, to accelerate the achievement of environmental goals, Beijing decided to move forward the deadlines of several existing environmental targets in the Beijing 'Environmental Master Plan'. Beijing also launched educational campaigns for sustainable development and aim to raise the nation's environmental awareness. The outcomes became visible also before the Games started through new wastewater treatment plants with waste reduction and recycling schemes at the venues, expanded solid waste processing facilities, increased forestation and green belt areas and an improved public transportation fleet (Konstantaki, 2018). These initiatives were achieved due to cooperation with sponsors on environmental sustainability and dialogue with environmental NGOs (Busa et. al., 2010). The multitude of green initiatives is proving to be a vast legacy of the 2008 Games for the people of Beijing and the whole of China; the catalyst effect of the Games on promoting the city's sustainability represented a huge opportunity for the world's most populated country, which is even

[2] The abbreviation ISO 14001 identifies a technical standard of the International Organization for Standardization (ISO) on environmental management systems (EMS) which establishes the requirements of an environmental management system of any organization.

nowadays facing rapid development and experiencing the challenges of rapid urban growth and expansion (Furrer, 2002).

Before of going further with the presentation of the two sustainability plans made in London and Rio de Janeiro, a first comparative insight can be showed even including the mentioned cases. Table 2 highlight the most notable environmental initiatives at Olympic Games and their impact (positive or negative).

Host city/country	Year	Impact	Description of environmental initiatives	Source
Sydney, Australia	2000	positive	'State of Environment pre-Games Report'; biodiversity preserved; 425 hectares restored parkland; successful water / waste recycling	IOC (2013-Legacy)
Athens, Greece	2004	negative	Poor implementation of well-defined environmental pre-Games policy; Olympic facilities built on open green spaces; environment ignored	Reyes (2005)
Beijing, China	2008	positive	Beijing 'Environmental Master Plan'; improved air and water quality; recycling at venues, sustainable transport; increased forestation	Busa et. al. (2010)
London, United Kingdom	2012	positive	LOGOC Sustainable Sourcing Code; Commission for a Sustainable London 2012; re-used buildings; 96% of construction material recycled; ; ISO 20121	Horst (2012) IOC (2013-Legacy)
Rio de Janeiro, Brazil	2016	negative	Poor implementation of Sustainability Management Plan; poor air and water quality; threat of ZikV; Guanabara bay polluted with human sewage	Petersen et al. (2016), Brooks (2016)

Table 2. Environmental impact and initiatives of summer Olympic Games (Source: Konstantaki, 2000).

This overview has only the aim of compare effects from environmental actions on cities from the literature and is a simplification of a phenomena more complex which can also affect another dimension such as the economic and social one. Hidden aspect of environmental policies that influence different fields of the sustainability will be dealt after the presentation of the sustainability plans.

3.2. London 2012

3.2.1. The discourse of the plan

The London 2012 Summer Olympics in the UK presented an accurate sustainability plan for the first time. This sustainability plan outlined the commitment to ensure that the 2012 Games were managed in a way that remained economically sustainable, but also environmentally sound and socially and ethically responsible. London placed sustainability at the heart of its bid for the 2012 Games, framed by the concept of "Towards a Single Planet Olympics". Social, economic and environmental sustainability remained at the heart of the vision for 2012. Much of the Sustainability Plan focused on the development of the Olympic Park, the main site for the Games in the Lower Lea Valley east of London. This reflected the situation five years before the event with the programme priorities and the relatively early stage in terms of operational planning. In this regard, the Sustainability Plan (2007) points out that:

"Sustainability itself is a rapidly evolving discipline; new methods and technologies are constantly developing. As we move from preparing for the Games to staging them, to converting venues and facilities for traditional uses, we must be able to respond to new situations and take advantage of new practices. For these reasons we are committed to a process of continuous improvement and we welcome feedback and dialogue with interested stakeholders to help us achieve the best results for sustainability throughout the project" (LOCOG, 2007).

From these statements, it seems that sustainability was at the top of the priorities even for the bidding process; in reality, the facts tell another story and just for understand those will be useful go back at the time of the candidature.

The failed attempts by Birmingham for the 1992 Olympics and Manchester for the Games of 1996 and 2000 brought two important facts. The first was that there was real benefit from bidding for the Games in terms of place promotion, leverage of funding and internal planning goals. The second was that there was little chance of any British city other than London attracting the level of IOC support needed to win the Games. However, it was only when London regained a strategic authority (with the creation of the Greater London Authority in 2000) and a Mayor that the political infrastructure was established to facilitate a London bid.

The British Olympic Association (BOA) commissioned a feasibility study in 1997 for a London Olympics which acknowledged that from a British perspective simply focussing on the benefits to sport would not generate the required stakeholder support for a British bid and that 'regeneration, legacy, employment, tourism, new housing and the health of the nation' would need to be considered in supporting the whole bidding exercise (BOA, 2008). The BOA study examined two potential sites: West London centred on the proposed multi-purpose reconstruction of Wembley Stadium and East London based on the Lea Valley. It was immediately apparent that the benefits and potentials for creating long-lasting urban development, economic and social change in East London site far surpassed the Wembley option. With the support of the London Assembly and Mayor and formation of a stakeholder group, consultants were appointed to consider the availability of land and the cost-benefit analysis of bidding for and staging the Games in 2012. At this 'internal' stage of the deliberation, environment and sustainability were not in the brief and not granted. Neither is mentioned in the consultant's report from May 2002, apart from the note that 'quality environments' should be delivered to ensure 'a viable and long-term legacy' (ARUP, 2002). The regeneration was stressed at this point, with the once-in-a-lifetime opportunity provided by 'an area of low-intensity use and physical dereliction', with exceptional transport connectivity near the centre of London. Still, when London prepared its bid between 2003 and 2005, the dictates had changed. The bid team increasingly worked to include ideas of sustainable development and geographically concentrated Games focusing on the legacy. By the time the bid was submitted in 2004, the effects of the environmental shift were fully felt. In the Candidate File, London produced a plan for a nucleated Games, with temporary facilities where no long-term legacy use could be justified. It emphasised the integral role that sustainable development would play over the seven years of preparation and delivery of the Games and beyond to post-Games legacy. Singled out for attention were the goals of low carbon, zero waste, conserving biodiversity, and promoting environmental awareness and partnerships. Working with BioRegional (an organisation set up in 1992 to promote sustainability in everyday living) and the World Wildlife Fund (WWF), London 2012 also adopted a One Planet Living agenda, as mentioned before. This was essentially a programme to promote sustainable living within the capacity of our one planet rather than the three planets that would be required if the world consumed at the rate of the UK or the five planets if global consumption matched the proportions of North Americans. A joint document entitled Towards a one planet Olympics, which accompanied the bid, claimed to have created an 'implementation link' between the Olympic Movement's Agenda 21 and the

Global Impact Studies which monitor the implementation delivery and legacy of the Games (LOCOG, 2007). A total of 10 One Planet Living Principles were listed against actions which would inform the planning and delivery of the Games and the subsequent legacy. The principles are the following: zero carbon, zero waste, sustainable transport, local and sustainable materials, local and sustainable food, sustainable water, natural habitats and wildlife, culture and heritage, equity and fair trade and, finally, health and happiness.
This gave the London bid a distinctive mantra that encapsulated the environmental message graphically and introduced a brand-new perspective on the environmentalist rhetoric that countered previous Games' slogans.

3.2.2. Objectives and strategy

As indicated in the Sustainability Plan drafted in November 2007, the Sustainability Policy identifies five priority themes according to One Planet Principles, where London 2012 and the stakeholders believe they can have the most impact and best contribute to achieving legacy aims. These themes form the basis for the Sustainability Plan and are the following:

- Climate change: the Plan aims to minimise greenhouse gas emissions, from construction to legacy, and by ensuring that legacy facilities can cope with the impacts of climate change.
- Waste: London 2012 is committed to minimising construction waste, sending no waste produced during the Games to landfill, and acted as a catalyst for encouraging the development of new waste processing infrastructure in east London and promoting changes in public attitudes and behaviour.
- Biodiversity: London 2012 minimised the impact of the Games on the ecology of the Lower Lea Valley and at other Games venues during the planning construction and operational phases; it aims to leave a legacy of enhanced habitats within the Olympic Park and try to foster an understanding of the importance of biodiversity in supporting healthy lifestyles.
- Inclusion: the Games seeks to be open to all, promoting inclusion and change, especially towards disability, celebrating the diversity of the people of London and the UK, and also creating new employment, training and business opportunities,

contributing to the social and economic regeneration of communities living around the Olympic Park site and the wider Lower Lea Valley.

- Healthy living: the Games can be used to inspire people across the country to take up sport and develop active, healthy and sustainable lifestyles.

These are presented as separate categories, but they support each other, and each theme embraces all three conventional trends of sustainability: economic, social and environmental (LOCOG, 2007). In this light, the most striking example of cross-cutting actions on sustainability was unquestionably the enhanced green infrastructure of Lea Valley that involving the construction of the Olympic Park, which has helped to combat the effects of climate change such as urban heat islands as well as to promote biodiversity. Besides, the sustainability plan illustrated different fields of the program and the corresponding action on the five sustainability issues; the Figure 7 takes as an example the actions related to the field of architecture and urban planning which is one of the objectives of this analysis. The intent will be to examine mainly the issues of climate change, waste and biodiversity since inclusion and healthy themes life seem to be linked as a side effect of previous actions.

Programme element	Climate change	Waste	Biodiversity	Inclusion	Healthy living
Architecture and urban design	Environmentally efficient and climate-proofed design and construction		Creation of new habitats on and around buildings	Using architecture and urban design to create inclusive places that boost cohesion and regeneration	

Figure 7. Cross-cutting action on sustainability (Source: LOCOG, 2007).

Climate Change

According to the Sustainability Plan, London 2012's Olympiad tried to mirror the Kyoto Protocol implementation period; throughout this period global attention sharpen its focus on climate change issues and for this reason, the Olympic Games was the first to contribute to raising awareness and changing public attitudes locally, within the UK and internationally.
The strategic intent was directly linked to two challenges regarding one of mitigation and adaptation: to minimise the demands on fossil fuel-derived energy and materials, and in the meanwhile to ensure that buildings and lifestyles are capable of coping with the impacts of climate change. Furthermore, measures to reduce water use, as the consequences of

climate change are likely to include lacks freshwater. Other consequences include an elevated threat of flooding from rising sea levels and more intense and unseasonal rainfall. The measures proposed to also perform the Transport Plan for the London 2012 Olympic and Paralympic Games, through transport has relevance to the inclusion and healthy living. Moreover, the decision to locate the Olympic Park site near a major national and international public transport hub in east London has provided the opportunity to develop and implement many low-carbon choices, such as:

- to prevent ticket holders (except disabled people for whom public transport is inaccessible) from using private cars to get to places.
- create the Masterplan for the Olympic Park keeping in mind the legacy, highlighting which buildings have been maintained, which have been changed and which have been demolished, minimizing the cost of carbon for extensive demolitions and conversions after the games.
- the Masterplan was based on the concept of "Compact Games", identifying many places within walking distance of the Olympic Village, thus reducing fuel consumption and the impact on traffic during the Games and dependence on inherited cars.
- the ODA[3] procurement strategy stressed the need to examine costs over the life of construction projects. This includes all the costs of a building, including running and decommissioning and therefore promotes more energy-efficient design and procurement of materials.

Furthermore, the design of the Olympic Park was conceived to minimize water consumption and carbon emissions, as well as the impacts of climate change by:

- the design of the buildings to maximize natural light and ventilation and to minimize the need for heating and other energy uses.
- the construction of a combined heating and heating system (CCHP) as part of an on-site energy centre, which will allow for a much more efficient distribution of electricity, as well as recycling the heat created during the generation process.
- the construction of a wind turbine 120 meters north of the Olympic Park site.
- the creation of a park cultivated with species able to cope with climate change, while providing vegetation, shade and landscape to improve local microclimates.

Water scarcity and flood risk are also tackled through the creation of a park able to cope with flood events one in 100 years (moving to one in 1,000 for the elements at higher risk,

[3] The Olympic Delivery Authority (ODA) is responsible for building the new venues and infrastructure for the Games and ensuring that they have a viable legacy use.

such as the burial of power lines) as well as with increasing frequency excessively heavy episodes of rain (through efficient flood storage and drainage systems). The plan indicates the pursuit of the objective of reducing the demand for drinking water by 40% in new permanent locations based on an analysis of the industry-standard practice of 2006. In connection with this objective, there is another related one, concerning the residential development (i.e. the Olympic Village) with the initial aim of a 20% reduction compared to the average use of London. These measures on paper could allow Olympic Park to reach high environmental performance standards.

Waste

As with climate change, waste is closely linked to other elements of sustainability. Apart from the climatic impacts mentioned above, waste disposal methods can threaten both biodiversity and human health; the reuse of wood and other materials within the Olympic Park reduced the impact of construction on local communities and biodiversity. Also, a reasonable approach to food packaging assisted in the design and subsequent management of waste.

The planning and initial works of the Olympic Park site included pre-demolition remediation procedures, identification of waste management, reuse and recycling of demolition materials following the 90% target, as well as the renovation of the Olympic Park, significantly reducing the amount of land that needs to be transferred offsite.

The priority areas identified by the Plan for action on waste included:

– minimising waste during construction, operation, and demolition/conversion of both temporary and permanent venues.

– designing and building Olympic, Paralympic and legacy facilities to operate in a manner that is as waste-efficient as possible.

– ensuring that the Games themselves honour the ‘zero waste to landfill’ commitment made during the London 2012 bid; and using public education and outreach activity to promote low waste lifestyles.

In this sense, the London Olympic Games Organising Committee (LOCOG) engaged in businesses with suppliers and licensees who were best placed to deliver outstanding value for money while ensuring sustainability. This meant that London 2012 organisers engaged in business with responsible suppliers and licensees who were committed to the Sustainable Sourcing Code, achieved in 2011. For the first time, an independent commission was

established to monitor and publicly evaluate sustainability efforts. The code was based upon the following four principles:

- Responsible sourcing - ensuring that products and services are sourced and produced under a set of internationally acceptable environmental, social and ethical guidelines and standards.
- Use of secondary materials - maximising the use of materials with reused and recycled content, minimising packaging and designing products that can either be reused or recycled.
- Minimising embodied impacts - maximising resource and energy efficiency in the manufacturing and supply process to minimise environmental impacts.
- Healthy materials - ensuring that appropriate substances and materials are used to protect human health and the environment (LOCOG, 2007).

Biodiversity

Biodiversity is essential not only to the global economy but serving a vital function in climate change mitigation, watershed management, provision of sustainable natural resources and enhancing the quality of human life. London 2012 committed to ensuring that the Games play their part, through direct enhancements to the ecology of the Lower Lea Valley and other sites, by taking a responsible attitude to the management of natural resources and through promoting the value of the natural environment throughout the UK and international sports sectors (LOCOG, 2007).

Hence, the Plan defines key areas for action on biodiversity as following:

– minimising and mitigating the impact of development activity in the run-up to 2012.
– developing new and enhanced water and land habitats within the Lower Lea Valley, from open water and wetlands to species-rich grasslands.
– a conservation management programme for habitats and species detailed in Olympic Park Biodiversity Action Plan.
– protecting sensitive habitats and species at other competition sites, through the development of venue environment management plans; and promoting awareness of the value of biodiversity and its links to sport and healthy living.

As underlined by the Plan, most of these actions have been taken in the Lower Lea Valley complex in degraded areas of London. While rivers and other streams include valuable habitats, there was also significant ecological contamination by invasive plants such as the

Japanese knot. The Olympic Park Masterplan integrated environmental improvement from the outset by creating 110 hectares of new open spaces, in an area previously free of green spaces. The Masterplan foresees new habitats, including wetlands, open banks and prairies. These aim to provide an improved environment for biodiversity, as well as to improve flood storage within the valley. London 2012, as part of its preparatory work on the Olympic Park site, commenced investigations and transfers of species; these include the project to collect seeds of native plants to safeguard the key species before the reclamation of the site, investigations on tritons and reptiles and translocations to local sites, capture and translocation of fish, creation of artificial nests of kingfisher and sand hammer along the Lower Lea Valley and surveys to check for black redstarts and bats.

London 2012's aimed to improve and minimize biodiversity disruption is to collaborate with all parts of the construction program and detailed ecological management plans. This necessitates additional specific commitments concerning the protection and improvement of on-site wildlife including:

- to emphasize ecological continuity by providing natural links along the River Valley corridor and with the "green grid" (a network of open spaces across East London).
- preserving key habitats: for example, the walls of protective trunks will be built in the Bully Point nature reserve (using as many trees as possible during the site authorization), creating themselves a new habitat for amphibians, reptiles, invertebrates and plants.
- Eliminate invasive species, such as Japanese ornament and giant hogweed.
- use timber for construction from legal and sustainable sources in line with government policy.
- look for opportunities to integrate habitats into the design of buildings through the supply of nesting cavities and the creation of green and brown roofs (which are also useful tools for climate adaptation by slowing the runoff).

By doing so, the park will help the entire site to adapt better to climate change, thanks to its ability to cope with heavy rain events and providing vegetation to provide shade and combat the effects of the "heat island". Furthermore, better access and contact with nature will be achieved by the river restoration program and, ultimately, by the creation of the Legacy Park.

During the 2012 Games themselves, attention to biodiversity was maintained through specific environmental management plans for each site (inside and outside the Olympic Park). These indicate:

- an assessment of the conservation needs of protected and threatened species and habitats;

- measures to avoid damage to sensitive habitats and species, through fencing, signing, management arrangements, the layout of premises and lighting and post-Games restoration work where necessary.

Other considerations on biodiversity in the planning and operation of the Games include the search for natural materials for the "appearance of the Games" and the identification of opportunities for the procurement of home grew plants and the cutting of flowers for ceremonies.

Beyond a purely site-based approach, London 2012 promotes the establishment of a working group called London 2012 Biodiversity Group which developed a precise biodiversity strategy. This strategy includes a portfolio of projects with a global focus and local, introduced campaigns to increase the profile of endangered species or the role of biodiversity in sport, as well as demonstration projects on issues such as the restoration of urban rivers or community forests.

3.2.3. The governance of the plan

At the date of 18 October 2007, London 2012's vision was to leave a sustainable legacy for London and the UK. This vision and the strategic objectives for the Games were underpinned by the principles of 'sustainable development'. For achieving them, the LOCOG and the Olympic Delivery Authority (ODA), along with HM Government, Greater London Authority (GLA), British Olympic Association (BOA) and British Paralympic Association (BPA), were committed to operating together to maximise the economic, social, health, environmental and sporting benefits the Games bring to London and the UK.

The Olympic Board with the Boards of Stakeholder organisations ensured the delivery against these objectives through the following measures:

- Integrating sustainability principles into the day-to-day management of LOCOG and the ODA, working closely with the Host Boroughs, the GLA Group, nations and regions, central Government, BOA, BPA, sports authorities and the International Olympic Committee.
- Developing active partnerships with non-Governmental organisations, community groups, businesses, professional bodies and academia to help leverage the opportunities provided by the Games and to utilise the power of the Olympic brand to mobilise enthusiasm and maximise benefits.

- Procuring goods, services and sponsorship sustainably with an emphasis on supplier diversity, fair employment and environmental attributes, as well as other social and ethical criteria as appropriate.
- Establishing an independent assurance function to be overseen by the London Sustainable Development Commission in partnership with the National Sustainable Development Commission and equivalent regional structures (LOCOG, 2007).

Interestingly in the London Games, the institutional, or governance dimension, has been established as the fourth dimension of sustainable development alongside the social, environmental and economic. It sets more prominent emphasis on the social equity and participative aspects of delivery and the democratic and political processes for achieving this (Spangenberg, 2004). In this light, Girginov and Hills (2009) documented the political process of constructing sustainable Olympic sports development legacy, which is stressed in the Sustainability Plan, and pointed out that it is premised on three common assumptions – the creation of intersubjective meanings which go beyond individual beliefs, participation, and a mandate for action. In combination, these three assumptions have initiated the process of institutionalization of legacy so the institutionalized world of Olympic legacy creation can be experienced as an objective reality (Girginov, 2012).

Consequently, the Olympic legacy framework turned the idea of sustainable sports development into an enterprise rationalizing and legitimizing its main stakeholders, organizations concerned with monitoring and measuring the legacy and a myriad of delivery partners. The new institutional patterns, though, have been added to an already complex governance landscape of London, which Newman (2007) described as one of changing institutions and recurrent experiment. Newman's criticism concerns at the heart of sustainable governance as it challenges one of its main premises concerned with the human capacity to predict the future and to deal with uncertainties.

In this sense, Hardiman and Scott (2010) argued that 'the patterns of state activity associated with agency creation are rooted in a wider dynamic of expansion and differentiation of state activity'. They proposed a categorization of the modes of state action including developmental, regulatory, adjudicatory and moral advocacy, which were used to further unpack the emerging Olympic institutional legacy landscape and responsibilities. The developmental model of state action concerns generating and managing economic development; the regulatory involves the creation of public authoritative bodies to regulate areas of economic and social life, as well as delegating power to private organisations, who

under license can oversee professional activities with a public interest dimension to them; the adjudicatory function of the state deals with conflict resolution and grievances by resorting to law, and the moral advocacy involves both regulating personal morality and building a climate of moral values.

Using the above categories, Girginov and Hills (2008) identified 11 major international and national developers on the Olympic legacy scene. At the time of writing the Statutory Register, which is a comprehensive regulatory mechanism kept by the LOCOG, contains 127 organizations authorized to deal with the Games, of which nine are multinational companies, 26 domestic commercial companies, four licensees, three broadcasters and 85 non-commercial organizations. The UK government has further institutionalized and bureaucratized the legacy scene by establishing 11 government boards designed to develop different aspects of the 2012 legacy, thus further reinforcing the regulatory mode of state action.

Mode of state action	New UK agencies	Functional classification	Sector
Developmental	ODA	Delivery	Public
	HBSU	Delivery	Public
	LEST	Delivery	Public-private
	Legacy Trust	Funding	Voluntary
Regulatory	GOE	Regulatory	Public
	SLDB	Regulatory	Public-voluntary
	CSL	Advisory/consultative	Independent
Moral advocacy	Podium	Advisory/consultative	Public
Adjudicatory	N/A		

Table 3. New institutional examples of the modes of state action in Olympic legacy (Source: Girginov, 2012).

Table 3 shows the main agencies in each of the four categories of State action and their functions in relation to the Olympics. The strategic decision-making body with final responsibility for all Olympic matters, including inherited commitments from the past, is the Olympic Council. This is a public-volunteer-private body, comprising a temporary limited liability company, the LOCOG, two public bodies – the GLA and the government, and a voluntary actor, the BOA. State development action is carried out by a mix of public, private and charitable agencies, all initiated by the state. A public body, the ODA, has been charged with delivering the Games' infrastructural legacy, the LEST - a public-private partnership, with the aim of tackling London's labour shortage and improving the productivity of its

workforce, and a charitable organisation, the Legacy Trust, with the task of supporting sporting and cultural activities for all. As the regeneration of East London was one of the main concerns of the Games, a special Host Boroughs Strategic Unit (HBSU) was established to guide local regeneration efforts. The high public stakes at the Olympics required that regulatory action be assigned to a Government Olympic and Paralympic Executive (GOE) committee with ministerial responsibilities. Its mandate is mainly regulatory, ensuring public control over budgetary issues and implementation. The GOE is also closely involved with the Sport Legacy Delivery Board, which is composed of senior representatives of 17 public and voluntary organisations, including eight government departments and agencies. However, it is not clear how effectively this body has performed its role since it met only twice in five years - once to set its mandate and the second time without the Minister, its President (Moynihan, 2010). The role of 'critical friend' regarding the sustainable dimension of the Games has been entrusted to an independent Sustainable London Commission (CSL). Its function is to ensure that every aspect of the planning and implementation of the Games complies with the principles of sustainability (Figure 8).

Finally, moral advocacy was manifested through the creation of Podium, a public continuing and higher education unit for the Games. Podium's role is to mobilize support and encourage public engagement within the educational sector. This objective is to be achieved primarily through the creation of networks of institutions and groups to attract resources and maximize effects. Public participation is a central principle of sustainability, as supported by the Melbourne Principles for Sustainable Cities and Towns (UNEP, 2002). The explicit function of the podium has been to provide the central, but also the most elusive, function of the Games to inspire young people. However, as the Podium is funded by the Higher Education Council of England, it has no bearing on the rest of the UK. There are no new organisations specifically designed to take legal action. Olympic property in the UK is protected by the Olympic and Paralympic Games Act (2006) and all trade and promotional associations with the Games have been controlled by LOCOG and BOA. However, the Public Service Agreement (PSA) framework authorised Sport England and UK Sport to penalise the National Governing Bodies of Sport (NGB) for failing to meet their delivery targets by withdrawing funding. Although the UK Government allowed the involvement of private and charitable actors, the predominant mode of political governance of the Olympic legacy was hierarchical and top-down, including legal and administrative sanctions. The responsibility function in relation to sustainability was delegated to the CSL, which was funded by those who were to oversee (Girginov, 2012).

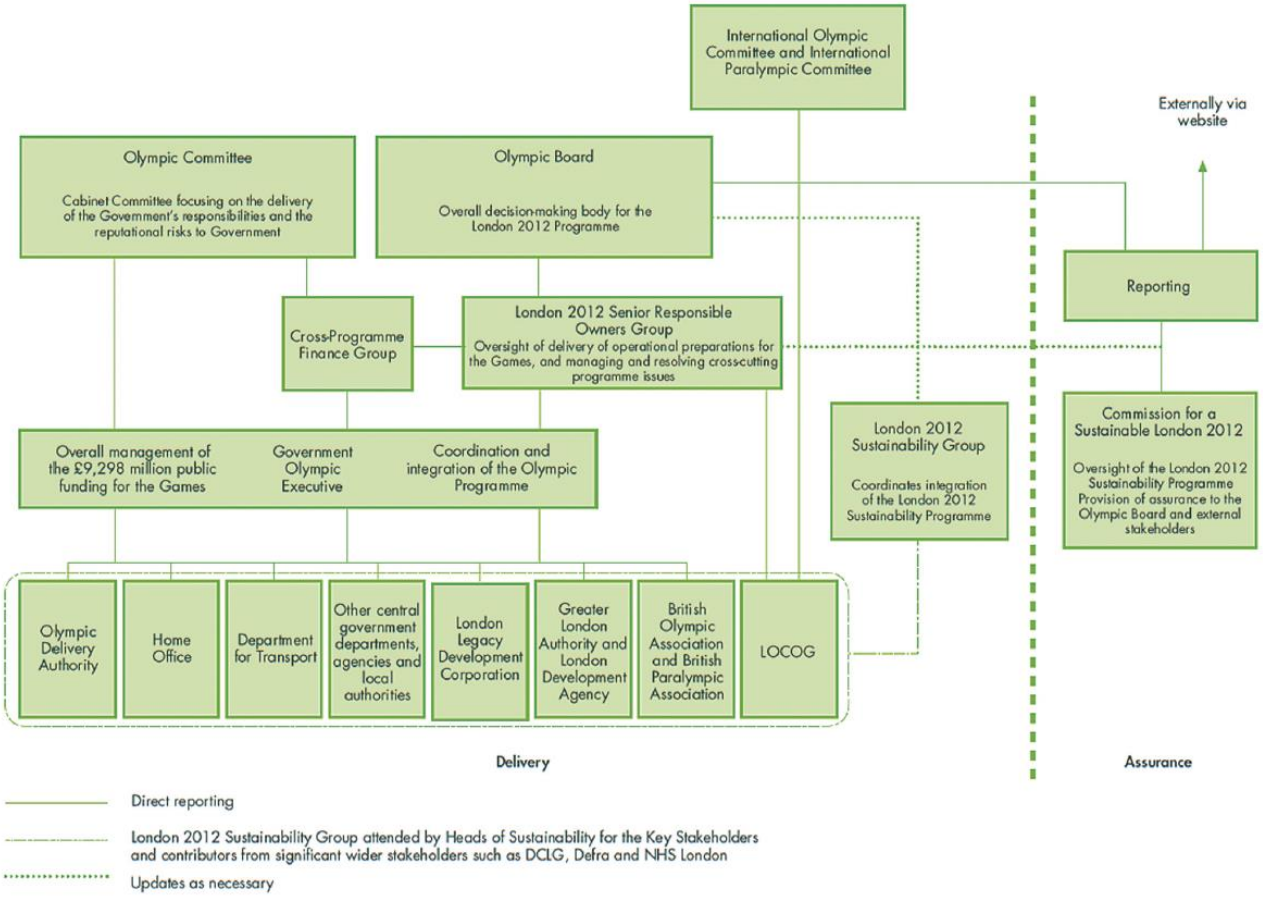

Figure 8. London 2012 Governance (Source: CSL, 2012b).

3.2.4. Tools implemented

It is clear that London has bid to host the Games in order to use the mega event as a tool for urban regeneration of the Lower Lea Valley, a brownfield land in East London characterized by social, environmental and economic deprivation, but with a strong strategic value. In fact, this area is located along one of the national development corridors, the Thames Gateway, a large-scale urban regeneration project which aims to revitalize this 'region' through the building of residences, services, infrastructures and investments. This project is embedded in a strength strategic framework (more specifically the London Plan of 2004); in this perspective, it is possible to affirm that the mega-event represents a "policy-window" which can linked the planning policies of four municipalities within the area with other relevant investments, independent from Olympic Games, "slowed down" by the economic crisis (Basso, 2017). In addition, within the Thames Gateway, the Olympic site is integrated in others urban regeneration programs with high environmental value: the East

London Green Grid (ELGG) and the Green Enterprise District. The ELGG aims to enhance the network of multifunctional open spaces as a link between urban centres, transport hubs and peri-urban areas, pursuing benefits in terms of mobility improvement, mitigation of climate change effects and preservation of biodiversity and cultural heritage (Quaglia, 2015). Furthermore, the ELGG brings strategic coordination and promotion together with local action to deliver and manage new green spaces. Therefore, it possible to affirm that the programme has a non-statutory character but must be taken into account as a material planning consideration (London Plan, 2008). The Green Enterprise District, on the other hand, is a strategy aimed at developing a low-carbon economy in East London by investing in renewable energy, the reuse of waste for energy production and the development of alternative fuels. Drawing on large-scale investments, the District aimed to become an international hub for low-carbon business and projects: generating energy from new sources, distributing energy more efficiently and using waste as a resource (LDA, 2010).
Four themes were created as following: attracting green enterprise to East London, decarbonising enterprise and stimulating demand, positioning the District at the forefront of low carbon innovation and maximising the potential of green and open spaces and the District's waterways.

Figure 9. Olympic Park Legacy Masterplan localised in the Lower Lea Valley (Source: Design Council).

At the urban scale, the Olympic plan is part of the strategic vision of the London Plan to develop a polycentric and resilient metropolis, in which the regeneration of brownfield sites, the strengthening of public transport and enhancement of blue and green infrastructure are the priorities, in line with the compact city and zero consumption of land model inspired by the national urban reform law of 2004, the Planning and Compulsory Purchase Act (Quaglia, 2015). Three master plans were required: one governing games-time requirements; one for the immediate transformation after the games; and one for the longer-term development of the land in the 20 or so years beyond the games. The games-time schemes also had to be capable of immediate adaptation into construction design and delivery quicker than any typical market cycle. The principal tools used to guide all designers, planners, engineers, contractors, and operators were the Olympic, Paralympic and legacy-transformation master plans that obtained planning permission in September 2007. Between June 2006 and spring 2007, several further refinements were made to the Olympic, Paralympic and legacy transformation master plans, in particular, to enhance legacy benefits further, adopt more sustainable approaches and improve deliverability. The commitment to be the greenest games ever drove the approach to sustainability and resulted in the introduction of renewable energy initiatives – including photovoltaic arrays on the Media Centre building in the north of the Olympic Park and revised proposals for the Energy Centre, incorporating combined cooling, heating and power and biomass boilers at Kings Yard. The revised master plan proposals also refined the game's infrastructure, including bridges and land bridges, to provide the best solution to sustain legacy development and minimise transformation required to deliver a more efficient master plan. Two planning applications were submitted by ODA in February 2007, covering:

- site preparation for the Olympic Park site, comprising earthworks, remediation of land, works to river walls, highways and utilities;
- Olympic facilities and legacy transformation for development of Olympic and Paralympic facilities, including venues and related facilities, bridges and other infrastructure, parkland and their transformation to the postgame legacy.

They were granted planning permission in September 2007 and formed the basis for all subsequent design and implementation. The planning applications were supported by an environmental statement which set out the main environmental effects from the construction, games and transformation of the site. While establishing some definitive future building lines, green space and urban street patterns, the planning applications also created a very flexible

framework for architectural expression by not seeking to define or overly constrain the form of any buildings at this early stage (ICE, 2011).

Figure 10. Master plans for games-time in 2012 (a), transformation in May 2013 (b) and legacy framework under development by the Olympic Park Legacy Company (c) (Source: ICE, 2011).

Figure 10 reveals the master plans for games-times and legacy transformation in 2013. The master plans were developed not just as planning documents but as delivery tools for use by succeeding designers, contractors and operators. To perform this function, they needed to give all users a precise direction on the parameters and objectives for the project while also creating the opportunity for designers

and engineers to express the creativity required to match the architectural expectations raised by the bid imagery, within the timescale and budget pressures.

ODA, therefore, published a design strategy and a sustainable development strategy in 2007. These helped to codify the core sustainability principles included in the master plans into a suite of high-level objectives and outputs designed to maximise long-term benefits of investment in the Olympic Park. At their heart was the main objective of ensuring that the achievement of a positive long-term legacy of the games was attained. By prioritising this objective, ODA ensured that all future design decisions were always examined and tested for their contribution to this aim. The key outcomes from the approach included the following:

- Designing the reclamation programme and site-specific remediation strategies around the long-term legacy use of the Olympic Park and not just games-time requirements.

- Building temporary structures and infrastructure that could be relocated to areas of need across the UK or which could be recycled where there was no clear long-term local need for a facility and/or no appropriate existing venue that could be used.
- Developing an Olympic Village which could be readily converted into new housing including affordable housing as part of the first stage of the transformation of the Olympic Park. Beds created for approximately 17 000 athletes will be converted to over 2800 homes.
- Creating new 'stitches' in the urban fabric that connected existing neighbourhoods into the Olympic Park postgame by extending the landscape to and across new bridges at the edge of the park into existing communities.
- Renewing 3 - 5 km of waterways and creating a new 102 ha park (metropolitan open land) to contribute socioeconomic benefits, for example by lowering the risk of flood, improving air quality and soundscape and providing recreational and amenity value.
- Renovating primary service infrastructure for water, energy, sewage and waste, and burying high-voltage power lines that blighted the area.
- Upgrading, extending and investing in new public transport infrastructure that would make Stratford one of the most accessible locations in London.
- Enhancing cycling and walking routes and facilities to and around the Olympic Park, including constructing new bridges to link the park with surrounding communities.
- Providing all the elements that will allow the Olympic Park's development to be transformed into a neighbourhood, properly integrated into the fabric of Stratford and east London.
- Grouping sports venues to create opportunities for shared use of back and front-of-house support facilities, thus minimising land take and maximising open space within the Olympic Park for visitors.
- Only building permanent venues where clear legacy needs were identified, and sporting and business plans developed for their use after the games. This thinking lay behind the plans to design: an 80 000 seat stadium that could be converted and retained as a 25 000 seater multipurpose venue; an Aquatics Centre that would house 17 500 spectators during the games but has a legacy capacity for 3500 spectators; a world-class Velo Park with a velodrome at its centre; a multi-purpose indoor sports centre and a Hockey Centre all capable of holding international events (ICE, 2011).

The existing plans for the Lower Lea Valley have eased the task of London to use the event to boost and extend the regeneration process that were already underway in East London

and also, the integration of the Olympic plan with the ordinary planning system show a strong will to extend the Games' effects in the long-term through a legacy-oriented approach (Smith, 2013). On the other hand, the redevelopment of the Stratford neighbourhood, around which the entire Olympic project revolved, has returned to London an important part of the city in a widely renewed but perhaps too private version, in the social sense of those who live there today, and privatized with the strong imprint of the construction and real estate companies committed to attracting wealthier than average segments of the population (Basso, 2017).

3.2.5. Monitoring mechanisms

Legacy outcomes at national and London levels were expressed by the government in June 2007 and by the Mayor of London in January 2008. A specific legacy promise for the disabled community was added in December 2009. In 2010, the newly installed Coalition Government reworked the legacy promises into a legacy programme comprising four strands (Table 4), which include the Big Society agenda (community participation) and which makes reference to economic growth and regeneration rather than sustainable development. In itself, this is part of a significant trend that sees sustainability confined to key official documents rather than openly promulgated (Gold & Gold, 2015). These statements are evidence that a clear monitor programme was not adopted caused also by the continuous fluctuation of the legacy promises.

When London decided to bid for the 2012 Games a key decision was made to centre the bid in East London, a relatively poor area, and not West London, a relatively prosperous one. This was based on the idea of using the Games to stimulate regeneration in a similar model to Barcelona and to create a sustainable legacy. The mantra "the most sustainable Games ever" was developed as a key aspect of the bid leading to an environment committee being formed to steer the bid and ahead of sustainability being recruited into the bid team. If Barcelona was the model for legacy, Sydney was the model for the "green Games". A combination of these two models, updated for 2012 provided the inspiration for a sustainable London 2012. The original sustainability targets for the bid were developed in consultation with the London Sustainable Development Commission (LSDC), WWF and Bioregional. Based on advice from these groups a decision was made to create a commission to independently assure sustainability called independent Commission for Sustainable London

2012 (CSL). This commitment was made as part of the bid. The primary objective was to protect against any notions of “Greenwash”. The CSL was created in January 2007 to monitor sustainability plans and evaluate the progress of the various bodies responsible for staging the Games and supervising subsequent legacy use. For this purpose, the Commission has published annual reports and thematic reports evaluating progress. It has also defined 11 sustainable legacy expectations for the Olympics, with considerable emphasis on socially sustainable legacies:

- A better standard of living for Londoners in the host boroughs;
- Quality affordable housing;
- An increase in the skills base of people living and working in the UK;
- A culturally diverse society that engages positively in work, community and in cultural institutions;
- People adopting healthier ways of living through sport and better lifestyle choices;
- Long term job prospects for Londoners and other UK residents;
- Disabled people able to freely access services, jobs, homes and community activities;
- Sites ready for future sustainable, low impact development;
- Residents adopting good environmental practices such as recycling and waste reduction;
- Minimal impact on climate change;
- Public spaces and facilities that are accessible, well used and maintained (CSL, 2012a).

Legacy promises, DCMS June 2007	*Legacy promises, London January 2008*	*Revised legacy promises, December 2010*
Making the UK a world-leading sporting nation Transforming the heart of East London Inspiring a new generation of young people to take part in volunteering, cultural and physical activity Making the Olympic Park a blueprint for sustainable living Demonstrating that the UK is a creative, inclusive and welcoming place to live in, visit and for business *December 2009* To bring about lasting change to the life experiences of disabled people	Increasing opportunities for Londoners to become involved in sport Ensuring Londoners benefit from new jobs, business and volunteering opportunities Transforming the heart of East London Delivering a sustainable Games and delivering sustainable communities Showcasing London as a diverse, inclusive, creative and welcoming city	Harnessing the United Kingdom's passion for sport to increase grass roots participation, particularly by young people – and to encourage the whole population to be more physically active Exploiting to the full the opportunities for economic growth offered by hosting the Games Promoting community engagement and achieving participation across all groups in society through the Games Ensuring that the Olympic Park can be developed after the Games as one of the principal drivers of regeneration in East London

Table 4. Evolution of the legacy promises (Source: Gold & Gold, 2015).

The Commission operated within an agreed assurance framework and a set of protocols; these were developed in 2005/06 and proved to be robust over the life of the Commission (CSL, 2012b). The assurance framework is illustrated below (Figure 11).

An independent evaluation of the Commission's work was commissioned in 2013 by CAG Consultants. London made a commitment to the International Olympic Committee (IOC) and the public to deliver the most 'sustainable Games ever'. CSL has played a significant role, along with many others, in enabling this to be achieved. The precise level of additionality produced by CSL is illogical to define retrospectively, particularly since there is no counterfactual against which it is can be compared to the programme.

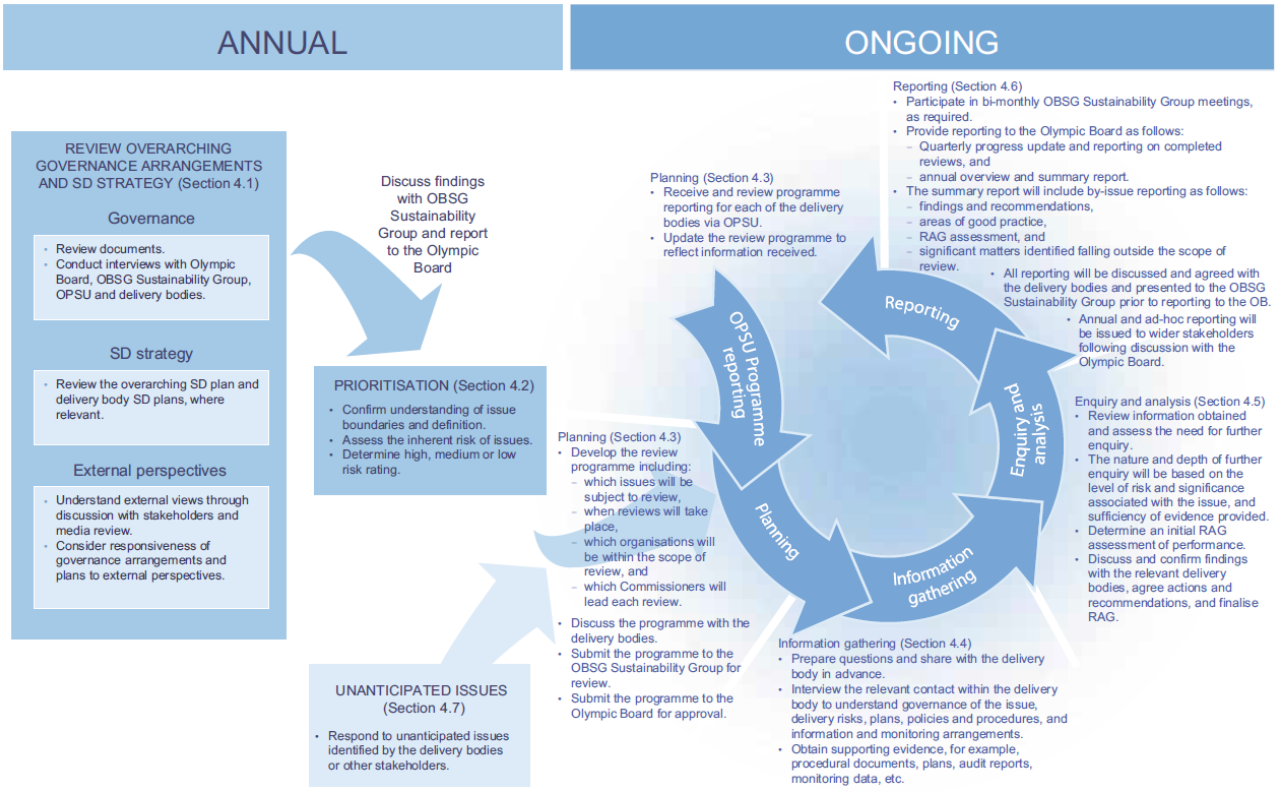

Figure 11. Framework of the CSL (Source: CSL, 2012b).

Still, the consensus amongst delivery body and other stakeholders contacted as part of this evaluation was that CSL added meaningful value to the London 2012 programme. This added value has several various dimensions:

- Sustainability outcomes. Through helping to embed sustainability within the governance and strategy for the programme, providing leverage to those within the delivery bodies who were seeking to deliver sustainability and through their advice and assurance activities, the evidence suggests that CSL had a significant impact on the sustainability of London 2012.

- Finance. Particularly in the context of the overall London 2012 budget, the direct costs of CSL were small. CSL appears to have punched well above their weight and many stakeholders feel that CSL represented excellent value for money. Whilst it is clear that engaging with CSL and following through on some of their recommendations led to expenses being incurred by the delivery bodies, whether these are considered to be additional costs or necessary costs depends, of course, on your view of the importance of the issues. Furthermore, the evidence highlights a few areas in which CSL may have generated significant cost savings for the delivery bodies.

- Governance. The secretariat highlighted several instances in which their programme-wide overview of London 2012 enabled them to identify issues that were at risk of falling between multiple organisations and not being effectively addressed. CSL also aided delivery by helping to broker solutions, particularly in relation to issues of importance to NGOs. By helping to manage the expectations and inputs of external stakeholders, CSL also enabled the delivery bodies to focus on delivery.
- Knowledge promotion. CSL has played a significant role in ensuring that the learning gained from London 2012 is recorded and shared, particularly through ensuring that the ODA and LOCOG's learning was captured. CSLs publications are also a unique body of work and therefore also an important part of the learning legacy of London 2012. Independent evaluation of the Commission for a Sustainable London 2012 57
- Managing the expectations of external stakeholders. CSL, and particularly CSL's Chair, developed trusted relationships with a wide range of external stakeholders. They were able to act as a buffer or broker between the external stakeholders (particularly the NGOs) and the delivery bodies and this role has been highly valued by the delivery bodies. The value added by CSL in terms of stakeholder relations was significantly heightened by their positive and open approach to communications, which appears to have contrasted with some of the delivery bodies.
- Credibility and reputation of the London 2012 programme. There is a wide agreement that CSL added very significant value to the credibility and reputation of the London 2012 programme. The fact that CSL gave the programme greater credibility from a sustainability perspective is seen by many to have been a key contributor to the absence, in the main, of negative coverage of the Games from a sustainability perspective (CAG, 2013).

3.2.6. The impact

Generally, LOGOC made environmental sustainability a top priority keeping permanent construction to a minimum and opting to use existing venues and temporary ones wherever possible (Horst, 2012). In situations where new venues were needed, as with the long discussed Olympic Park, building took place on reclaimed areas of contaminated industrial land with plans that minimised construction supplies and used lightweight steel and recycled materials. As underlined by the Post-Games Sustainability Report, it was estimated that more than 98% of the demolition waste was recycled and 62% of Games operational waste

was reused, recycled, or composted. Olympic structures were built to last, designing them to accommodate sports, entertainment, cultural and community events. Organisers developed 45 hectares of habitat, with a 10-year ecological management plan to encourage biodiversity. Moreover, approximately 300,000 plants were planted in the Olympic Park's wetlands area and over 1,000 new trees were planted in East London (IOC, 2013). Another achievement is related to the sustainability of mobility and was reached the 86 per cent of Olympic Park visitors travelled by rail. For all these reasons, some recognised the London 2012 Olympic Games as the 'greenest' Games up to that point in Olympic Games history. Perhaps one of the few areas that were neglected during these Games was the carbon footprint as London officials ended up dropping their attempt to offset carbon emissions. In this sense, and in spite of 400,000 tonnes of carbon dioxide equivalent saved (against reference footprint), a study projected the carbon footprint of the London 2012 Olympic Games estimated the Games produced around 3.4 million tons of carbon (Horst, 2012).

In December 2015, a complete Olympic Games Impact (OGI) study was carried out by University of East London with funding from the Economic and Social Research Council (ESRC) and overseen by the British Olympic Association. The OGI study was born from the IOC desire to develop an objective and scientific analysis of the impact of each edition of the Games. The study provides a record both individual nature of each Olympiad and its host context. OGI are mandatory and are carried out by an independent research team.

In this Post-Games Report are presented and analysed data on several indicators. The data are mostly quantitative secondary data (i.e. data that are already compiled by some government department or organisation), except for some data specific to the Olympic construction and operation which have been collected by ODA and LOCOG. For all indicators we have striven to construct a time series from 2003 to the present.

In total 67 indicators (15 environmental, 27 socio-cultural, 25 economic) have been studied in detail. Some of these indicators, such as So09 Health (Table 7) are themselves baskets of indicators on different aspects and measures of health.

According to the legend and to the overall result below presented, it is possible to affirm that the sustainability analysis shows that three years into legacy, on key sustainability measures, the results are after all positive (UEL, 2015).

Relevance The considered degree to which the data informs the causality of a Games effect vis-à-vis legacy promises.	H	High
	M	Medium
	L	Low
Rating The level of impact that is judged to have taken place over the data period, given relevant context.	G	Green (positive impact)
	Y	Yellow (small or indeterminate impact)
	R	Red (negative impact)
Confidence The level of confidence with which the conclusions concerning impact can be derived from the data.	H	High
	M	Medium
	L	Low

Table 5. The impact of the indicators has been coded according to the above scheme (Source: UEL, 2015).

Code	Indicator Name	Impact		
		Relevance	Rating	Confidence
En03	Water Quality	H	Y	H
En04	Greenhouse Gas Emissions	M	Y	M
En05	Air Quality	M	Y	M
En06	Land-Use Changes	M	Y	M
En07 En22	Protected Areas Olympic Venues in Protected Sites	H	G	H
En10	Public Open-Air Leisure Areas	M	G	M
En11	Transport Networks	H	G	H
En18	Solid Waste Treatment	H	G	H
En20	Greenhouse Gas Emissions of the Games	H	Y	H
En21 En24	Olympic-Induced Land Use Changes Olympic-Induced Housing	H	G	H
En26	Capacity of Olympic and Paralympic Venues	H	G	H
En29	Olympic Induced Transport Infrastructure	H	G	H
En33	New Waste and Wastewater Treatment Facilities	H	G	H

Table 6. Environmental indicators (Source: UEL, 2015).

Code	Indicator Name	Impact		
		Relevance	Rating	Confidence
So06	Poverty and Social Exclusion	H	G	H
So07	Educational Level	H	Y	H
So08	Crime Rates	H	G	H
So09	Health	H	Y	H
So10	Nutrition	H	Y	H
So12	Sport and Physical Activities	H	Y	H
So13	School Sports	H	Y	H
So14	Available Sports Facilities	H	G	H
So16	Top-Level Sportsmen and Women	H	G	H
So18	World and Continental Championships	H	G	H
So19 So37	Results at Olympics and World Championships National Sport Development	H	G	H
So20	National Anti-Doping Controls	H	G	H
So25	Political Involvement in the Organisation of the Games	H	G	H
So27	Votes Connected with the Olympic Games	H	G	H
So28	Consultation with Specific Groups	H	G	H
So29	Opinion Polls	H	G	H
So30	Participation of Minorities in Olympic Games and Paralympic Games	H	G	H
So31	Homelessness, Low Rent Market and Affordable Housing	H	Y	H
So32	Olympic Educational Activities	H	G	H
So34	Cultural Programme	H	G	H
So38	Volunteers	H	G	H
So39 So40	Spectators Attending events – affordable Games	H	G	H
So44	Perceptions about People with Disabilities in Society	H	Y	H
So45	Support Network for People With Disabilities	M	Y	H
So48	Accessibility of Public Services	H	G	H

Table 7. Socio-cultural indicators (Source: UEL, 2015).

Code	Indicator Name	Impact		
		Relevance	Rating	Confidence
Ec01	Employment by Economic Activity	M	G	H
Ec02	Employment Indicators	H	Y	H
Ec03	Size of Companies	H	G	H
Ec06	Public Transport	H	G	H
Ec07	Accommodation Infrastructure	H	G	H
Ec08	Accommodation Occupancy Rate	M	Y	H
Ec09	Tourist Nights	M	Y	H
Ec10	Airport Traffic	M	Y	H
Ec12	Hosting International Events	H	G	H
Ec17	Hotel Price Index	M	Y	H
Ec18	Real Estate Market	H	Y	H
Ec22	Foreign Direct Investment	M	Y	H
Ec24	Structure of Public Spending	H	G	H
Ec26	Public Debt	M	G	H
Ec27	Jobs Created in Olympic and Context Activities	H	G	H
Ec30	Size and QM of Contracted Companies	H	G	M
Ec33	Structure of OCOG Revenues	H	G	H
Ec34	Structure of OCOG Expenditure	H	G	H
Ec35 Ec38	Total Operating Expenditure (Olympic activities) Total Wages Paid (Olympic activities)	M	G	H
Ec36	Total Capital Expenditure (Olympic activities)	H	G	H
Ec37	Total Capital Expenditure (context activities)	H	G	H
Ec41 Ec42	Public share of expenditure (Olympic activities) Public share of expenditure (context activities)	H	G	H
Ec44	Employability of People with Disabilities	H	G	H

Table 8. Economic indicators (Source: UEL, 2015).

3.3. Rio de Janeiro 2016

3.3.1. The discourse of the plan

The 2016 Rio de Janeiro Olympics were based, according to the Sustainability Report, on the three pillars of sustainability "planet, people and prosperity". The mission was to "create excellent Games, with memorable celebrations that enhance Brazil's global image and promote sustainable social and urban transformations through sport, contributing to the growth of the Olympic and Paralympic Movement".

The Rio 2016 partners established a sustainability strategy at the Games level, which is consolidated in the Sustainability Management Plan (SMP). It was based on tender commitments, best management practices from other organisational committees and contributions from sustainability experts and key partners and stakeholders.

The three strategic objectives were proposed as part of Rio's bid for the Olympic and Paralympic Games. They correspond to the principles of sustainable development ratified by the United Nations Conference on Environment and Development in Rio 1992 and are:

- Planet: reduction of the environmental impact of the Rio 2016 Games projects, leaving a reduced environmental footprint;
- People: planning and implementation of the Rio 2016 Games in an inclusive manner, offering access to all;
- Prosperity: contributing to the economic development of the State and the city of Rio de Janeiro; planning, managing and reporting projects related to the Games in a responsible and accountable manner.

The project is a driving force for sustainable social and urban transformation and promises to contribute to the growth of the Olympic and Paralympic Movement.

To achieve these sustainable transformations, the organisers of the Games are committed to making sustainability criteria an integral part of the Games' management cycle, from design and planning up to implementation, review and post-event activities. The principles guiding this integration are accountability, inclusion, integrity and transparency.

Therefore, the goal is not only to achieve levels of excellence in the delivery of the Games, but also to show leadership by setting new standards for sustainable event management across the country and region.

In addition, as it addresses the sustainability of a constantly evolving area with the development of new technologies and working methods, Rio 2016 was committed to continuous improvement, which included compliance with applicable Brazilian legislation and international conventions.
The Rio 2016 partners have established a sustainability strategy at the level of the Games, consolidated in the Sustainability Management Plan (SMP), the core of the sustainability framework, which also ensured the participation of other stakeholders (NGOs, private companies and scientific institutions). The Rio implementation document mentions the following about the objectives of the plan:

"The central objective of the SMP is to support the implementation of the Games and to create, with the commitment and integration of the Government, the means for a definitive transformation of the city. This coordinated plan will set a new standard for urban transformation and sustainability in South America and create the basis for the integration of sustainable events and environmental regeneration" (Rio 2016, 2013).

A survey of the initial set of impacts to be assessed useful to define SMP strategies and objectives was based on the following points:
- The Rio 2016 Candidate File;
- Sustainability management plans for the previous Olympics and Paralympics Games Organizing Committees;
- National and international sustainability norms and standards (ABNT NBR ISO 20121 for sustainability management at events and GRI Global Reporting Initiative, supplement for event organisers);
- National, state and local environmental legislation, and sustainability;
- Emerging problems in social networks and press related to the Games;
- Consultations with different operational areas of Rio 2016;
- Consultations with the heads of the public bodies involved in the organisation of the Games;
- Consultations with other customers of the Games.

3.3.2. Objectives and strategy

The SMP was intended to ensure that the Games were in line with the development priorities of the city and included strategic objectives (Figure 12) which are developed into nine action streams with specific objectives selected for each action stream (Figure 13).

Reduced environmental footprint	Transport and logistics Sustainable design and construction Environmental conservation and restoration Waste management
Games for all	Engagement and awareness Universal accessibility Diversity and inclusion
Accountability	Sustainable supply-chain Management and reporting

Figure 12. The three strategic objectives and the relative nine action field (Source: Rio 2016, 2013).

RIO 2016 SPECIFIC SUSTAINABILITY OBJECTIVES

OBJECTIVE
REDUCED ENVIRONMENTAL FOOTPRINT
To implement actions to reduce air pollution, including greenhouse gas (GHG) emissions
To rationalise and optimise logistics operations in the transport of people, materials and equipment
To implement criteria for the rational use of resources, efficiency and minimisation of environmental impacts
To minimise the impact on the ecosystems at the Olympic and Paralympic venues and their immediate surroundings
To manage solid waste with responsibility
To deliver a Sustainable Food Sourcing Programme which leaves a strong sustainable legacy for Brazil

Figure 13. The specific sustainability objectives in the environmental stream (Source: Rio 2016, 2013).

According to these strategic and specific objectives, the intent will be again to examine the environmental field which is divided into four sections: transport and logistics, sustainable design and construction, environmental conservation and restoration and waste management.

Transport and logistics

The transport strategy of the Games has been developed to ensure safe, fast and reliable public transport for all spectators and the workforce of the Games (Rio 2016, 2013). The concept of transporting spectators and the workforce via public transport is based on the acceleration of existing projects, creating a "high-performance transport ring", which includes a completely renewed railway system, an expanded metro/subway system and four new public transportation (BRT) lines. This network is integrated into different stations by connecting all areas of the Games with key areas of the city and transforming the urban environment. Because it was designed to take full advantage of existing projects, the "High-Performance Transport Ring" has significantly expanded and improved the city's transportation network, helping to provide Rio de Janeiro with a mass transit system compatible with the needs of the city. As pointed out by the SMP, by 2016 it was predicted that the use of high-capacity public transport systems (trains and subway/subway) would increase from 12% of total estimated trips to an estimated 60% (including trains, subway/subway, BRT and LRT transport). In addition to the legacy for the city, the elimination of the need to use private cars to reach the race sites has added the advantage of reducing carbon dioxide and other harmful emissions and reducing the negative impact on city traffic.

Sustainable design and construction

The SMP stressed the fact that some of the biggest challenges and opportunities for sustainability are directly related to the venues – their location, architectural design features, construction, operations during the Games and their post-Games use and maintenance. Even as the case of London, the main focus is on maximising the use of existing venues

together with detailed design and construction planning for new venues, and adhering to high environmental standards. All decisions regarding whether to build new venues have been guided by proven post-event demand criteria, as well as by environmental and financial criteria of permanent buildings compared to temporary buildings. On paper, the aim is to avoid the construction of underutilised and high maintenance cost facilities. As a result, among the 36 venues used during the 2016 Games, 16 already existed (half of these renovated), nine were temporary and 11 new and permanent venues constructed. The temporary venues were based on the concept of nomadic architecture, with modular buildings that can be disassembled and reused, processed and moved around, so as not to go to waste after the Games. Guidelines for sustainable design and construction of permanent venues, and temporary overlay (temporary facilities) were established, beginning with the Candidature File, to:

- Encourage more compact designs and obtain better performance from energy and materials.
- Prolong the useful life of materials and structures.
- Reuse, whenever possible, existing materials at construction sites and, wherever possible, use recycled or renewable sources.
- Replace materials harmful to health.
- Reduce carbon emissions embedded in buildings.
- Adopt technologies that enable the efficient and rational use of water.
- Use passive bioclimatic systems, improve energy efficiency, provide greater thermal/acoustic/lighting comfort and create healthier indoor environments that emit fewer pollutants.
- Maximise the use of renewable energy.
- Reduce the need for replacement and maintenance over the lifetime of the facilities.
- Minimise earth-moving activity.

Interestingly, all permanent venues built by the municipal government received Leadership in Energy and Environmental Design (LEED) certification and the energy economy seal from Brazil's National Electrical Energy Conservation Programme (PROCEL). Thus, these venues constructed by the state government received internationally recognised environmental certifications applicable in Brazil, in addition to the PROCEL energy economy seal. The federal, state and local levels of government, competent authorities and involved businesses also provided assurances that all construction projects for the organisation of

the Games would be made following local, state and federal environmental protection regulations. Specifically, construction projects were subjected to the resolutions of Brazil's National Environmental Council (CONAMA) and the Environmental Institute of the State of Rio de Janeiro (INEA), construction code and zoning laws of the city of Rio de Janeiro, as well as the rules of the Brazilian Association of Technical Standards (ABNT) and the National Institute of Metrology (INMETRO). International conventions, such as the Montreal Protocol, Basel Convention, Stockholm Convention and the Convention on Biological Diversity, were also be respected.

Particularly, the most important interventions are the renewal of the port district of Rio de Janeiro, a new walking infrastructure called Passeio Olímpico with new venues and buildings in Parque Carioca which is located the Olympic Park, urban redevelopment of the area surrounding João Havelange Olympic Stadium, urban improvements around the Maracanã Stadium, and new facilities in Parque Madureira.

Environmental conservation and restoration

For the 2016 Games, the new sports venue construction projects are not subject to the requirement to carry out a prior environmental impact study (per CONAMA Resolution No. 001 of January 23, 1986), with environmental licensing from the City of Rio de Janeiro's Department of the Environment (SMAC) it was sufficient.

However, studies to minimise environmental impacts were conducted for all the new facilities; these include a soil contamination assessment, species (fauna and flora) inventory, as well as hydro-geological and water quality and contamination studies. All projects had as a premise the aim of maximum preservation of existing patches of vegetation, minimising removal and transplantation, as well as the use of the species inventory, such that it could be used as a reference source for landscaping projects. The cultivation of native species was the basis of landscape projects to environmentally restore stretches of land that are currently degraded and/or deteriorated.

Waste management

The National Solid Waste Policy, the subject of Federal Law 12.305 of August 2010, calls for the shutting down of all large untreated dumpsites in Brazil by 2014 and substituting them

with sanitary landfills. The same law makes it mandatory for all municipalities to prepare a solid waste management plan that includes waste treatment and recycling.

The new Rio de Janeiro Waste Treatment Centre (CTR), located in Seropédica, is under the responsibility of the municipal government and has been built under modern sanitary and environmental engineering technologies. In June 2012, upon the shutdown of the Gramacho and Gericinó dump sites, the CTR began receiving 100 per cent of the solid waste generated in the city of Rio de Janeiro — some 9,000 tonnes per day. By 2016, the CTR will be supplemented with seven transfer stations, of which four (Jacarepaguá, Caju, Marechal Hermes and Santa Cruz) are already in operation. The environmental clean-up of Gramacho, which is the responsibility of the municipal government, is based on a system that will recover and process biogas, an initiative that was previously untried in Brazil; this involves purifying the biogas, bringing it up to the calorie level of natural gas, thus permitting its sale to Petrobras, to be used as a process gas in the Duque de Caxias refinery. This project is part of the Clean Development Mechanism established by the Kyoto Protocol, permitting the sale of carbon credits, with revenues to be shared between the concessionaire, COMLURB, and a growth fund for the Jardim Gramacho neighbourhood. Over the 15 - year term of the landfill exploitation concession contract, the concessionaire shall be responsible for maintaining the safety of the area; geotechnical and environmental monitoring; control of soil stability; guarding against leakage into adjacent, underground water tables; establishing embankments; and planting vegetation to cover the entire surface area. The shutdown of the operations at the Gramacho landfill represented an end to the only source of income for an estimated population of 1,700 waste pickers, who, over many years, had scavenged materials on the site that represented subsistence for them and their families. With the decommissioning of Gramacho, COMLURB deposited a single payment into a Waste Pickers Fund, which was scheduled for disbursement over a period of 15 years, distributed equally among the group of waste pickers registered on a list that was certified by their leaders. Finally, the environmental clean-up of 75 clandestine dumps located in the vicinity of Gramacho was under the responsibility of the state government, as is the environmental clean-up of a mangrove swamp in the neighbourhood, the construction of a security fence in the mangrove area and an asphalted bicycle path next to the fence (Rio 2016, 2013).

3.3.3. The governance of the plan

Rio 2016, the host city's OCOG, was a private organization that works as a bridge between the IOC and the public entities in Brazil that are responsible for performing the 2016 Olympic Games. To that end, Rio 2016 was responsible for the logistical and organizational planning and implementation of the Games. Indeed, it coordinated more than 100,000 people necessary to stage the event, including volunteers and suppliers. Rio 2016 also hosted communication between the IOC and the governmental entities like the Autoridade Pública Olímpica (APO) and Empresa Olímpica Municipal (EOM), which are presented below. To achieve its mission, Rio 2016 had both an internal and external governance structure, which established the role of both private and public entities in the execution of the Games. Inside, Rio 2016 was headed by a General Assembly that meets annually to set and manage the agenda for the Games. Beneath the General Assembly was an Executive Council that meets quarterly and was responsible for implementing the agenda set by the General Assembly. On an equal level of authority and autonomous from the Executive Council was an Audit Committee, which is responsible for the internal financial auditing of Rio 2016. The Audit Committee met monthly, but likely conducts on-going audits of Rio 2016's finances. Closer to the day-to-day operations of Rio 2016 was the Board of Directors, which meets monthly. This Board of Directors presided over a Sports Advisory Committee and Executive Management Team, which are outsides of Rio 2016's Articles of Association (Figure 14).

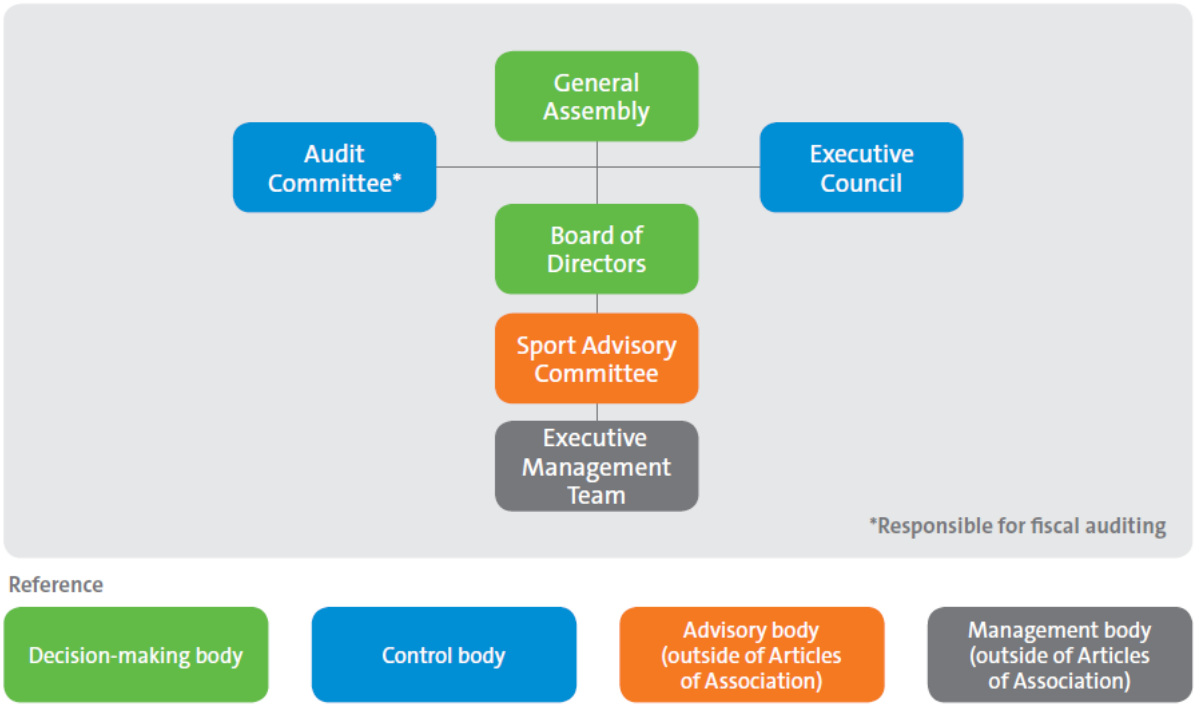

Figure 14. The governance framework of Rio 2016 (Source: Sustainability Report, 2014).

Externally, Rio 2016's governance structure contained four distinct groups, which were themselves comprised of representatives from the various stakeholders in the 2016 Games. These groups include a Steering Committee, Executive Committee, and Working Groups. The external governance worked where the collaboration between the Brazilian governmental entities, Rio 2016, and the IOC takes full effect. Each group had distinct responsibilities, but together, they acted towards the common goal of putting on the 2016 Olympics. The Steering Committee was tasked with ensuring that the strategic issues surrounding various Olympic projects, including those listed in the Responsibility Matrix, were properly addressed, and discussed. This committee was comprised of representatives from executive offices of the federal, state, and municipal governments; the Olympic Public Authority Executive Director and the CEO and COO of Rio 2016 (Figure 15). The operational structure of Rio 2016 is headed by the Executive Management Team, which is composed of the Chief Executive Officer, the Chief Operations Officer and the directors of the six executive departments: Finance, Engagement, Sports, Commercial, Operations and Infrastructure. The six executive departments are further divided into 56 functional areas, which are the equivalent of departments in other companies.

Furthermore, The CEO and the COO have overall responsibility on the sustainability programme. Sustainability is embedded into internal management systems.

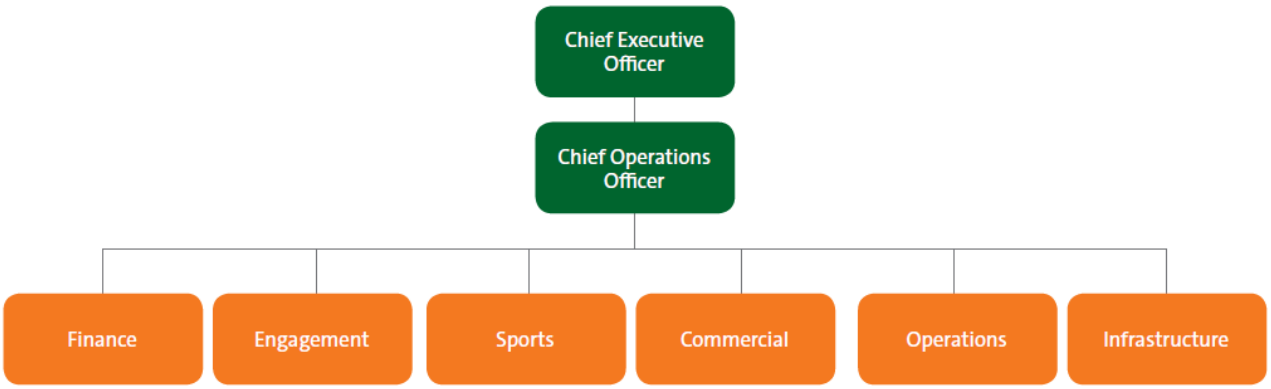

Figure 15. The CEO and COO and the six executive departments (Source: Sustainability Report, 2014).

The objectives enshrined in the Rio 2016 Sustainability Management Plan are delivered across the entire organisation. It means that the procurement and logistics teams are responsible for implementing the sustainable supply-chain programme.

In the same way, the food and beverage team is working to deliver the objectives related to healthy and responsibly sourced food, while the team of architects in the venues design

team is working to deliver low-carbon temporary structures. The cleaning and waste team is responsible for achieving the objectives related to recycling and waste management, and the designers of the Look of the Games team are leading the path to reduce waste generation. A core team of sustainability experts provides technical advice and routinely supports all the functional teams in the delivery of their sustainability outcomes.

As of December 2013, the team comprises a staff of eight full-time collaborators, headed by a senior employee. The core sustainability, accessibility and legacy team is part of the Planning Team, which reports to the Finance Executive Director (CFO), who in turn is a member of the Executive Management team (Figure 16).

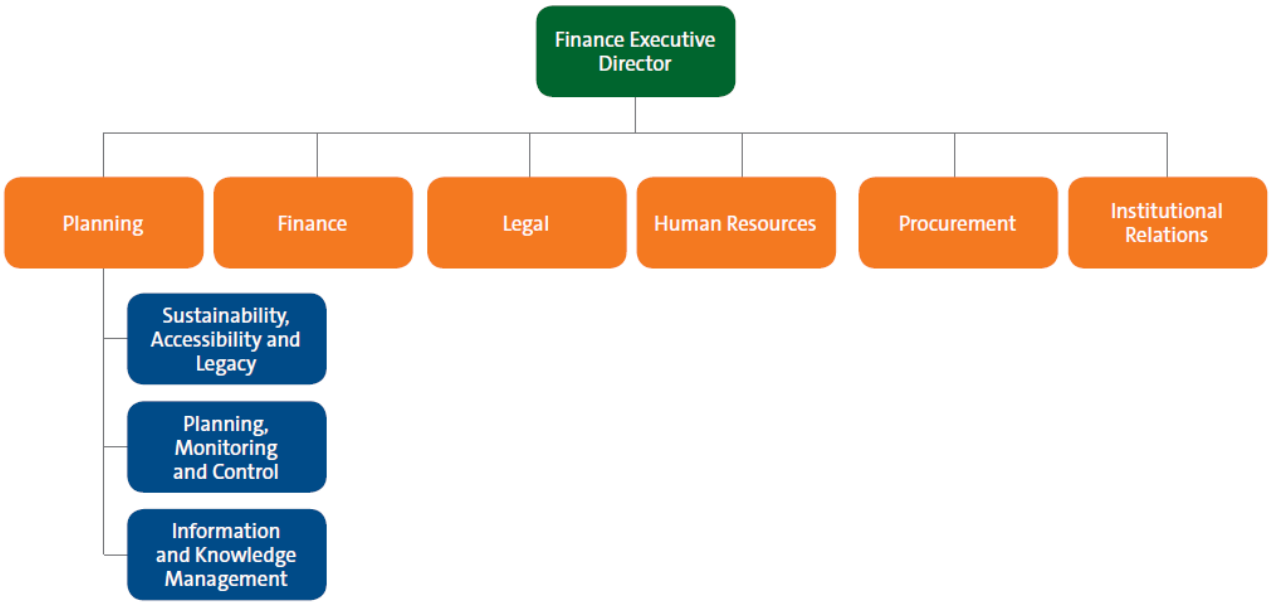

Figure 16. The governance framework of Rio 2016 (Source: Sustainability Report, 2014).

The Executive Committee met in conjunction with the Steering Committee. This committee was addressed with ensuring that the Steering Committee has been informed of the day-to-day progress of infrastructure projects and services provided for the games. In that role, the Executive Committee acted in a supervisory role over the various working groups. The Executive Committee was comprised of representatives from the federal, state, and municipal governments; the APO; and Rio 2016. Finally, the working groups made up the last stage of the external governance structure. These working groups were composed of representatives from Rio 2016 functional areas who worked directly with the various entities responsible for preparing the games. To that end, they engaged with all those involved to ensure compliance with the specifications for delivery of the games, as they are dictated by

the Games Council. Brazil's unique federalism required the creation of the APO – the primary Olympic public authority in Rio. The APO brought together the federal, state, and local governments in the planning of the Games. This was a unique body in Brazil — the first and only public body to bring all three levels of the government together — and was one of the strongest points of Rio's bids to host the Olympics. The organization allocated responsibilities and coordinates preparation for the Games among the many entities, public and private, that oversaw the construction, infrastructure, and revitalization projects taking place around Rio. These entities included the EOM and Rio 2016, as well as the participating offices of the federal and state governments. In its near-daily interactions with the IOC, the APO worked to ensure that all entities work together to meet Rio's obligations to the IOC. One of the most important aspects of the APO was its creation and maintenance of the Responsibility Matrix ("Matrix") [4]. The Matrix encompassed many of the "commitments made by government agencies viz-a-vis the staging and organization of the 2016 Rio Games." This Matrix was a dynamic document that is made publically available to provide a transparent explanation of the projects underway, the cost of those projects, and the project's status.

At the municipal level, the Empresa Olímpica Municipal ("EOM") oversaw completing many of the sports venues and infrastructure projects. Operating out of the Rio mayor's office, the EOM, along with the Municipal Secretary of Public Works, was responsible for the Olympic Park in Barra da Tijuca and the Deodoro Sports Complex. While primarily focused on the construction works necessary for the Games, the EOM also sought to improve Rio for the future through changes in transportation, urban infrastructure, environment, and social development and using the Games as a catalyst to launch significant public projects. Some of the so-called "legacy" projects included the Bus Rapid Transit line ("BRT"), light Rail Transit, and the revitalization of Rio's port region, as well as the Rio Operation Centre, which monitored the city and coordinates integrated responses to emergencies, and the Seropédica Waste Treatment Centre, which allowed for the closing of the environmentally harmful Gramacho landfill. These projects were completed in conjunction with the state and federal bodies (UR, 2016).

[4] The Responsibility Matrix is a document created and maintained by the Olympic Public Authority (APO) that details the responsibilities of each governmental entity involved in the Olympics.

3.3.4. Tools implemented

One of the main instruments that Rio practised to prepare its Olympic city is the adaptation of extrajudicial and supra legal mechanisms. Law 12.035 'The Olympic Act', established in 2009, was the main legislation that facilitated the conditions required for the execution of Rio's Olympic City, enabling a wide array of conditionalities. In particular, it intended to:

- regulate immigration rules;
- empower the Brazilian government to unilaterally interfere with public contracts regarding the production of the Games (specifically related to goods, property and equipment);
- temporarily suspend contracts with advertisers who utilize space in airports and other areas of interest to the Games (from July 5th to September 26th, 2012);
- control, monitor and repress illicit acts which infringe on the intellectual property of Olympics' insignia including that which occurs on the internet;
- reserve the necessary airwaves and frequency spectrum for the uninterrupted broadcasting of the Games;
- guarantee that any resulting fiscal deficit will be covered by the Organizing Committee;
- install the full application of the World Anti-Doping Agency code, as well as the Olympic and Paralympic Charter (Lei 12.035, 2009).

In addition to the Olympic Law, the APO was created by executive order and had extraordinary decision-making powers over processes that would typically flow through democratic channels. Even more extensive than the Olympic law was the 2011 World Cup law. Gaffney takes particular issue with Article 39 which states that "The three levels of government will, in collaboration with all competent authorities assure that, during the length of the competition any official event location, especially the stadiums, will be available for the exclusive use of FIFA." The 'Olympic family', including the international media and athletes, are also given access to private beaches and exclusive transportation lanes, furthering the process of isolation, privatization, and exclusion in Rio's mega-event preparations (Gaffney 2011).

Additionally, the urban master plan for the city of Rio de Janeiro (called Plano director) has been modified to include new building codes and zoning restrictions. In his speech to the IOC, Rio's Mayor Paes committed the city's urban form to the requirements of the Olympic

games: “The Games Master plan is the city’s master plan they are the same”. In Gaffney’s account, these reforms followed “unconstitutional processes, without public audiences, and have rezoned strategic parts of the city that have set off a series of real estate speculations without taking into account the people that live there already. Most of the targeted areas house poorer communities that are threatened with forced relocation to allowed real estate projects to move forward”. An example of this type of legislation was the PEU Vargen’s law, which passed in November 2009. According to Gaffney, the law supported the construction of high-rise condominiums in a region characterized by one and two-story houses by raising the building height codes; the policy was on the backburner until developers were able to use the “Olympic moment to push through a law that was prepared in anticipation of a moment of maximum distraction” (Gaffney 2011). The city also revised the *Plano director* to allow hotel construction in an area not beforehand zoned for hotels (Schissel, 2012).

Therefore, it is possible to argue that happened a poor implementation of a detailed sustainability plan, more precise than the London one. Another possible reason for this missing application can be found in the national urban legal framework and the relative standards and guidelines in the theme of sustainability. According to Brazilian City Statute drafted in 2001, it is explicit as a general guideline the guarantee of the right to sustainable cities understood as the right to urban land, housing, environmental sanitation, urban infrastructure, transportation and public services, work and leisure, for present and future generations. Such guidelines run the risk of remaining in the field of rhetoric if the law itself does not provide for planning and management instruments, especially when it comes to rites for their drafting and approval (Cities Alliance, 2017). Brazil does not establish a land classification, does not establish planning instruments at the national and subnational level, does not address the metropolitan theme (although the Metropolis Statute, Law 13.089/15, was approved in Brazil), and establishes the Master Plan (*Plano Director*) as the main instrument, which presents lack adequate regulatory instruments to guarantee their operationalization and consequently an effective promotion of urban transformation in the sense of overcoming the urban problems. Hence, the lack of suitable planning instruments contributes to negative on the overall resilience attribute of territorial governance and can boost exceptional practices that cannot help the implementation of sustainable actions.

3.3.5. Monitoring mechanisms

To ensure an appropriate level of supervision, timely updates on sustainability performance and next steps are provided to the internal and external governing bodies (Executive Management Team, Board of Directors, Executive Committee and Coordination Committee). Besides, Rio 2016 provided reports every six months for the IOC and the IPC on progress against plans. Rio 2016 has a corporate risk register in place, which identifies the likelihood and impact of risks occurring and the actions being taken to manage and minimise them. Risk assessments are updated regularly and reported to the Executive Management Team and the Board of Directors. The sustainability team ensures that significant sustainability-related risks and issues are identified and maintained as part of this process and that a precautionary approach is taken during the process.
Indeed, the Sustainability Report argues the following statements:

"*The Coordination Committee and the Executive Committee are supported by workgroups. The sustainability workgroup is responsible for developing and monitoring the implementation of the Sustainability Management Plan, and for providing timely updates on sustainability performance to the three higher committees. It is composed of sustainability experts from all levels of government, APO and Rio 2016*" (Rio 2016, 2014).

Moreover, in the SMP is presented some actions in detail regarding monitoring mechanisms which were under the responsibility of Rio municipality. To host the Rio 2016 Games, one of the commitments made by the federal, state and municipal governments was to improve air and water quality monitoring systems in the four Games zones. Agreed actions to date include:

- Under the auspices of the state government (INEA), to adapt and expand the air quality monitoring network, to continuously measure concentration levels of pollutants, especially those of inhalable particulates and ozone, as well as monitoring weather conditions in the Games zones.
- Implementation of a noise monitoring network. The state government (INEA) will contract a third-party service to monitor noise in the coverage areas of the Olympic venues, the infrastructure projects and from existing traffic patterns, which connect the Games locations.

- Monitoring water quality and implementing oceanographic monitoring of the coastal range. The state government (INEA) is responsible for the modernisation and expansion of monitoring system along the beaches in the areas of Zona Sul and Zona Oeste in the city of Rio de Janeiro, with an emphasis on the beaches of Copacabana, Leme and Flamengo, where Olympic competitions will be held. The APO will sign an agreement with the Brazilian Navy to monitor oceanographic data for the 2016 Games (Rio 2016, 2013).

1	**Sustainability Management Plan**	Games-wide[8]	• Three strategic objectives (based on bid commitments, local and global standards) • Nine action streams • Twenty-eight Games-wide specific objectives Formally signed off by the Coordination Committee in March 2013
2	**Corporate Sustainability Policy[9]**	Corporate[10]	• Establishes guidelines and principles required to ensure that good practices in sustainability are embedded into the full cycle of planning, staging and dissolution Formally signed off by the Executive Management Team in March 2014
3	**System for Integrated Delivery of Cross-Organisational Responsibility**	Corporate	• Master schedule[11] • Sustainability deliverables embedded by the Project Management Office (PMO) • Sustainability operating policies and procedures • Risk management tools
4	**Sustainability Management System**	Corporate	• Establishes guidelines and actions to facilitate delivery of Rio 2016's contribution to the Sustainability Management Plan • Facilitates compliance with ISO 20121 • Creates procedures and actions to operate sustainable Olympic and Paralympic Games in all of Rio 2016's activities, products and services • Establishes interacting elements that are used to institute policies and objectives, and the processes to achieve those objectives
5	**Feedback**	Games-wide	• From partners and external stakeholders
6	**Monitoring**	Games-wide	• Rio 2016 Executive Management Team, Board of Directors, Coordination Committee, Olympic Public Authority (APO)
7	**Pre-Games and Games-Time Operating Support**	Corporate	• Venue operating plans • Functional operating plans
8	**Assurance**	Corporate	• ISO 20121 certification
9	**Communications**	Games-wide	• Stories, website, presentations, stakeholders outreach

8 By Games-wide, we mean all projects, activities and services related to the Rio 2016 Olympic and Paralympic Games, delivered by any of the Games delivery partners.

9 Refer to Appendix C.

10 By corporate, we mean projects, activities and services under the responsibility and control of the Rio 2016 Organising Committee for the Olympic and Paralympic Games.

11 The Master Schedule is a management tool that allows a shared planning and monitoring platform between the IOC/IPC and Rio 2016 for the Games organisation.

Table 9. Rio 2016 sustainability management and reporting system (Source: Rio 2016, 2013).

The environmental clean-up of Gramacho, which is again the responsibility of the municipal government, is based on a system that is recovered and processed biogas, an initiative that was previously untried in Brazil; this involves purifying the biogas, bringing it up to the calorie level of natural gas, thus permitting its sale to Petrobras, to be used as a process gas in the Duque de Caxias refinery. This project is part of the Clean Development Mechanism established by the Kyoto Protocol, permitting the sale of carbon credits, with revenues to be shared between the concessionaire, COMLURB, and a growth fund for the Jardim Gramacho neighbourhood. Over the 15-year term of the landfill exploitation concession contract, the concessionaire shall be responsible for maintaining the safety of the area; geotechnical and environmental monitoring; control of soil stability; guarding against leakage into adjacent, underground water tables; establishing embankments; and planting vegetation to cover the entire surface area (Rio 2016, 2013).

3.3.6. The impact

As pointed out by the Post-Games Sustainability Report, one of the main targets was to hold an event with low greenhouse gas emissions: the objective was to reduce emissions under the control of Rio 2016 by 18.2 per cent in relation to the initial benchmark scenario calculated in 2014 and to offset all operational emissions, as well as a large portion of emissions associated with spectator travel. Moreover, was achieved an offset of 2.2 million tonnes of carbon dioxide equivalent, which is equivalent to all the operational emissions and 71 per cent of spectator-related emissions, thus achieving the established target. Despite the reductions achieved, it is possible to argue that the carbon footprint was substantial. Probably, the most positive results are linked to the waste target with 1,095 tonnes of recyclable waste sent to recycling plants and cooperatives.

Rio de Janeiro's ambition was also to redevelop portions of cities and give them back to the population, in what should have been Brazil's second settling blow, internationally, in the ideal one-two with the two-year World Cup before. But unlike London, the passage of the Olympic Games from the Brazilian city has resulted in almost nothing. Precisely, the drive of Rio was focused on the redevelopment of city areas and infrastructures, and on the realization of an eco-sustainable event. With a huge total investment, the good intentions

clashed with the corruption of local politics[5] and the economic difficulties of a country that was making an effort beyond its own possibility to organize something that, probably, he was unable to support. The plans to upgrade public transport to connect the favelas, and to improve the city's water purification system, were only partially implemented and with significant delays, and the same reuse plan for some plants was subsequently blocked by the lack of funds. Furthermore, other mismanagements of the event influenced the sustainability strategies in the sense of the social dimension. In the SMP, developed by the Municipality of Rio de Janeiro, the city government states that one of the strategic objectives of the municipal planning department was to “organise an all-inclusive Games, leaving the city’s population with a positive social balance” (Braathen et al., 2014). Relevant, in the negative sense, was the case of Vila Autódromo, a fishing village which developed into a working class neighbourhood in the upper middle class boomtown Barra de Tijuca in the Western zone, serves an example of the conflictual relationship between favela’s local residents and the government because of the upcoming mega events. It was threatened by collective relocation because of the construction of the Olympic Park (Figure 17).

Figure 17. Render view of the Rio’s Olympic Park (Source: Architecture firm AECOM).

[5] One of the main corruptions involved managers of the national oil company Petrobras and workers' party (PT) leaders, the latter to the government at the time of the facts.

The case exemplifies how that the sustainable strategies and the relative legacy effects promises of the mega-events that the constructors promote can be imposed at the expense of poor communities and residents which were located near the sports facilities and the main access roads. As regards, Vainer (2011) argues that the preparations for the mega-events have authorised, consolidated and legalised practices of legal exception to abide by the demands of private sponsors and the organising committees. The forms of illegality and exceptions to the institutional order have been multiplied, making Rio a city of permanent exception. Contracts and case by case negotiations have become more important than the law, and bargaining power has more weight than the application of the majority's decisions and the citizens' rights. Besides, in the bid process the government committed itself to improve air and water quality; however, a study conducted independently by Reuters analysing government data found that 'Rio de Janeiro's air was dirtier and deadlier than portrayed by authorities and the Olympic Games promised legacy of cleaner winds that has not remotely been met' (Brooks, 2016).

Despite these considerations, the Post-Games Sustainability Report Rio 2016 presents the results of the sustainable practices, highlighting the following achievements:

- 16,000 (state and private) schools participated in the education programme Transforma, which took new sports and teaching materials to the public-school network
- 83 per cent (by value) of the goods and services purchased were procured from Brazilian companies
- 44 hectares of native vegetation were planted on the golf course
- 7.3 hectares of natural vegetation were restored in the Olympic Park
- 49 hectares of green area were open to the local community for leisure, bringing benefits to 1.14 million people.
- the Future Arena will be disassembled and reused in the construction of four state schools across the city
- more than 60 per cent of public transport on high-capacity lines (compared to 18 per cent in 2009)
- 10 new sewage treatment plants and 2,100km of sewers in the west of Rio de Janeiro
- Over two million tonnes of CO2 offset in innovative projects that leave a low carbon legacy for important sectors of the Brazilian economy
- 100 per cent of the wooden furniture and fittings were of legal and sustainable origin

- for each R$1 (Brazilian real) invested in sports facilities, another R$5 were invested in legacy projects, which contributed towards improving the quality of life of the Rio de Janeiro population

- 33 recycling cooperatives participated in the Games waste management, recycling a total of x tonnes (Rio 2016, 2018).

Furthermore, sustainability key performance indicators are displayed in the Post-Games Sustainability Report; the general result, below reported, is undefined and difficult to read, due to some indicators which presented not possible quantification.

TRANSPORT AND LOGISTICS					
GENERAL OBJECTIVE	TARGET	KEY PERFORMANCE INDICATOR (KPI)	UNIT	APPLICABILITY	RELATADO PÓS JOGOS
To reduce air pollution (reduce GHG emissions)	100% of Rio 2016 procured buses and generators running with B20 biodiesel fuel	Amount of B20 biodiesel fuel used on Rio 2016 buses and generators Vs. Total amount of fuel used on Rio2016 buses and generators	%	Games Time	98%
	80% dos veículos leves adquiridos pelo Rio 2016 movidos a Etanol 80%	Amount of ethanol used on Rio 2016 procured light vehicles Vs. Total amount of fuel used on Rio2016 light vehicles	%	Games Time	99%
	Reduce the total amount of fuel used in Rio 2016 fleet (light vehicles and buses)	Amount of fuel Vs. Estimated amount of fuel at the baseline of 2013	R	Games Time	
	Maximise the procurement of local suppliers	Brazilian suppliers procured by Rio 2016 Vs. Total of suppliers procured	%	Games Time and Test Events	88%
	Maximise the procurement of local suppliers	Suppliers from Rio de Janeiro state Vs. Brazilian suppliers	%	Games Time and Test Events	62%
	Reduce the total amount Km of logistics	Amount of logistics km Vs. Estimated amount of logistics km at 2013 baseline	R	Games Time	Quantification not possible

Table 10. Transport and logistic performance indicators (Source: Rio 2016, 2018).

SUSTAINABLE DESIGN & CONSTRUCTION					
GENERAL OBJECTIVE	TARGET	KEY PERFORMANCE INDICATOR (KPI)	UNIT	APPLICABILITY	RELATADO PÓS JOGOS
To reduce water consumption	% of new bathrooms procured by Rio 2016 with water efficient fixtures	Number of new bathrooms procured by Rio2016 with water efficient fixtures Vs. Total number of new bathrooms procured	%	Games Time	Quantification not possible
To reduce energy consumption	Maximise the use of equipment procured by Rio 2016 certified by PROCEL A	Number of PROCEL A certified equipment procured by Rio 2016 Vs. Total number of equipment procured by Rio 2016 for which PROCEL certificate is applicable	%	Games Time	98%
	Percentage of generators reduced from the baseline	Number of generators procured Vs. Estimated number of generators at NRG 2013 baseline	N	Games Time	Quantification not possible
	Percentage of electricity used Vs Estimated electricity baseline	Amount of electricity consumed Vs. Estimated electricity at NRG 2013 baseline	%	Games Time	106%
To reduce material consumption	Reduce the total venue footprint of Rio2016 operational areas	Overlay constructed area (OB6/2016) Vs overlay estimated area to be constructed in OB2/2013	N	Games Time	80% (approximate value)
		Footprint area of secure perimeters (OB6/2016) Vs estimated footprint area of OB2/2013	N	Games Time	No change
	Increase the recycled content within the new waste bins procured by Rio 2016 to minimise the use of raw materials	Amount of recycled content in new bins provided by suppliers	%	Games Time	100%

Table 11. Sustainable design and construction performance indicators (Source: Rio 2016, 2018).

WASTE MANAGEMENT					
GENERAL OBJECTIVE	TARGET	KEY PERFORMANCE INDICATOR (KPI)	UNIT	APPLICABILITY	RELATADO PÓS JOGOS
To promote sustainable waste management	Maximise recycling and reuse during Games time	Amount of waste recycled or reused Vs. Total amount of non-organic waste generated during Games time	%	Games Time	18%
	Maximise the opportunity for cooperatives to benefit from collecting and selling recycled materials	All recyclable waste goes via the cooperatives	Yes or No	Games Time	Yes
	Maximise rent or reuse of overlay procured by Rio2016	Amount of overlay rented and returned to supplier Vs. Total amount of overlay	%	Games Time and Test Events	100%

Table 12. Waste management performance indicators (Source: Rio 2016, 2018).

ENVIRONMENTAL CONSERVATION					
GENERAL OBJECTIVE	TARGET	KEY PERFORMANCE INDICATOR (KPI)	UNIT	APPLICABILITY	RELATADO PÓS JOGOS
To reduce impacts on Biodiversity	Reduce vegetation to be removed	Number of trees and vegetation removed according OB6/2016 Vs. Number of trees and vegetation estimated to be removed on OB2/2013	%	Games Time and Test Events	Quantification not possible
	Zero significant impacts on any protected areas by avoiding occupation within any designated/ protected areas of nature conservation	Number of significant incidents involving occupancy inside protected areas	%	Games Time and Test Events	0
	Zero significant incidents involving fauna on venues	Number of incidents involving fauna	N	Games Time and Test Events	0 significant incidents, 10 minor incidents with successful rescue of animals

Table 13. Environmental conservation performance indicators (Source: Rio 2016, 2018).

4. TERRITORIAL GOVERNANCE IN JAPAN

The chapter aiming to give an overview of Japan's territorial governance chiefly under the analysis of the sustainable aspect, to prepare the ground for the Tokyo 2020 sustainability plan. During the first cases analysed it was depicted some aspects related to the territorial governance: some objectives presented in the IOC's plans are mirrored in planning documents already established or new agencies introduced have similar characters of bodies in the host country. The intention will be examining the territorial governance of Japan for understanding a sustainability plan that is on paper and not yet defined at all in terms of policies also due to the Covid-19 spread. Before to go on and focus on the structure, tools, and discourse of Japan a brief geographical introduction is provided.

Japan is an island nation situated off the eastern seaboard of the Eurasian continent in the northern hemisphere. The islands form a crescent-shaped archipelago stretching from northeast to southwest parallel to the continental coastline with the Sea of Japan in between. It consists of five main islands of Hokkaido, Honshu, Shikoku, Kyushu and Okinawa, and more than 6,800 smaller islands of varying sizes. Its surface area totals approximately 378,000 square kilometres (MIC, 2019). Japan is divided into eight regions. There are the three largest metropolitan regions: National Capital (Tokyo), Kinki (Osaka-Kobe-Kyoto), and Chubu (Nagoya) regions. In addition to these, there are the Hokkaido, Shikoku, Kyushu, Tohoku and Chugoku regions. From the eighteenth century through the first half of the nineteenth century, Japan's population remained steady at about 30 million. Following the Meiji Restoration in 1868, it began expanding its population with the drive to build a modern nation-state. In 1926, it reached 60 million, and in 1967, it surpassed 100 million people. Nevertheless, Japan's population growth has slowed in more recent years, with the rate of population change about one per cent from the 1960s through the 1970s. Since the 1980s, it has declined sharply. Japan's total population was 127.09 million according to the Population Census in 2015. This was a decrease by 962,607 people as compared to the previous Census (2010), indicating the first population decline since the initiation of the Population Census in 1920. In 2017, it was 126.71 million, down by 227,000 from the year before. In 2015, Tokyo Metropolis had the largest population of 13.52 million among Japan's 47 prefectures, followed in decreasing order by the prefectures of Kanagawa, Osaka, Aichi, and Saitama. These five prefectures each had a population of 7 million or more and together accounted for 36.4 per cent of the total population.

Figure 17. Japan's prefectures subdivision (Source: www.pinterest.co.kr).

Besides, the population density in Tokyo Metropolis was the highest among Japan's prefectures, at 6,168.7 persons per square kilometre. This was almost 18.1 times the national average (MIC, 2018). The Ministry of Land, Infrastructure, Transport, and Tourism has estimated the population for each 1km2 in a grid of Japan in 2050, indicating that

population in the year will fall by at least 50% from the present levels in about 63% of inhabited grid squares and to zero in about 19% of such squares. Squares with a lower population will see faster drops in population. Regions including such squares will lose shopping, medical care, nursing care, and other life support services remarkably and have difficulty in maintaining the present living standards (MLIT, 2015).

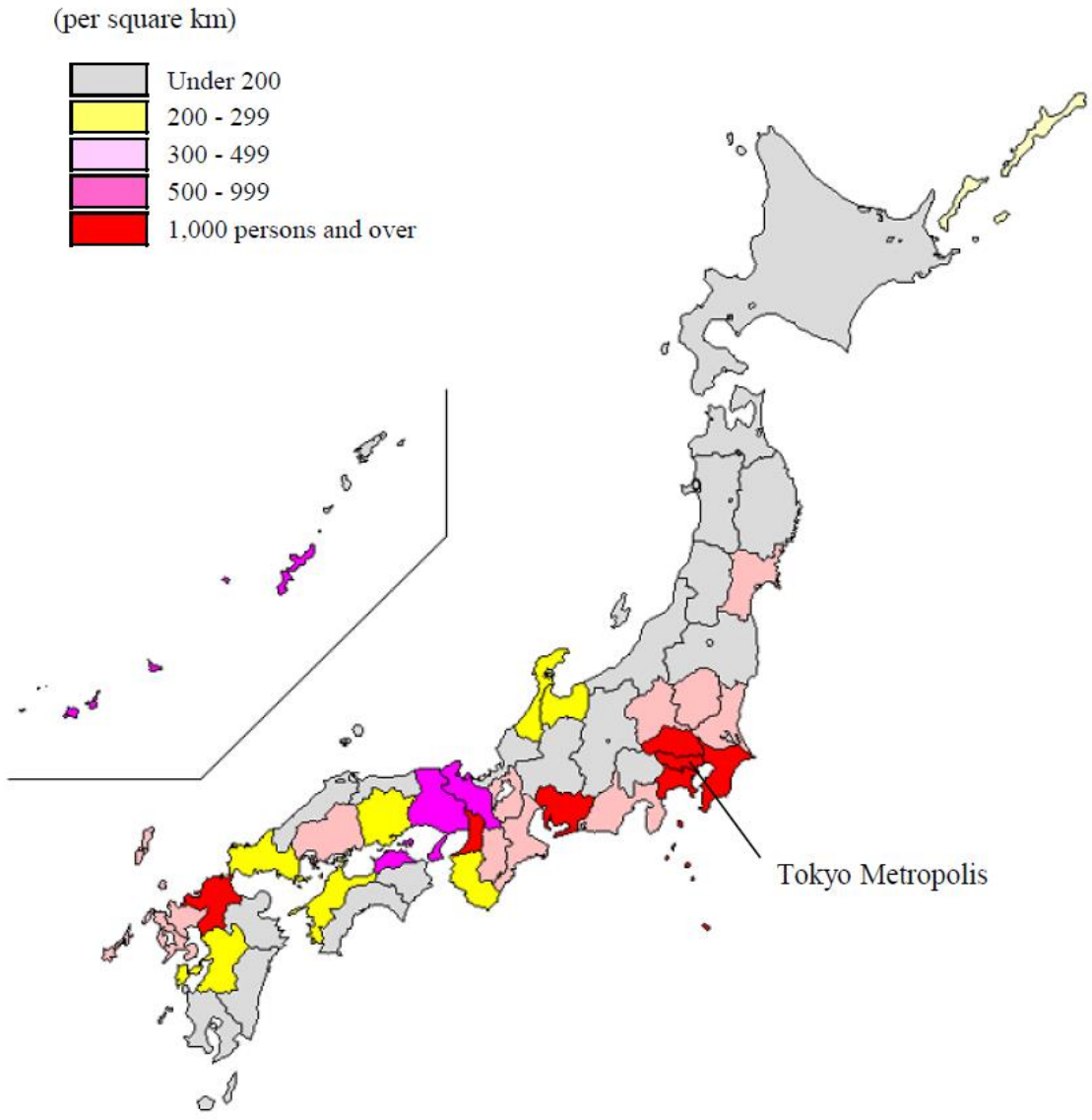

Figure 18. Population density by prefectures (Source: MIC, 2019).

To mitigate the uneven population distribution, Japan will have to cap the outflow of the population from rural regions to the Tokyo region and adjust the excess concentration in Tokyo. The elderly's share of the total population in Japan exceeded 25% in 2013, indicating that Japan has become the world's most aged society. Particularly, the birth-rate fell has

brought about a further fall in the young or productive population and a further increase in the elderly population over recent years, leading the ageing of Japanese society to accelerate. The elderly's share of the population is expected to continue rising in the future, exceeding 30% in 2025 and approaching 40% in 2050. The elderly population is expected to peak in rural regions around 2025 and continue substantial growth in large metropolitan regions (MLIT, 2015). In Japan, the percentage of persons aged 65 years old and over exceeded 10 per cent in 1955 in Germany, 1965 in Italy, and 1970 in the U.S.A., all earlier than in Japan. However, in 2015, the percentage of the population aged 65 years old and over in Japan was 26.6 per cent, exceeding the U.S.A. (14.6 per cent), France (18.9 per cent), Sweden (19.6 per cent), Germany (21.1 per cent), and Italy (22.4 per cent), indicating that the ageing society in Japan is progressing quite rapidly as compared to the U.S.A. and European countries (MIC, 2019).

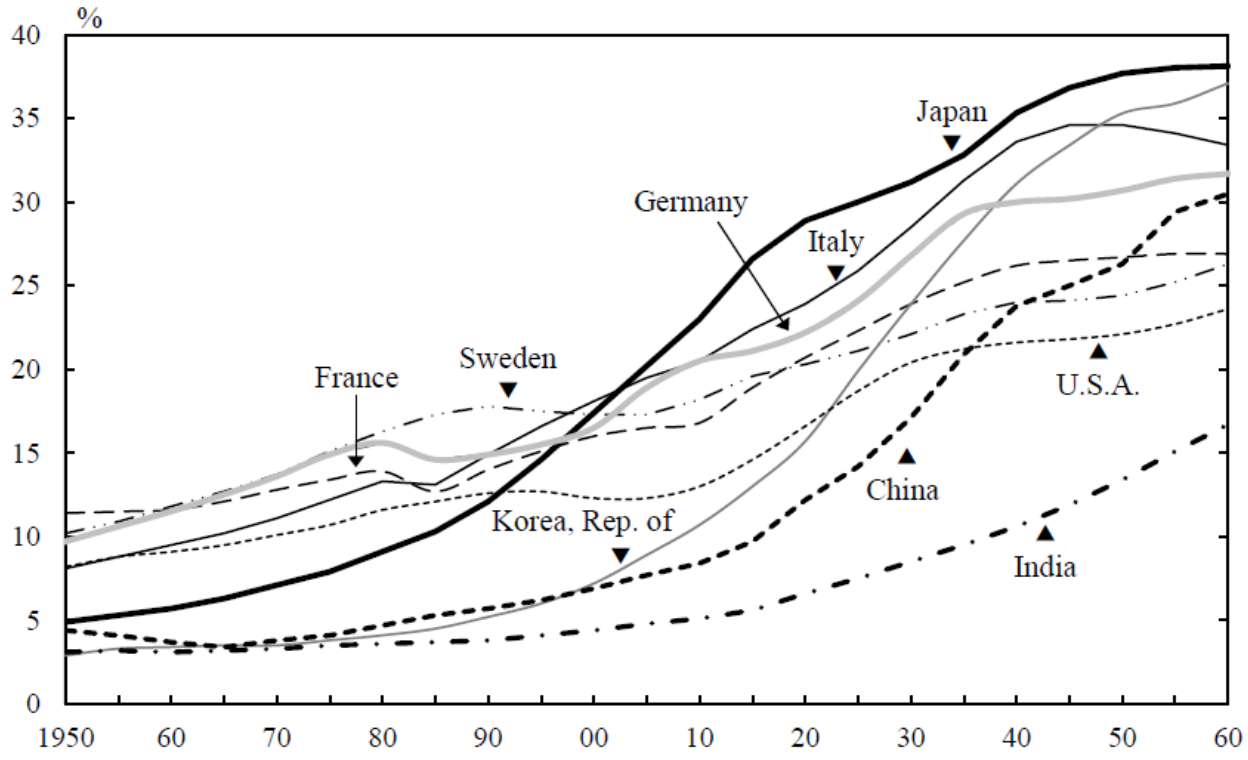

Figure 19. Proportion of Elderly Population by Country (Aged 65 years old and over) (Source: MIC, 2019).

The decline in population is exerting large impacts on national land space. In rural regions where the population has already been decreasing, problems have been developing, including underutilized or unutilized downtown land, deserted farmland, forests which have not been managed adequately, and land properties whose owners are difficult to find.

Vacant houses have increased in rural regions and suburbs of large metropolitan regions and are expected to increase further in line with a decline in the number of households. At the same time, a population decline can generate surplus spaces through a drop-in development pressure, providing an opportunity to manage such spaces systematically, strategically, and slowly for improving natural and living environments (MLIT, 2015).

4.1. The structure of the territorial governance

Japan is a unitary state with three levels of government: the national level, 47 prefectures and 1 741 municipalities. As of April 1, 2018, Japan has 47 prefectures, within which there are 1,718 municipalities, plus the 23 Cities in metropolitan Tokyo (MIC, 2019). The national government has five distinct functions related to spatial planning. First, it enacts framework laws that structure land-use planning processes. Second, it prepares national-level spatial plans. Third, it provides funding for major infrastructure projects that affect land use directly and indirectly. Fourth, it approves spatial plans that prefectures prepare according to national law and finally, it issues binding regulations on the content of subnational plans, provides standards for other instruments of lower-level governments, and gives general guidance and advice to subnational governments. Prefectures are responsible for the enactment of local laws and regulations on spatial planning, the preparation of prefecture-level plans, and the approval of municipal level land-use plans. Furthermore, they provide guidance and advice to municipalities. Actual zoning decisions are made by prefectures and municipalities. They prepare strategic and zoning plans following national and prefectural laws and regulations and pass auxiliary regulations guiding land use in their jurisdictions (OECD, 2017).

4.1.1. Constitutional and legal framework for territorial governance

The Constitution of Japan, adopted in 1946 and which went into effect on May 3, 1947, is based on three core principles: the sovereignty of the people, respect for fundamental human rights and pacifism. To control governmental power effectively through checks and balances, governmental power is separated into three independent branches: legislative,

executive, and judicial, and each contains a separate set of agencies and personnel (MIC, 2019).

The Diet is the highest organ of state power and is the sole law-making organ of the State. The Diet consists of the House of Representatives and the House of Councillors. Both Houses consist of elected members, representative of all the people. The most important responsibility of the Diet is to enact legislation. The Diet also has the authority to fulfil several additional functions, including the deliberation and passage of the budget and other concerns of fiscal importance, the approval of treaties, the designation of the Prime Minister and the initiation of motions to amend the Constitution. Each House may conduct investigations relating to the government, and demand the presence and testimony of witnesses, and the production of records.

For the Diet to pass a resolution, the agreement of both Houses of the Diet is necessary. Nevertheless, when the two Houses differ in their resolutions regarding legislative bills, draft budgets, the approval of treaties or the designation of the Prime Minister, under the terms of the Constitution, the decision of the House of Representatives overrides that of the House of Councillors. The Cabinet exercises its executive power based on the laws and budgets adopted by the Diet. The Cabinet, composed of the Prime Minister and other Ministers of State, is collectively responsible for the Diet, regarding the exercise of the executive power. The Prime Minister is elected in the Diet from among its members. Many of the ministers of state to be designated by the Prime Minister must be Diet members. Therefore, Japan adopts the parliamentary Cabinet system, in which the organization and existence of the Cabinet may stay on the confidence in the Diet (MIC, 2019).

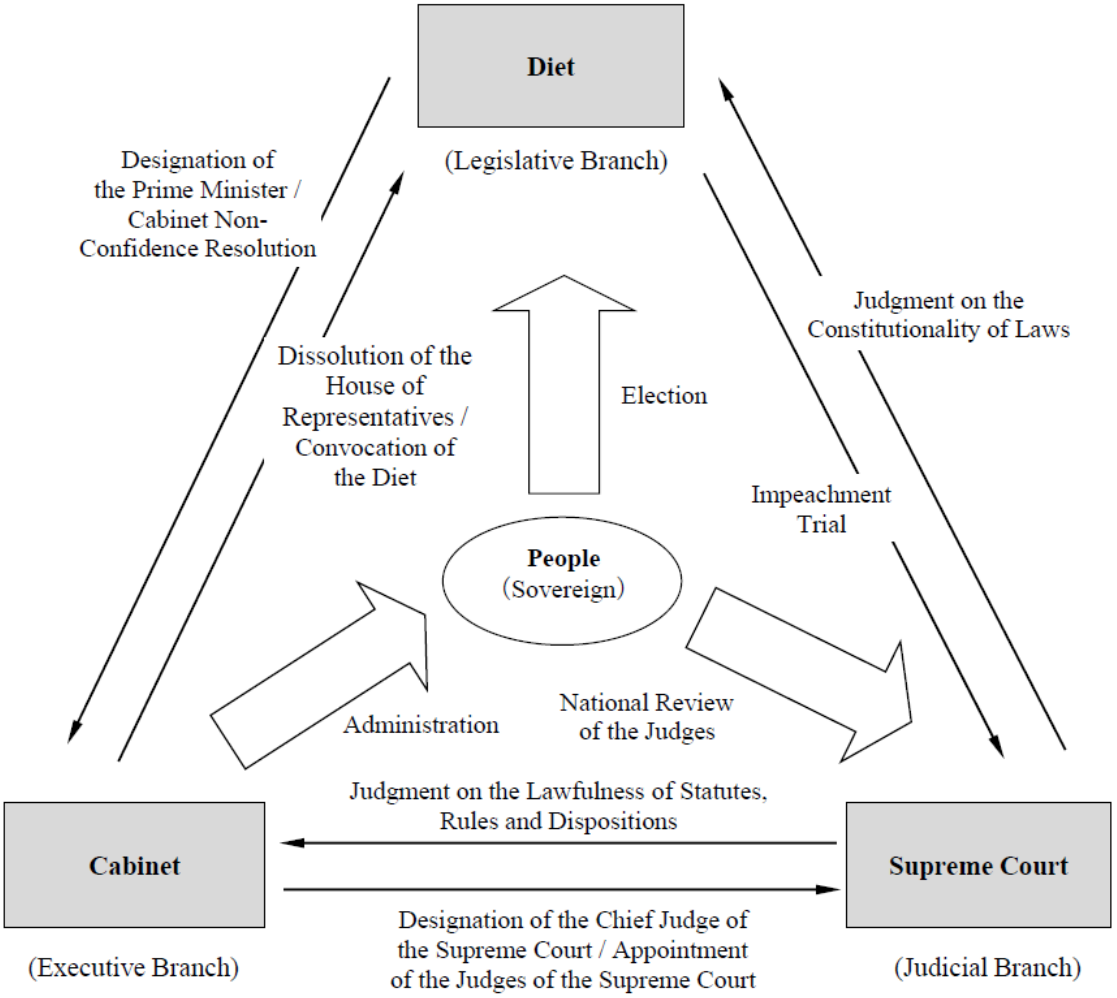

Figure 20. Separation of Powers under the Constitution of Japan (Source: MIC, 2019).

4.1.2. The local government

The affairs of local governments are conducted on two levels in Japan: by the prefectures and by the municipalities within each prefecture. Local government in Japan has its basis in the nation's Constitution establishing the age of "local government," providing a legal basis for local government and recognizing the system of local government as part of the Constitutional system. Local government in Japan has its basis in the nation's Constitution, adopted in 1946, establishing the age of "local government," providing a legal basis for local government and recognizing the system of local government as part of the Constitutional system.

Under the heading "Local Government," Chapter 8 of the Constitution contains the following four Articles:

- Opening with a declaration of respect for local government and its basic principles.
- Providing that heads of local governments and members of assemblies be elected by direct public elections.
- Stating clearly that local governments should have a broad range of authority over a broad range of administrative functions and granting local legislative authority within the local jurisdiction.
- Imposing restrictions on the enactment of special legislation applicable only to a given local government.

Accordingly, several laws were enacted concerning local government, but the core legislation for dealing with its organization and management is the Local Government Law. The provisions of the Local Government Law deal mainly with residents' affairs, elected councils, and their executive bodies—all that which forms the core of local government. The Law also specifies the status of local governments, including their relationship with the national government as well as with other local governments, and has legal provisions for their financial affairs and other important administrative matters.

As such, local government is clearly defined in Japan's Constitution and other national laws. To strengthen the administrative and fiscal foundation of the municipalities, municipal mergers were promoted by law. Consequently, the number of municipalities was reduced by nearly half from the 3,232 existing at the end of March 1999. Municipalities that satisfy certain population criteria (i.e., 500,000 people or more) are eligible for designation as "Ordinance-designated cities". This designation gives them administrative and fiscal authority equivalent to those of prefectures. With the addition of Kumamoto City in April 2012, there are presently 20 cities that have earned this designation (MIC, 2019). Accordingly, several laws were enacted concerning local government, but the core legislation for dealing with its organization and management is the Local Government Law. The provisions of the Local Government Law deal mainly with residents' affairs, elected councils, and their executive bodies—all that which forms the core of local government. The Law also defines the status of local governments, including their relationship with the national government as well as with other local governments, and has legal provisions for their financial affairs and other important administrative matters. The Local Government Law specifies that the basic units of local government shall be the prefectures and the municipalities. Local government in Japan is based on a system introduced by the national government as part of its drive to modernize the country at the end of the last century. At

that time the system reflected stronger national governmental control than that of today; the former practice of centrally appointed governors is just one example of how strong the control was. Much of that early system has been passed down to the present, though it has to be stated that the local government's authority has increased substantially since the early post-war period, despite little structural change (MIC, 2018).

In any system of local government, the number of tiers is usually directly related to such factors as geographical conditions, population levels, the nature of local administration and the corresponding level of centralization. In Japan, local government is two-tiered: prefectures serving wider areas, and municipalities providing local services. Besides, there is a system by which municipalities of a certain size can deal with what is generally considered to be prefecture administrative work. By government decree, they are called designated cities, core cities or special case-cities (CLAIR, 2006). As it will possible to appreciate in the next section, Japanese planning systems is a complex set of ingredients covering legal and legislative controls, plan-making, land use planning, zoning, control overpopulation density carried out at three levels - national, regional and local.

4.2. The planning tools

The Japanese spatial planning system is complex and employs many spatial plans. At the national level, two plans provide strategic directions. The National Spatial Strategy (National Plan) gives general principles on a national spatial structure, land use, environmental protection, sustainable use of resources and disaster prevention. Instead, the National Land Use Plan (National Plan) includes a master concept for land use and outlines necessary measures to achieve it.

At the prefectural level, Basic Land Use Plans play a comparable role to the National Land Use Plan. They are strategic plans that focus on general policy objectives for spatial development. Then, Master Plans for City Planning Areas concern only urban areas within prefectures and outline the objectives for land-use planning in those areas, such as targets for development promotion and development control. The actual land-use plans at the prefectural level are the City Plans of Prefectures. These plans do not refer to a single city, but generally cover the entire urban area of a prefecture. Among other aspects, they delineate areas where urbanisation is promoted or controlled, which has substantial consequences for the types of authorised developments and the planning approval process.

Furthermore, they contain special zoning regulations for specific developments and show principal transport infrastructure. They are typically drawn at scales between 1: 50 000 and 1: 10 000 and are among the plans that are the most strictly enforced.

The municipal level mirrors the prefectural level insofar as its main planning instruments are a master plan and an actual zoning plan. Municipal Master Plans are strategic plans that contain general objectives for the municipality and guidelines for zoning and adjustments to land uses. City Plans of Municipalities are the main local land-use plans. They contain detailed zoning maps and restrictions on building sizes and shapes, assign major urban redevelopment areas and present public infrastructure.

In addition to the plans described above, several sectoral plans exist at all levels of government. These plans concern only specific land uses, but provide legally binding, sometimes detailed zoning regulations. For urban areas, three distinct plans exist. The Plans for Urban Renaissance Areas outline urban redevelopment projects and policies to strengthen the competitiveness of cities. Landscape Plans target urban design aspects, for example by restricting outdoor advertisement. Location Optimization Plans prescribe settlement patterns in urban areas intending to promote compact development and high population densities (OECD, 2017).

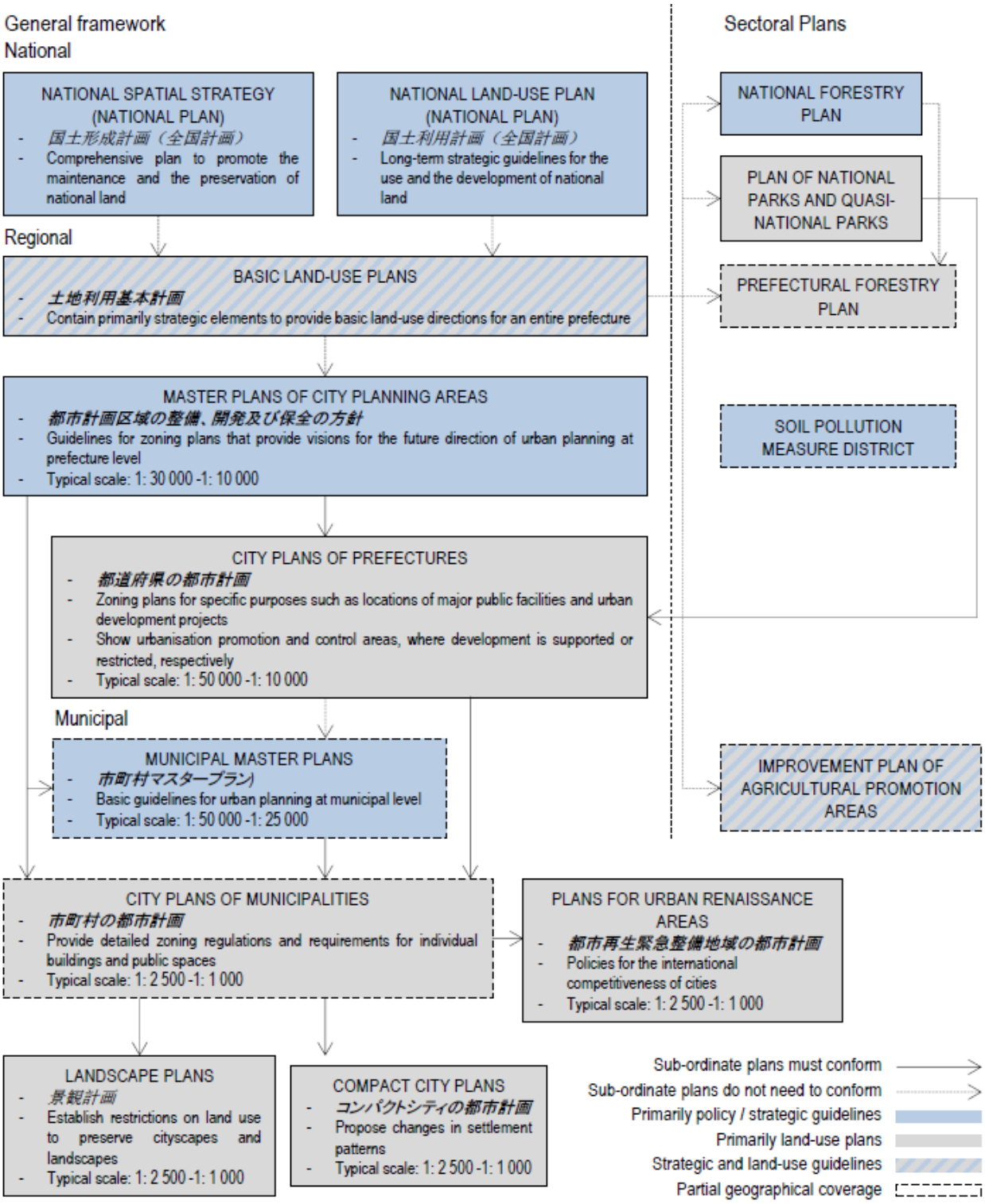

Figure 21. Japan planning tools overview (Source: OECD, 2017).

4.2.1. The New National Land Sustainability Plan

Faced with the demographic decline of the country, the Ministry of Territory, Infrastructure and Transport decided to drastically revise the previous Global National Spatial Development Act and to replace the Global National Development Plans with the new National Spatial Sustainability Plan to ensure national and regional planning systems that adequately meet the needs of the new era. Following active discussions on the Diet, the Bill was passed on 22 July 2005, declared on 29 July 2005 and entered into force on 22 December 2005. The main points of the "Act for partial amendments to the Global Law for the Development of the National Territory and other laws to promote the sustainable development of the national territory" are the following:

- To focus more on qualitative rather than quantitative development of the national territory, which was the basis of the existing national and regional plans, the national and regional plans have been reformed to fully promote measures concerning the use, improvement and conservation of the national territory, reviewing what should be planned;
- To encourage the participation of the various stakeholders in the planning process, a system of proposals by local governments and a system for reflecting public opinion has been introduced;
- To respect the autonomy of the regions and implement the partnership between central and local government, in addition to the National Plan, Regional Plans have also been introduced. The plans are planned in each block through the mutual collaboration and cooperation of central governments and prefectures, under the appropriate divisions of every role;
- To make the national and regional planning system easily understandable to the public, it has rationalized and consolidated the national and regional planning system (MLIT, 2006).

The National Land Sustainability Plan is a comprehensive and fundamental plan to promote the use, improvement and conservation of the national territory and covers the following points:

- Use and conservation of national territory resources, such as land, water and other resources.
- Use and conservation of coastal areas (including exclusive economic zones and the continental shelf).
- Prevention and mitigation of disasters such as earthquakes, floods, windstorms and others.

- Accommodation and improvement of the size and location of urban/rural areas.
- Adequate location of industries.
- Use, improvement and conservation of transport, information and telecommunications facilities, science and technology research facilities and other important public facilities.
- Protection of resources and use and improvement of facilities, in terms of culture, welfare and tourism.
- Environmental conservation, including the creation of a healthy environment and the formation of a healthy landscape.

The fundamental principle of the National Territory Sustainability Plan is related to the appropriate management of changes in the social-economic structure, including changes in population and industry, and the attempt to realize the national territory that is the basis:
a) regional communities that develop independently according to their uniqueness.
b) a vibrant economic society through the strengthening of international competitiveness and the promotion of science and technology.
c) people's lives so that their security is guaranteed.
d) a productive environment that also contributes to the preservation of the global environment.

Furthermore, the Plan establishes appropriate measures for the formation of the national territory that maintain and improve the conditions of the territory, considering national and international collaboration. While respecting the independent approaches of local authorities, it is of paramount importance to fulfil central government obligations based on intrinsic roles, including the implementation of measures to be implemented at the national level or in a national perspective (MLIT, 2006).
In terms of content, the basic policy, objectives, and basic measures that are necessary from a national point of view are set out as a guideline for measures concerning the overall national training. They must be in accordance with the central government's basic plans on environmental conservation. With regard to the planning process, the Minister of Territory, Infrastructure and Transport should take the necessary steps to reflect the views of the public, discuss with the head of the administrative bodies involved, listen to the views of the prefectures and cities designated by the government, through surveys and discussions in the National Territory Council, prepare the draft plan and obtain the approval of the Cabinet.

as shown in the picture below. Finally, it has as a further objective to prepare the plan and the national use plan in an integrated way (MLIT, 2006).

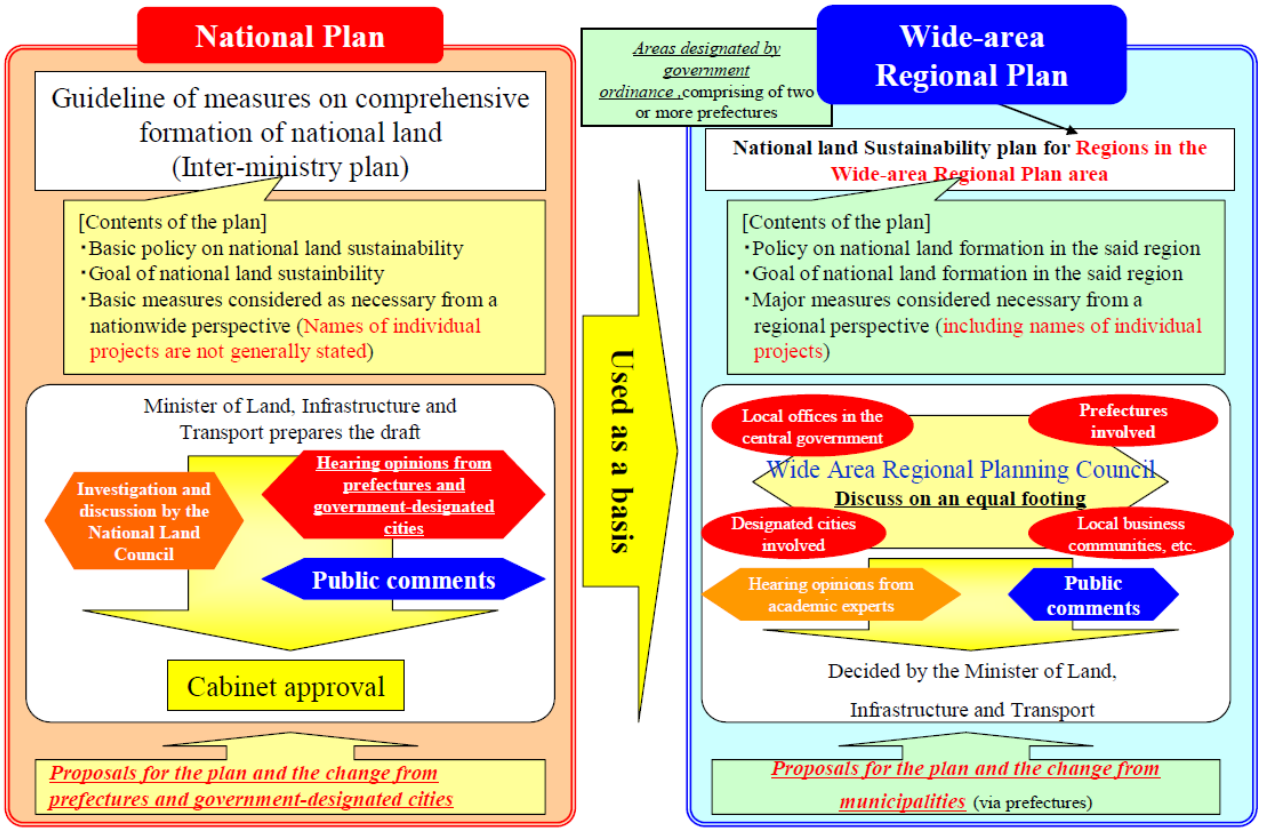

Figure 22. The New Framework of the New National Land Sustainability Plan (Source: MLIT, 2016).

4.2.2. The National Capital Regional Basic Plan

As regional level and as a most significant example this section will deal with the National Capital Regional Basic Plan referred the metropolitan area of Tokyo and seven prefectures surrounding the city. Regional strategies sustained influential changes as the population of Tokyo and three prefectures of southern Kanto (of which Tokyo forms a part) jumped from 15.4 million in 1955 to 27.0 million in 1975 - an increase of 11.6 million in only twenty years. The first 1958 plan covered an area of 100 km radius and was shaped after the Greater London Plan of 1944. It emphasized restriction of new construction that contributed to population concentration, development of green belts and endowment of industrial areas in the suburbs. Still, many of these strategies could not stand the force of population increase and high economic growth. The 1968 Plan shifted the emphasis from the physical restriction

of growth to that of promoting planned urban development. The further accent was provided for these strategies in the 1976 Plan considering the increases in population. Safety and environmental capacity, expansion of urban areas, housing and industrial development received prominence in these plans. The NCR Basic plans promote several projects including motorways, rapid transits, new towns, and water resource development projects. Along with the restructuring of the National Land Plan System carried out in July 2005, the National Capital Region Development Act was partially revised, whereby the National Capital Region Development Plan became composed of the “Basic” and “Development” parts while the previous project plans were abolished. Albeit the Basic part applied to be formulated as the framework of the Capital Region Development Plan before the revision of the Act, under the new Plan, it has become a guideline for plans concerning the capital regional development that clarifies the basic policy concerning the future development of the Capital Region, the future vision for the Region to aim for and the direction of efforts towards the realization needs to be addressed. Based on the Basic part, the Development part sets out what should be the foundation concerning the development of facilities specified in the National Capital Region Development Act for Roads, Railways, etc. in built-up areas, Suburban Development Zones, and urban development areas. The plan period for the current Development part is for about five years from the fiscal year 2006. This part introduces, not specified plans, the plan to proceed with the formation of disaster-resistant urban structure (e.g. development of disaster prevention bases) by promoting the “renovation of the metropolitan area” utilizing support from city development projects by private sectors and existing stocks so that the Region can continue to develop, retaining the safe and comfortable living environment. This part also indicates that Tokyo Metropolitan Government (TMG) divides the Capital Region into six regions (e.g. central Tokyo and suburb areas) and promote regional development according to the characteristics of each region, reorganize and develop the urban spaces by enhancing advanced urban functions and reinforcing residential functions in central Tokyo, and form highly-independent in suburbs by developing core business cities and promoting proper role sharing between these cities and central Tokyo (Tokyo Metropolitan Government, Basic laws and regulation, 2019, www.toshiseibi.metro.tokyo.jp/eng/pdf/index_02.pdf?1503).

4.2.3. The regulation of land use at the local level

In the City Planning Area, it becomes to be reasonable to divide the area into two areas: Urbanization Promoting Area and Urbanization-restricted Area. According to the City Planning Law, the Urbanization Promoting Area is defined as an area which already forms urban area and should be urbanized preferentially and regularly during about 10 years; instead, the Urbanization restricted Area is defined as an area which should be controlled its urbanization (Tominaga, 2011). This area division is effective to centralize the public investments in the Urbanization Promoting Area and control a certain amount of developments in the Urbanization-restricted Area. On the other hand, local cities can choose whether to divide the City Planning Area or not, because once the area divided, it turns to be more difficult to develop in the Urbanization restricted Area. As options for Undivided City Planning Area, there are 12 different kinds of “Use Districts” in which control the purpose of land use and its figure. Local cities that are not divided in the City Planning Area can designate the Use Districts selectively and control developments because, in Undivided City Planning Area, all developments are allowed in principle.

About the building permission, a person who is planning to use the land for development action should get permission from the prefectural governor. The target size of each development action is different between the Urbanization Promoting Area, the Undivided City Planning Area and outside of the City Planning Area and development action is required to meet technical standards. Additionally, in the Urbanization restricted Area, there are strict locational criteria and few development actions which meet the criteria can be constructed (Tominaga, 2011).

4.2.4. The use districts and group rule of buildings

There are 12 kinds of use districts - 7 kinds of residential districts, 2 kinds of commercial districts and 3 kinds of industrial districts - prepared in the City planning law and these districts can be specified in the Urbanization Promoting Area and the Undivided City Planning Area selectively as discussed above. Each district controls land use: for instance, hotels cannot be developed in Category 1 exclusive low building residential zone. Depends on the objective of each district, it can be possible to decide the building coverage, floor-space ratio, height limitation, floor-space ratio limitation of road, diagonal line limitation for

road and adjacent land and shadow area limitation. Japanese building code (rule) is regulated by Building Standard Act and it sets out minimum standard (but it extends to so minute) of the site, facilities, infrastructure, usage and so on of a building. Whole codes can be divided into Single code and Group code. Single code sets out about the safety and health of a building itself. For example, there is the strength code of structure to stand up when the earthquake comes, and all buildings are required to meet this code. On the other hand, group code more concerns about the relation between a building and city, surrounding environment, not a building itself (Tominaga, 2011).

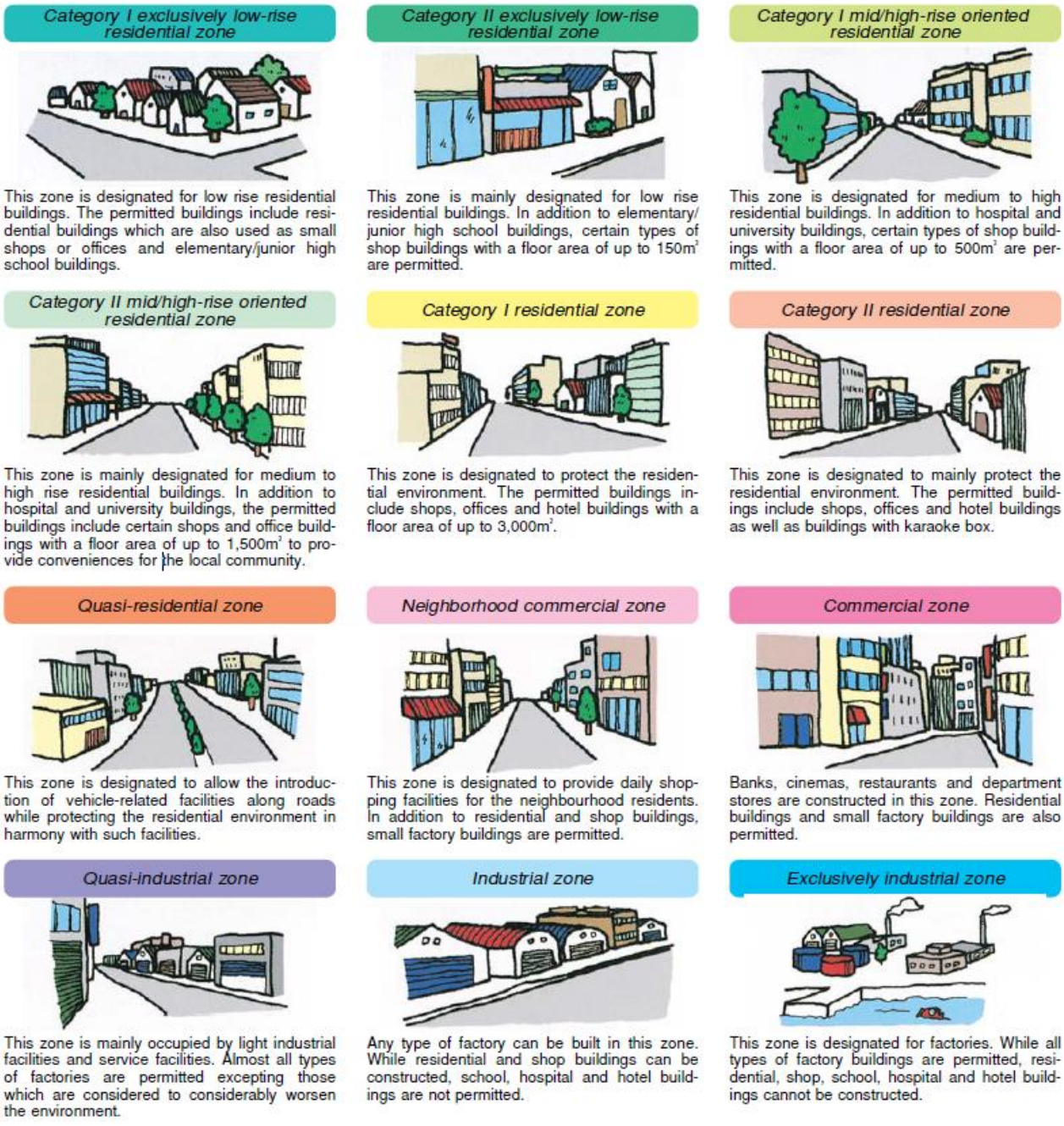

Figure 23. Land use zones (Source: MLIT, 2003).

4.2.5. The master plans

In the Local Autonomy Law, each municipality is expected to produce a fundamental plan which defines basic ideas and purposes as a text to put into practice their town management and plans. Different from the fundamental plan there are “City Planning Area Master Plan” and “Municipal Master Plan” as texts including drawn plans. The City Planning Area Master Plan is applied to each City Planning Area and decided by prefectural governments. It describes the objective of city planning and whether to divide the City Planning Area into the Urbanization Promoting Area and the Urbanization-restricted Area or not. It also describes the principle for conducting the land use and city facilities in City Planning Area. The City Planning Area Master Plan is usually a larger scale plan than the Municipal Master Plan and reflects it. On the other hand, the Municipal Master Plan is made in each municipality as a text including drawn plans and its contents must correspond to the fundamental plan and the City Planning Area Master Plan. It describes the grand design of a city, for example, the ideal images of the road ahead and problems that should be overcome. It also describes the regional designs which are plans and strategy of a smaller part of the city. Both City Planning Area Master Plan and Municipal Master Plan are not mandatory regulations but just plans which describe the direction of developments in each area and municipality. However, these are as important as the basic plans (Tominaga, 2011).

4.2.6. The district planning

In 1980, the district planning system was set up in the City Planning Law using models from German B-Plan. The system is the first city planning system anchored by municipalities and citizens. Recently, a more bottom-up approach to city planning is assuming strength in Japan. This system is a tool to make more micro-plan and it is also a comprehensive plan in a certain district. The contents and implementation tools of the system are flexible, and citizens can participate in the process of building the plan. The target districts of this system are in the use districts or the outside of the use districts (the Urbanization-restricted Area or the Undivided City Planning Area) which meet some conditions. The objective of the target district and the plan is to adjust the district is planned with this system (Tominaga, 2011). Details of regulations and planning practices are specified in separate legislation. For instance, the Building Standard Act regulates building activities following the zoning plan,

and the Land Consolidation Act provides legal procedures for land consolidation projects on sites specified in the authorized city plans (JICA, 2007).

4.3. The discourse on territorial governance

This section aims to present principally the historical trend of environmental policies in Japan. Since these policies focused on pollution management, there was little coordination among environmental policies, urban policies, and development. In the late 1990s and 2000s, as environmental problems became multifaceted, an integrated approach was needed to coordinate with more stakeholders and cover different sectors. A city authority became more important in taking initiatives rather than vertically structured approaches of central government ministries. In this context, comprehensive and sustainable urban development approaches well-coordinated with environmental policies will be the focus.

4.3.1. Actions against pollution: 1950s–1960s

Industrialization and urbanization from the 1950s caused serious pollution particularly due to emissions from plants. Some local authorities acted by establishing their ordinances on pollution control, ahead of the central government. The Ordinance on Factory Pollution Control was formulated by the Tokyo metropolitan area in 1949, followed by Osaka prefecture in 1950, and Kanagawa prefecture in 1951. Succeeding, in line with ascending public calls for pollution controls, the national government began to act in the late 1950s. In 1958, two laws on water quality, namely the Act on Conservation of Water Environment and the Industrial Effluent Water Act were established as legal regulations against water contamination. As for air pollution control, the Act on the Regulation of Smoke Emission was formulated in 1962. The Basic Act for Environmental Pollution Control was formulated in 1967, which clearly defined the responsibilities of polluters, the central government, and local authorities on air pollution, water contamination, and waste management. Environmental initiatives in the 1950s and 1960s focused on recovering health conditions adversely affected by pollution rather than improving the people's quality of life, which was mainly done through voluntary actions and regulatory frameworks.

Waste management became a serious concern in the rise of urbanization and industrialization. Along with the sophistication in the people's lifestyles and the advent of mass consumption, total waste volumes rapidly increased. In this sense, the Act on Standard to Prevent Pollution on Living Environment in 1963 introduced basic solid waste management policies on the incineration of solid waste and their disposal in landfills. It aimed to improve hygiene issues through incineration and to reduce disposed waste. Notwithstanding, the total volume of disposed waste continued to increase at an annual average growth rate of 6% in the late 1960s, due to further increases in generated solid waste. The increase in industrial waste became a serious issue. The volume of industrial waste was 24 times larger than that of domestic waste, which could not be treated through the existing framework for waste management. This caused environmental pollution due to dangerous waste and illegal disposal of industrial waste.

In 1970, the so-called Pollution Diet was held, where a series of pollution-related legal systems were reviewed and a total of 14 pollution-related draft laws were established. An environment agency was instituted in 1971 which managed environmental standards and emission control of pollutants at companies, a task had been originally assigned to various ministries and agencies. On the one hand, all other environmental projects except for pollution control, such as pollution prevention project or environmental improvement projects, remained in the care of other ministries. The environment agency's founding made much progress on industrial pollution control such as air pollution due to SO2. On the other hand, it was difficult to formulate comprehensive environmental policies due to the remaining vertically segmented administrative system (JICA, 2011).

4.3.2. Serious urban-oriented pollution along with urbanization and motorization

In the 1970s, as urbanization and motorization further progressed, urban-oriented pollution from household wastes and vehicle emissions became relevant issues. This after industry-oriented pollution due to factory emissions gradually improved. The impact of urban-oriented pollution covered a wider area and took longer periods than industrial oriented one, thereby requiring new institutional arrangements, such as vehicle emission control, as well as a review and expansion of the mandates of existing pollution control related institutions. Such urban-oriented pollution required more comprehensive environmental approaches.

However, environmental initiatives were still limited to the strengthening of individual regulations. In 1984, environmental impact assessment failed to be institutionalized due to opposition from industry groups (JICA, 2011).

4.3.3. Scaling up of actions toward energy efficiency and waste management

Two oil shocks in the 1970s strengthened the awareness of resource scarcity at the level of the individual, enterprises, and country. The concept of “energy efficiency” appeared and became widely used. The Act for the Promotion of Rational Uses of Energy and Recycled Resources in Business Activities, or the so-called Energy Saving Act, was formulated in 1979. It provided the basic concept for policies on energy efficiency in Japan, comprising with the regulation on energy-efficient performances and the promotion of energy-efficient actions. It made it obligatory for the affected factories to assign supervisors to manage energy and record energy use to promote the efficient use of energy and electricity in the industrial sector.

In the 1970s, plastic waste started to increase at annual growth rates of about 25%. Changes in waste composition became an emerging issue. Since the calorific value of plastic waste is 10 times higher than that of normal waste, plastics could not be treated conventionally through incinerator plants. The percentage of plastic waste reached 10% in some municipalities, which was the limit of the capacity of incinerator plants at that time. In response, the Waste Management Act of 1970 set basic policies on the management of general waste, including the sorted collection of combustible and non-combustible waste.

The Act also distinguished industrial from general waste and established its disposal framework: the polluters-pay principle requires enterprises to dispose of their industrial wastes, while general waste was under the jurisdiction of local authorities as practised before. Illegal waste disposal and inappropriate treatment of industrial waste became a social issue due to the lack of supervision from administrative bodies (JICA, 2011).

4.3.4. Countermeasures on global environmental issues

In the late 1980s, international interest on global environmental issues started to grow. In 1985, the Vienna Convention for the Protection of the Ozone Layer was adopted. In 1987, “sustainable development” was used in the WECD (World Commission on Environment and Development) report. To tackle global environmental issues and draft more comprehensive environmental policies, the Basic Environmental Act was passed in 1993, which took over the existing Basic Act for Environmental Pollution Control of 1967. Its basic concept was to formulate a sustainable society and promote global environmental protection through international collaboration. It was followed by a basic environmental standard-setting and the formulation of the Basic Environmental Plan.

In 1997, the Kyoto Protocol was adopted at the third Conference of the Parties (COP3). It pushed the government to actively promote actions against global warming and toward a recycling society. In 1997, the Act on the Promotion of Global Warming Countermeasures was legislated, which specified the roles and responsibilities of the central government, local governments, and the private sector in countermeasures on global warming (JICA, 2011).

4.3.5. Strengthening of energy-efficiency strategy and top runner approach

The discussions on global warming also increased to strengthen measures on energy. The Energy Saving Act was amended in 1993 and 1998 to strengthen regulations on the energy use of enterprises. Enterprises which were obliged to formulate basic strategies on energy use and to submit periodic reports expanded both in terms of scale and sector. The business sector was also covered as well as industries. The top runner approach was introduced in its amendment in 1998, which formed the foundation to promote private sector actions toward higher energy efficiency (JICA, 2011).

4.3.6. Actions toward a recycling society

After Japan entered a bubble economy, the total volume of waste increased again. The diversification of lifestyles increased the share of plastic containers, packaging, and PET bottles in the generated solid waste. Construction waste also increased from construction work in urban areas. The increasing waste volume tightened the shortage in final disposal sites, which led to the recognition of the need to promote a recycling society. In 1991, the Act for the Promotion of Utilization of Recycled Resources was formulated, followed by some laws to promote recycling. These included the Act on the Promotion of Sorted Garbage Collection and Recycling of Containers and Packaging formulated in 1995 and the Act for Recycling of Specific Kinds of Home Appliances in 1998. Emerging issues on waste management included countermeasures on dioxin, regional transfer of industrial wastes, and illegal disposal and treatment of industrial waste. The existing framework for waste management could not work properly to solve the above issues, where there was no economic incentive for waste generators to properly manage their waste.

A significant change in industrial waste management was required, which strengthened the polluters-pay principle and required waste generators to take responsibility for waste management. In 1993, the manifest system was introduced to clarify the responsibilities of waste generators and prevent illegal disposal. Ithich obliged waste generators to put a manifest on all industrial wastes. The manifest includes types and volumes of waste, name of disposal generator, collecting and delivery traders, disposal contractor, and others. It allowed the monitoring and management of the movement of industrial wastes properly and the identification of the responsible waste generators. Institutional frameworks to promote the restoration of the polluted environment were also developed. It included the promotion of an administrative subrogation and to ensure financing that would allow the restoration to their original state (JICA, 2011).

4.3.7. Comprehensive environmental strategy: in the 2000s

In the 2000s, international concern on the global environment further increased. In 2005, The Kyoto Protocol came into effect. In this context, it was expected to take further action on global environmental issues. The Energy Saving Act was amended in 2005 and 2008 to strengthen energy efficiency strategies. Regulation by enterprises, which was originally done by factories or buildings, was introduced in 2008.

Increasing awareness of resource-saving and necessity to reduce waste volume due to the shortage of final disposal sites has kicked into gear toward a recycling society. 2000 was defined as the “First Year of the Recycling Society” when the Basic Act on Establishing a Sound Material-Cycle Society was formulated, comprehensive frameworks were established to promote 3Rs (reduce, reuse, and recycle). It covered production, consumption, recycling, and disposal from upstream to downstream. Upstream policies include the Basic Act on Establishing a Sound Material-Cycle Society and Act for Promotion of Effective Utilization of Resources. Institutions for the collection and recycling stages include the Act for Food Waste Recycling and Act for Recycling of Specified Kinds of Home Appliances, Act on Automobile Recycling, and Act on the Promotion of Sorted Garbage Collection and Recycling of Containers and Packaging. The Wastes Management Act was also amended as a basic policy at the disposal stage.

From the late 1990s to 2000s, environmental problems diversified, as seen in global warming issues and the 3R promotion. Comprehensive approaches were inevitable to involve various stakeholders and cover different sectors, while pollution control focused on specific sectors. In this context, a city authority became more important in initiating comprehensive approaches rather than central government ministries which tended to focus on sectors under their jurisdictions. It also resulted in sustainable and comprehensive urban development approaches which harmonize with urban planning and environmental policies. Various city-based environmental programs were conducted including Eco-model projects initiated by the Cabinet office in 2008 and Environmental Action Model Projects conducted by the MLIT and MOE, Eco-town Programs by METI. Instead, concerning local governments undertook sustainable urban development strategies initiatives as follows:

- Urban Planning and Land Management Schemes for Sustainable Cities: Compact city development, public-transportation-oriented development, redevelopment of unused areas, integration of urban design with ecological systems, urban development resilience to disasters.

- Comprehensive Approach for Recovery from Pollution, from Gray to Green: Water environment, air environment.
- Comprehensive Approach for Energy and Resource Efficiency: Promotion of renewable energy and energy efficiency, management of domestic wastes, zero-emission industries.
- Financing Schemes for Sustainable Development: Financing for sustainability and resilience of cities, environmental taxation (JICA, 2011).

Overall, at the top of Japan's agenda is managing demographic changes for the next 30 years, which comes with a necessary adaptation of the size and distribution of infrastructure, and an emphasis on networks of cities and places. Following the great earthquake of 2011, disaster resilience has also been prioritised by the government and steps have been taken in that direction. Governance changes emphasise a network approach to regional policies and a common framework shared between ministries at the national level. The main addition is the definition of systems of cities as part of regional policies, building on connections and complementarities, between large metropolises and lower-tier cities as a potential for the economy. Rural policies are set around three main objectives: facing demographic challenges, ensuring thriving yet sustainable rural economies and preserving heritage, by also considering the specific challenges of mountainous and semi-mountainous rural areas (OECD, 2017).

5. TOKYO 2020 AS DRIVER OF INNOVATION FOR TERRITORIAL GOVERNANCE

The section addressed how planning experts envisioned Tokyo 2020 Olympic and Paralympic Games as an opportunity for innovation in different fields of planning based on the papers compiled in a special issue made in 2016 by the City Planning Institute of Japan (CPIJ). Accordingly, the review aims to reply at the following question: how should is envisioned future cities and societies and develop innovations to realize them after the 2020 Games? With this awareness in mind, experts in the fields related to urban planning such as urban policy, urban planning, urban design, open space planning, transportation planning and infrastructure discussed from this perspective.

Since it might be difficult to know about the effective progress of the sustainability plan, the research pursues to what the sustainability plan incorporate in several urban fields and what was expected from the urban planning side in 2016 when the bid for Tokyo 2020 was announced. Interestingly, some issues, which clearly illustrated the urban context, presented such as urban competitiveness, open space design, development of venues, landscape and green spaces and infrastructure are directly linked to the objectives embedded in the Sustainability Plan which must tackle or pursue it. The analysis is based on the different documents examined and the interviews conducted with the stakeholders involved in the case studies. Precisely, interviews are conducted with experts from subsequent fields: Urban and Land Use Planning, Open Space and Green Space Planning and Urban Engineering.

These interviews were focused on five questions, which were designed to get the first base information about the sustainability plan and the visions that were present previous of the mentioned plan and influenced it. These are the questions:

- Has the IOC’s sustainable plan set objectives in line with the sustainable policies of TMG?
- Does the IOC’s sustainable plan influence the plans of the territorial government of the neighbouring prefectures? In what way?
- Is the IOC’s sustainable plan influenced by some urban policies before the creation of the plan?
- Does the IOC’s plan present synergies and/or contrast with the territorialisation plan of Olympic Games and the local zoning plan?
- Is there already a management plan made by the TMG to implement further policies after the Olympic event?

5.1. Tokyo 2020 from the viewpoint of urban policy

Urban competitiveness and urban governance are interrelated and the pursuit of urban competitiveness will necessitate changes in urban governance; there is a great need to pay more attention to comprehensive competitiveness of cities to ensure economic, social and environmental sustainability (Shen, 2004). A comprehensive perspective on urban competitiveness and urban governance is required for policymaking. Tokyo tries, like other global cities, to reach the top of the global rankings for increasing its urban power which can help development in different fields. Some studies have been conducting on global ranking of the world's cities since 2008 (for instance Global Power City Index, GPCI, and the Mori Memorial Foundation Institute for Urban Strategies). Currently, in addition to the GPCI, dozens of other world city rankings have been published in various countries, as Cities of Opportunity made by PricewaterhouseCoopers (PwC) among others. In these reports, Tokyo was analysed using 70 indicators and was usually rated highly also in the sustainability issues with the peculiarity of different. Another fact is that Tokyo is both the most vulnerable city to natural disaster, but also the best prepared of the 30 cities here to meet its risks (PwC, 2016). The GPCI also serves as a benchmark for policy and is based on the government's KPIs (Key Performance Index) to raise Tokyo's current 4th place to 3rd place, and in Tokyo, with the goal of the government to make Tokyo the number one city in the year of the Olympics. So, how much will the 2020 Tokyo Olympics increase Tokyo's urban power? With the Tokyo Olympics as a booster, the number of foreigners living in and staying in Japan is expected to skyrocket in the future: the number of foreign visitors to Japan in 2020, which the Abe administration has proposed in its "Strategy for the Revitalization of Japan," also setting to be near to the goal of 20 million passengers. Besides, the Ministry of Land, Infrastructure and Transport's Civil Aviation Bureau has decided to increase the number of international flights to and from Haneda Airport from 90,000 per year to 130,000. Based on these facts and the reports, no doubt hosting the Olympic Games will become a driving force for Tokyo to increase its international competitiveness (Ichikawa, 2016).

Investment in Tokyo spread widely throughout Japan. Moreover, this is not limited to the time of the Olympics but is also due to the various economic activities that take place before the event. It will create an economic ripple effect that will propel Japan's economy upwards. Hence, how much of an economic impact will the 2020 Tokyo Olympics have on the Japanese economy? The Tokyo 2020 Olympic and Paralympic Bid Committee and the

Tokyo Metropolitan Government's Sports Promotion Bureau have announced the economic ripple effect, estimated to be about 3 trillion yen. The authors of Mori Memorial Foundation's Institute for Urban Strategies supplemented the Tokyo metropolitan government's estimate with a new assestment and, the economic effect was 16.4 trillion yen. If these figures are added together, the total economic effect would be more than 19.4 trillion yen in terms of induced production. This would have the effect of raising GDP by about 0.3% per year. It is said and documented that the economy will be in a slump after the Olympics. In countries that have over-invested, starting with infrastructure development, it is true such as Seoul, Barcelona or Athens (Ichikawa, 2016). However, in developed countries, where infrastructure development has already reached a certain level, there is no over-investment. For instance, London has taken the opportunity to host the Olympics and has grown by 2 in the GPCI every year and it is expected that Tokyo will follow the same behaviour. Hence, the policy implications of hosting the Olympics are clear. How the Tokyo government can boost the effects of hosting the Olympic Games and grow in their urban power? Undoubtedly, Tokyo government has high hopes for the smooth operation of the national strategic special zones as a policy to increase Tokyo's international competitiveness; the Abe administration is expected to implement regulatory and institutional reforms in a top-down approach to make Tokyo a world-class city. In December 2013, the National Diet enacted the National Strategic Special Zones Act intending to create an international city that can compete with the rest of the world, including the residential environment and create a centre for international innovation in medicine and other areas even through measures as a catalyst for growth and create the best business environment in the world. In the Tokyo metropolitan area, Tokyo, Kanagawa Prefecture, and the Narita Airport area were selected as national strategic special zones. Tokyo initially included nine wards in the centre of the city and later expanded it to 18 wards. The success or failure of the National Strategic Special Zones will depend on the extent to which they are deregulated. A hint of this can be found in the policy for considering deregulation of the national strategic special zones laid out by the Cabinet Office in June. The main targets for deregulation are health care, employment, education, urban renewal and development, agriculture, and historical. It is an evidence of given conditions of an international event with a limited timeframe which allow the implementation of policies that would otherwise be unworkable (Ichikawa, 2016).

5.2. Tokyo Olympic Games from the perspective of open space design

Tokyo Governor Shintaro Ishihara, who won four elections in 2011, was elected to the 31st Olympic Games in 2016. Undaunted by the failure of Tokyo's bid to host the 32nd Olympic Games (2020) and submitted his candidacy file (January 2013) to the IOC under his successor, Governor Naoki Inose. Finally, Tokyo was voted as the host city by the Buenos Aires IOC General Assembly (September 2013). Under the leadership of Tokyo's governor, the plan for the 32nd Tokyo Games is being urgently implemented.

The governor Ishihara established the Tokyo Plan (2000), in which the "circular megalopolis structure" (Figure 24) was announced. In detail, the Metropolitan Expressway and Central Ring Road (8 km radius) and the Tokyo Outer Ring Road (outer ring road, 15 km radius) were defined (Katagi, 2016).

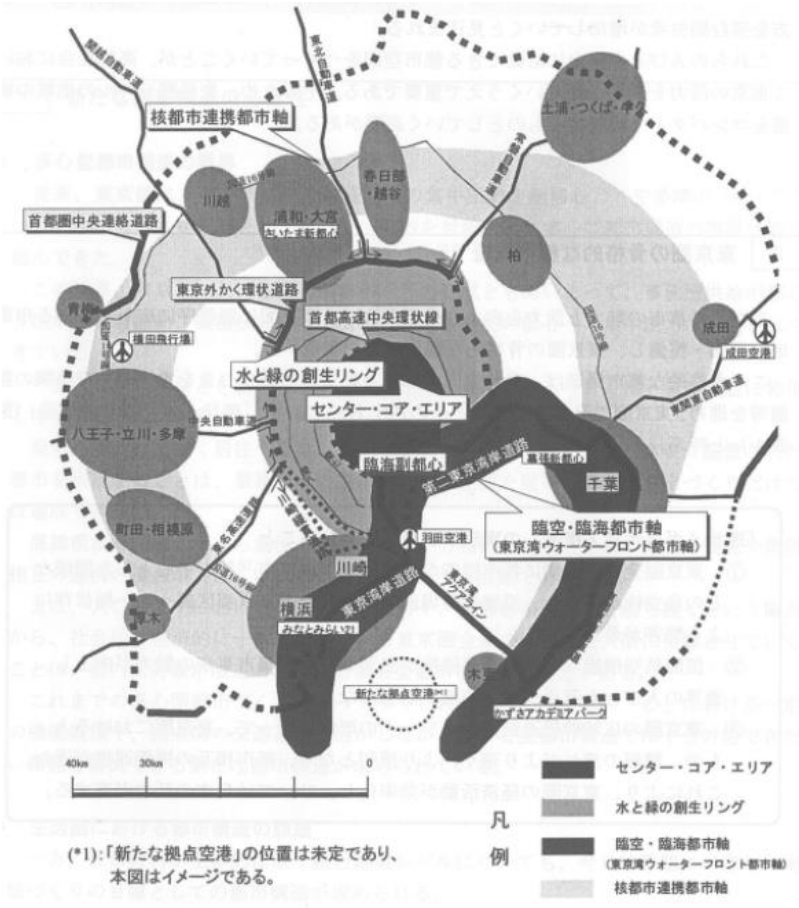

Figure 24. Tokyo Plan 2000: Towards a World City of Thousands of Visitors (Source: TMG, 2000).

It was planned to link the core of the city with the Tokyo Bay Waterfront Area, which was connected to the “Mizunote” area by the Metropolitan Expressway Bayshore Route.
The structure of the core city in the "Yamanote" area connected with the National Route 16 was designed following the Kanto Regional Plan and the First Metropolitan Area Development. The interconnectedness between satellite cities was promoted rather than suppressed as if to encourage the expansion of the mother city. The bipolar structure of "Yamanote" plus "Mizunote" is the result of Kenzo Tange's Tokyo Plan 1960 (Figure 25). It was also one of the first comprehensive attempts to reclaim Tokyo Bay, and sparked great enthusiasm in this new urban frontier in the following decades (Lin, 2007).

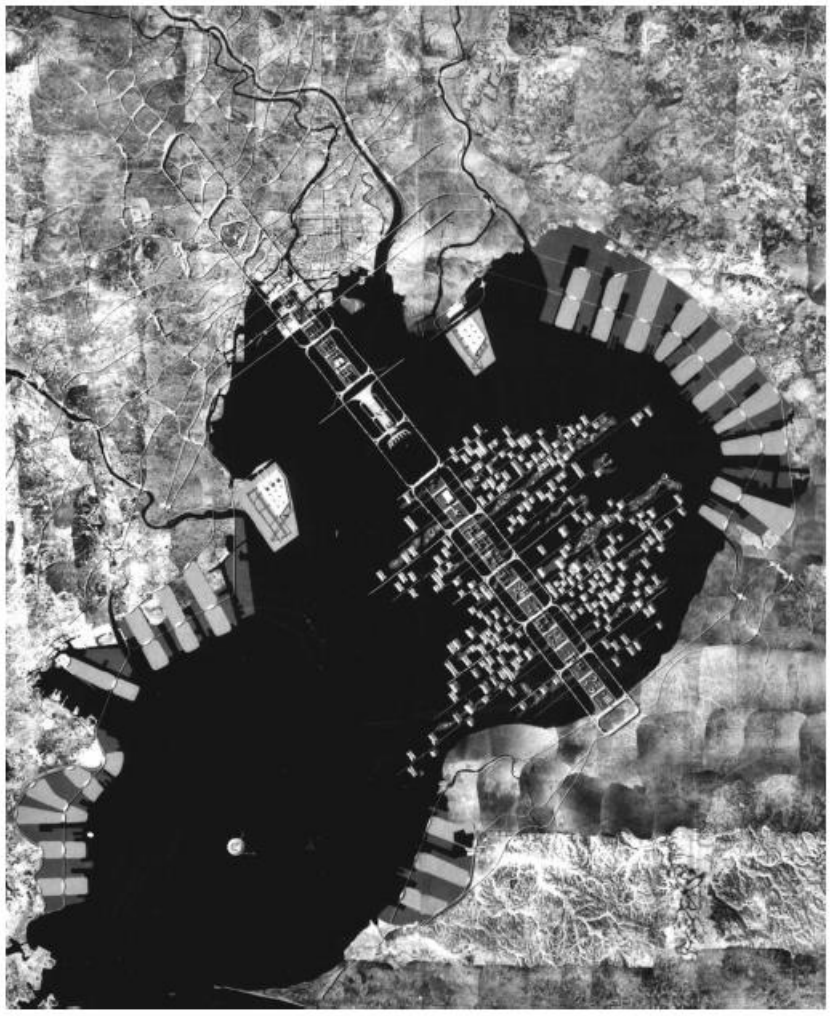

Figure 25. Plan for the urban reorganization of Tokyo by Tange Kenzo (Source: Lin, 2007).

In contrast, the Tokyo Plan 2000 connects two rings in different directions. The Tokyo Metropolitan Government's Second Long-Term Plan (1986), under the administration of

Shunichi Suzuki, added the seaside area to the Tokyo sub-centre of the city, and Tange Kenzo also proposed the Tokyo Plan 1986, which was based on the current conditions of the reclaimed land, rather than on the landless sea, and proposed a coastal submarine project. He led the organization of the World Urban Expo (1996), which encouraged urban development, but it was cancelled under Yukio Aoshima's administration.

The suspended waterfront sub-centre development was revived under Shintaro Ishihara's "Tokyo Plan 2000," which was part of the bid to host the Olympic Games in Tokyo. The 31st Candidate File for the Games (February 2009) and the 32nd Candidate File (January 2013) is divided into two zones: Heritage Zone and Tokyo Bay Zone (Figure 26).

As underlined through a personal interview by the author with an Urban and Land Use Planning expert, it has been possible understand synergies between basic land-use zoning and territorialisation plan which present the Heritage zone and Tokyo Bay Zone with the latter necessary due to the insufficient venues of the Heritage Zone which embraced 1864 Tokyo Games venues (Figure 27). Moreover, the site plan in the 32nd Convention Candidate File focuses on the "Tokyo Bay Zone," which is the area of reclaimed seaside land. In particular, the open spaces of the land, especially Yumenoshima Park and the "marine park" managed by the Tokyo Metropolitan Government's Bureau of Port and Harbor with various stadiums located within the park. The park was the "Olympic Stadium Proposal" was planned and designated as Edegawa Sports Park. The marine park and the stadiums to be built there will be connected by the Tokyo Bay Highway, and the greenway along it will be reclaimed land It is not a "park system" as it is divided into sections at each level of the road. The Tokyo Bay Coastal Road has been connected to the Central Loop Road to become a literal ring road, or the Tokyo Metropolitan Expressway (Katagi, 2016).

HERITAGE ZONE — □ ··· Olympic Games △ ··· Paralympic Games

1 **Olympic Stadium**
□△ Opening and Closing Ceremonies, Athletics
□ Football

2 **Tokyo Metropolitan Gymnasium**
□△ Table Tennis

3 **Yoyogi National Stadium**
□ Handball
△ Badminton, Wheelchair Rugby

4 **Nippon Budokan**
□△ Judo
□ Karate

5 **Imperial Palace Garden**
□ Athletics (Race Walk)

6 **Tokyo International Forum**
□ Weightlifting
△ Powerlifting

7 **Kokugikan Arena**
□ Boxing

8 **Equestrian Park**
□ Equestrian (Dressage, Eventing, Jumping)
△ Equestrian

9 **Musashino Forest Sport Plaza**
□ Badminton, Modern Pentathlon (Fencing)
△ Wheelchair Basketball

10 **Tokyo Stadium**
□ Football, Rugby, Modern Pentathlon (Swimming, Fencing, Riding, Laser-Run)

11 **Musashinonomori Park**
□ Cycling (Road)

TOKYO BAY ZONE

12 **Ariake Arena**
□ Volleyball (Volleyball)
△ Wheelchair Basketball

13 **Ariake Gymnastics Centre**
□ Gymnastics
△ Boccia

14 **Ariake Urban Sports Park**
□ Cycling (BMX Freestyle, BMX Racing), Skateboarding

15 **Ariake Tennis Park**
□ Tennis
△ Wheelchair Tennis

16 **Odaiba Marine Park**
□△ Triathlon
□ Aquatics (Marathon Swimming)

17 **Shiokaze Park**
□ Volleyball (Beach Volleyball)

18 **Aomi Urban Sports Park**
□ Basketball (3x3), Sport Climbing
△ Football 5-a-side

19 **Oi Hockey Stadium**
□ Hockey

20 **Sea Forest Cross-Country Course**
□ Equestrian (Eventing (Cross Country))

21 **Sea Forest Waterway**
□△ Rowing
□ Canoe (Sprint)
△ Canoe

22 **Kasai Canoe Slalom Centre**
□ Canoe (Slalom)

23 **Yumenoshima Park Archery Field**
□△ Archery

24 **Tokyo Aquatics Centre**
□ Aquatics (Swimming, Diving, Artistic Swimming)
△ Swimming

25 **Tatsumi Water Polo Centre**
□ Aquatics (Water Polo)

26 **Makuhari Messe Hall A**
□ Taekwondo, Wrestling
△ Sitting Volleyball

27 **Makuhari Messe Hall B**
□ Fencing
△ Taekwondo, Wheelchair Fencing

28 **Makuhari Messe Hall C**
△ Goalball

OTHER VENUES

29 **Tsurigasaki Surfing Beach**
□ Surfing

30 **Saitama Super Arena**
□ Basketball (Basketball)

31 **Asaka Shooting Range**
□△ Shooting

32 **Kasumigaseki Country Club**
□ Golf

33 **Enoshima Yacht Harbour**
□ Sailing

34 **Izu Velodrome**
□△ Cycling (Track)

35 **Izu MTB Course**
□ Cycling (Mountain Bike)

36 **Fuji International Speedway**
□△ Cycling (Road)

37 **Fukushima Azuma Baseball Stadium**
□ Baseball/Softball

38 **Yokohama Baseball Stadium**
□ Baseball/Softball

39 **Sapporo Dome**
□ Football

40 **Miyagi Stadium**
□ Football

41 **Ibaraki Kashima Stadium**
□ Football

42 **Saitama Stadium**
□ Football

43 **International Stadium Yokohama**
□ Football

Figure 26. Olympic Games Master Plan with the localisation of the Heritage and Tokyo Bay Zone (Source: Tokyo 2020, 2018).

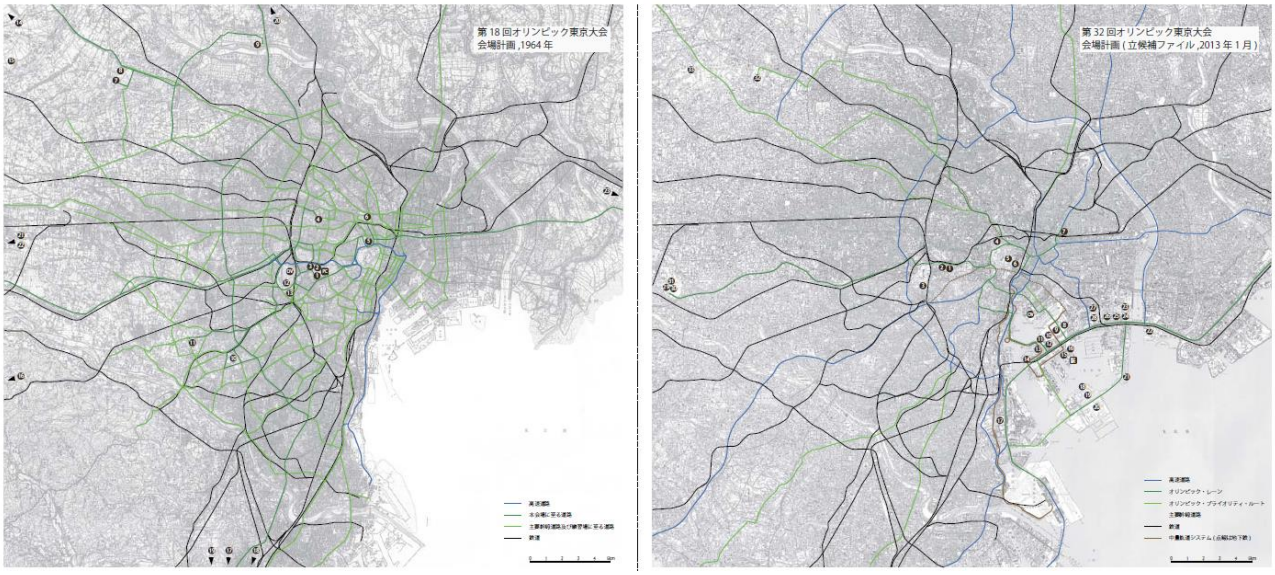

Figure 27. Heritage Zone based for 1864 Olympic Games on left and Tokyo Bay Zone on right (Source, TMG).

5.3. Development of Olympic Village and facilities made by TMG

The Tokyo 2020 Olympic and Paralympic Bid Committee submitted its candidacy file to the IOC in January 2013, in which the Tokyo Metropolitan Government is responsible for the development of 10 new permanent facilities and the expansion of 2 existing facilities, while the Organizing Committee and others are responsible for the other existing facilities and temporary facilities. The Tokyo Metropolitan Government has been re-examining the venue plan prepared at the time of the bid, to obtain the understanding of the people of Tokyo and to make it more realistic and appropriate, since June 2014. The three perspectives of the re-examination were what legacy can be left for Tokyo after the Games, what impact will it have on the lives of Tokyo residents at large, and how to address concerns about the rising cost of maintenance. In addition to reviewing the details of the facilities, three of the ten new facilities that the TMG was planning to develop were reconsidered by suspending the construction of new facilities and utilizing the existing facilities (Abe, 2016).

The three concepts of the new facility plan after the reconsideration are as follows. New two facilities (Ariake Arena and Musashino Forest Sports Plaza) will be established in the coastal area (Tokyo Bay) and the Tama area (Heritage Zone), respectively: establishing an arena to serve as a sports hub; boating, canoeing, hockey, archery, and various other sports. Then, provide a variety of outdoor sports venues for the city's residents to enjoy a variety of sports. As swimming is very popular in Japan and has many enthusiasts, it can be used for

a wide range of events from city residents to international competitions. The venue was developed in Tatsumi, which serves as a new base for the event. The venue for the cycling event was reported to and approved by the IOC Board of Directors in December 2015. Accordingly, Olympic Agenda 2020 was adopted at the IOC General Assembly in December 2014, and from the perspective of sustainability and long-term legacy, the direction of promoting the maximum use of existing facilities is strongly stated (Abe, 2016).

Oi Hockey Stadium, archery field (Yumenoshima Park), and Ariake Tennis Park were reviewed compared to the bid plan. In addition to the above, there have been consultations with each athletic organization and local government, and coordination with related parties on proposed changes to the facility layout has been generally order. The layout of the International Broadcast Center and the main press center has also been modified.

Of the seven new facilities to be developed by the Tokyo Metropolitan Government, the basic design of the Ariake Arena (Figure 28), Olympic Aquatics Center, and Uminomori Waterway Stadium was completed in August 2015, and in October 2015, the project was announced with the procedures for bidding contracts to begin and the contract to be signed by the end of the year.

Figure 28. Ariake Arena (Source: Tokyo 2020 Olympic Committee).

New facilities for canoeing and slalom (adjacent to Kasai Rinkai Park), Oi Hockey Stadium, archery (Yumenoshima Park), and renovation of the existing Ariake Tennis Park were

undertaken in 2015. The second phase of the project, the main arena, sub-arena and indoor swimming pool, was scheduled for completion in January 2017.

Furthermore, a place where athletes “feel at home” is needed, where they can focus on their competitions and it is one of the most important facilities for the Tokyo 2020 Games. The athletes' village for the Tokyo 2020 Games is in Harumi, Chuo-ku, Tokyo, and the residential building will be used to house the athletes. The plan is to use the building temporarily as a facility and then rebuild it as a residence.

In December 2014, the Tokyo Metropolitan Government announced plans to create a city where diverse people can interact and live comfortably. The basic concept of the proposed site for the athlete's village after the Games is "the residential building at the end of the athlete's village tournament” and is embedded in the so-called “Model Plan”.

Based on this model plan, the 2020 Harumi Smart City Group, which consists of 13 private sector companies, was selected in March 2015 as a "Project Collaborator" to promote procedures in the Environmental Impact Assessment Ordinance, the City Planning Law, and other laws and regulations, and to make the Athletes' Village an even more attractive place to live after the Games. This fact is clearer through a personal interview by the author with an Open Space and Green Space Planning expert, where was stressed the role of private companies which work closely near to the government even for the building of legacy objectives. In collaboration with these business partners, and examining post-Games legacy, and in December 2015, the Tokyo Metropolitan Government issued a report titled "Tokyo's Initiatives Toward 2020" ("Tokyo's Initiatives Toward Legacy"), which looked ahead to post-Games legacy.

In the spring of 2016, the project approval for the urban area redevelopment project will be obtained, and in the fiscal year 2016, a specific architect for the urban area redevelopment project will be selected through a public call for proposals, and the building will be developed using the vitality and development know-how of the private sector.

In the "Tokyo's Initiatives for the Legacy," the following clarifications were made regarding the development of Athletes' Villages. To make Athletes' Village a city that everyone can admire and want to live in after the Games, first, the sea should be front and centre. Improvement of waterfront space in the attractive space of Harumi, which is open and surrounded by greenery and where the city and nature are in harmony The city should be a place where people can enjoy water and greenery and a sense of relaxation and peace by ensuring a sense of unity in the continuity of greenery, roads, residences and waterfront spaces, and create a town that is open to the sea (Abe, 2016).

Also, by taking advantage of its location close to the city centre, the city will be able to attract a diverse range of people to live comfortably and to make it more vibrant. For example, the main street in the centre of Harumi will be the main street in the area and will be home to cafes, nursery schools, and other facilities that will make the area livelier. TMG will also develop a wide range of housing options to accommodate foreign businesspersons and the elderly. Various new needs in response to changing lifestyles will be satisfied using new technologies, such as advanced hydrogen energy. Besides, the use of new technologies, such as advanced hydrogen energy, allow TMG to create an environment friendly and sustainable town. Specifically, set up hydrogen stations to supply hydrogen for BRT and fuel cell vehicles. The realization of the supply system will serve as a model for the realization of a hydrogen society. Centred on the multi-mobility station, TMG aims to create a community that builds and nurtures people to realize eco-friendly mobility and sustainable development of the region (Figure 29).

Figure 29. Legacy of the athletes' village (Source: Tokyo's Initiatives Toward 2020, 2015).

To improve transportation accessibility and enhance access to the Bay Area, where the athletic facilities and athlete's village are located, the first step was improving water transportation and create a lively waterfront space through the construction of boat docks. For instance, in the athlete's village, TMG planned to build a pier in a convenient location close to the commercial building and terminal facilities. Besides, create green spaces and plazas along the waterfront and attract restaurants and other lively facilities.

In terms of transportation, the BRT will connect the city centre and the waterfront sub-center: will begin operating in 2019, and from 2020 onwards, the BRT will be fully integrated with the Athletes' Village in line with the development of the area after the Games.

In areas where demand for transportation is expected to increase, such as in the development of an athlete's village after the Games, TMG develop a multi-functional terminal facility that can be used by BRT, local buses and shared bicycles. Also, support the establishment of cycle stations for shared bicycles and other measures to improve the environment for bicycle use and increase the accessibility of the Bay Area.

Also develop the main trunk road framework, including the Loop Line 2, the Harumi Line of the Metropolitan Expressway, the Namboku Line of the Harbor Expressway, and the Port of Tokyo Tunnel waterfront section of National Route 357 (Figure 30).

As the host of the world's second Paralympic Games, Tokyo must leave behind a solid legacy for the Games by promoting both physical and mental barrier-free urban areas and creating a symbiotic society where people with and without disabilities respect and support each other. To this end, TMG promote barrier-free access within a one-kilometer radius around the Games venues and tourist sites, and complete the construction of barrier-free roads in the metropolitan area connecting the Games venues and the tourist sites, in preparation for the Games. Besides, the Tokyo2020 Accessibility Guidelines will be formulated in conjunction with the national government and the organizing committee to promote barrier-free access to the event venues and other related facilities and access routes, as well as the operation of the Games, including information dissemination and spectator guidance, and will be linked to the further promotion of the development of a city of universal design, to preserve the legacy of these ideas, and to make Tokyo a city that is comfortable for everyone to live in.

As further initiative, the Tokyo 2020 Olympic and Paralympic Environmental Assessment has been conducted as a voluntary assessment of the impact of the construction and

operation of the venues and facilities for the Games. The assessment includes environmental and socio-economic factors. Furthermore, an initial environmental impact assessment has already been carried out for all venues in the plan at the time of candidacy. Based on these ideas and considerations, "Tokyo's Initiatives for a Legacy" was created to present to the citizens of Tokyo what TMG will do and how will tackle it between the time of candidacy and the Games in as concrete and easy-to-understand a manner as possible, with the main purpose of encouraging them to get involved and participate in the Games.

It identifies eight themes, including the facilities and athlete villages, culture, education, environment, economy, and reconstruction of the disaster-affected areas, in anticipation of a legacy after the Games. In particular, the report focuses on leaving a legacy in the hearts and minds of the people, including volunteerism, the realization of a symbiotic society in the wake of the second Paralympic Games, and human resource development through education (Abe, 2016).

Figure 30. Development of the seaside transportation network by 2020 (Source: Abe, 2016).

5.4. Landscape architecture and green space issues in Tokyo

In accordance with the Grand Council Commitment No. 16 of 1873, it was decided that the city could not use the famous historical and landscape sites of the Edo period, or the recreational areas of the citizens, as parks of general public interest. The first two parks in Japan were Ueno Park and Asukayama Park in Oji. In 1888, Hibiya Park was designated as a park under the Tokyo City Ordinance of 1888, which aimed to create a modern, fireproof city. Born. After the end of the Meiji era, the Meiji Shrine Nai-Gaien was established. Motomachi Park and other areas were developed as part of the reconstruction project after the earthquake, and as the wartime atmosphere increased, the Tokyo Greenbelt Project was implemented to create a ring-shaped park. The greenery depicted in the painting was transformed into an air-proof green space. A few of these areas remained after the war and were developed as Mizumoto Park in the city centre and Kinuta Green Space in Setagaya. Children's parks and neighbourhood parks were created in various locations because of war reconstruction and zoning projects. The establishment and development of parks and green spaces had a strong connection to major national events; then came the 1964 Tokyo Olympics. It was also a national project that was expected to serve as a springboard for Japan's return to international society and rapid economic growth. The second venue was the Komazawa Olympic Park, which was newly developed, and the main venue, the National Kasumigaoka. The stadium was covered by the road to the point that the stands were illegal due to the additional number of spectator seats. Even though it is a scenic area, some facilities were built up after the Games. Yoyogi Park, where the Yoyogi National Stadium is located, is a former army training ground and is a green space designated for reconstruction. Part of the site has been used as an athlete's village, and today it is an Olympic site. It is used as a memorial youth centre and Yoyogi Youth Hostel. As will be discussed below, some point out that the Olympic Games were the light and shadow of a national event for the park; it is also an opportunity to implement and deliver the Green Master Plan (Koshimizu, 2016). The Basic Plan for Greenery, a statutory plan outlined in the Urban Greenery Law, is a comprehensive plan for the conservation of green space and the promotion of greening. The TMG also has a green city plan, which is systematically implemented. Several measures have been halted or project that is slow in progress. If this is the case, then the Olympics is a unique opportunity to strongly promote the measures outlined in the Green Basic Plan.

The TMG's green basic plan is currently under review, and an interim summary will be presented soon. Until 2016, as indicated in the "Tokyo in 10 Years," developed by the TMG in December 2006, list the green challenges that are supposed to be achieved in creating 1,000 hectares of new greenery, doubling the number of trees on the streets to 1 million, using all methods to preserve existing greenery. The measures include a greening plan system, strengthening the development permit system, promoting greening in existing buildings. The introduction of a system to assess the quality of the city's greenery, the preservation and networking of existing greenery, the turfing of schoolyards, urban parks and maintenance of marine parks, greening of waterfront areas, greening of ditches, preservation of farmland in urban areas, and use of productive green space. Moreover, conservation by the city, development of a green movement by various actors such as city residents and companies and enjoying greenery close to home.

A few administrative issues have been identified, including the spread of the lifestyle. It is important to review whether these measures have been fully deployed and achieved their goals and whether the measures have been effective. While this is necessary for the planning process the heat islanding of the city centre has become more pronounced and localized. The quality of life of the people who live and work in the city has become increasingly unstable, with frequent torrential rains. The situation is becoming less and less favourable, and Tokyo is lagging in global comparisons of urban power.

To improve the urban environment and create a beautiful cityscape, the city must be green. Hence, regeneration is the top priority for the Olympics and the post-Olympic period.

There is no doubt that this is an important issue for the Tokyo Green 2020 Promotion Council: this conference was held in conjunction with the Olympic and Paralympic Games to promote water and greenery as the core of the proactively work to rebuild green infrastructure to make Tokyo a green and nature-symbiotic city. The organization was established in September 2014 with nine green organizations to promote it. The idea was conceived by the head of the Machida Green Space and Environment Office of the Parks, Greenery and Landscape Division of the Ministry of Land, Infrastructure and Transport, who oversees the secretariat.

In the first forum, were introduced initiatives with the Olympics in mind. It was suggested that the Promotion Council should proactively aim to achieve this goal and that the marathon course should be the formation of a corridor of water, greenery and flowers on the axis. For the marathon race, which attracts the world's attention, the course is proposed to visit famous iconic spots in Tokyo. However, the thinking of the promotion Committee was about

how much of the environment can be improved around this downtown course. Lobbying related government agencies, roadside facility managers, and private businesses, as well as implementing maintenance projects; strong indication was reported of their willingness to participate as an initiative and aim to achieve this goal. As a specific method for environmental redevelopment, the planning of the Committee was to enrich the street trees, urban parks and cultural heritage parks to serve as hospitality spaces or restorative maintenance, greening of road structures and subway entrances, ad private building sites.
A second forum was held in April 2015, where spirited presenters presented the basic issues. They were presented and summarized as "five strategies" for advancing the creation of a green environment. In particular, the five strategies are summarized as follows:
- To formulate a vision for the future of Tokyo's greenery proactively and strategically, in coordination with various technical fields, and to develop a vision for the future of Tokyo. A comprehensive long-term green plan for the whole of Tokyo has been formulated with attention to the details, and the plan will be implemented to lead the way to the future.
- To present a vision for the future of greenery to improve the asset value of Tokyo and other Japanese cities to society and the world appeal. Greenery is talked about as a theme of the city, not as a part of the city.
- The development of landscape initiatives. Not just decorative flowers and greenery for hospitality and events as a place of celebration, but leaving specific green benchmarks by 2020, and as a foundation for a culture of living beyond 2020.
- To build a framework for promoting the greenery such as diverse range of greens that have a cultural, livelihood, ecological and style effect on the 2020 legacy.
- Continuously maintain a framework that continues to be created and preserved as healthy lifestyles that foster physical and mental health, from children to the elderly, through sports. It will be realized as a lifestyle culture that includes food (agriculture). It combines a green environment with a sports lifestyle, making it easy for everyone to participate. The goal is to create an urban environment that achieves a lifestyle (Koshimizu, 2016).

The third forum was held in November 2015. After the last Olympic Games, Tokyo suffered a continuous loss of natural, historical and cultural space. Therefore, the aim to rebuild the landscape, and to create an urban structure with water and greenery was needed. The case study was Yoyogi Park, which he was involved in as part of his work for the Tokyo Metropolitan Government. The site is an urban planned green space determined by the War Reconstruction Agency's Notification No. 14 of 1946. During the Olympics, it was decided

by the Cabinet that the area would be used as an athlete's village and after the Games, it would be developed as a forest park. However, despite the pressure of urban infrastructure development, the forum has been able to preserve the area as a green space. It was pointed out that it was fortunate that it was an integrated planning area with the Meiji Shrine and that it was government-owned land. Still, the Jingu-gaien Garden, although a scenic area, was designated as a “redevelopment promotion zone”, “roadside redevelopment promotion zone”, and a “redevelopment of the area”. The facilities can and should be maintained in harmony with nature and the environment, for example through district planning.

It is notable that the Olympics will change mature urban structures. If we look at the layout of the venues, the Olympic Games so far can be divided into two main categories: the centralized layout of facilities such as Atlanta, Los Angeles and Mexico City, and the decentralized layout of venues in London, Beijing and Mexico City.

The former is more of a centralized facility arrangement, such as Sydney, as it might infer from the name of the host city. A somewhat older type of plan, the latter being a more recent one: the 1964 Tokyo Games will be held in Tokyo, with cycling, shooting, and Because the sailing and canoeing events were held at venues far from the city centre due to the nature of the competition, there was an intermediate type of multipolar concentration It can be described as a distributed arrangement. A similar arrangement was seen in Barcelona in 1992, but the difference with Tokyo is that even before the Games, the embryo was a community-level environment that was beginning to change. The residents' activities for the improvement of the environment were very active, and the movement of a group of experts to support them was the Olympic Games. The point is that it blossomed at once with the implementation of the first two years and guided the direction of subsequent urban strategies. While the previous Tokyo Games were on the path of rapid economic growth, the Barcelona Games were a movement in market principles. A radical restructuring of the urban structure was conceived and carried out with a focus on the redevelopment of hard-to-reach areas. In the decentralized London Games, where the Games were held in and around the Elizabeth II Olympic Park, this Green infrastructure in an area where the area was expected to be regenerated by the London Plan in the 2000s, and green infrastructure was seen as an integral part of the strategic network of the plan, called East London Green Grid, a sustainable, pedestrian-separated, sustainable plan that sews the city centre and parks. The green travel of the world's largest transportation system was realized. The urban policy concept underlying this green plan was the enhancement of social inclusion, with the improvement of welfare, education, housing and enjoyment of life (Koshimizu, 2016).

The Tokyo 2020 Games are more decentralized than in the Bid Plan, but with the theme of a compact Olympics is a centralized arrangement of the city's inland through the Heritage Zone and the Bay Zone on the waterfront. Rather than ending up with large scale events and decorative pomp and circumstance, Tokyo lacks a sporting Culture and art, urban parks and cityscapes are supplemented by the Olympic Games to create a mature society. The question is whether the city can be transformed into a city where people can enjoy the richness of the world. The urban structure theory of the previous Olympic era, which was based on roads and railways, has been replaced by the urban structure theory of the year 2020, which is based on water and greenery. Inland, a green revitalization plan is presented in the urban remodelling redevelopment projects underway in various parts of the city. Starting from Umi-no-Mori (Forest of the Sea), it is one of the most popular tourist attractions in Tokyo, including Odaiba, Harumi, Tsukiji, the Imperial Palace, Shinjuku Gyoen and Meiji Jingu Shrine. A plan is underway to establish a green network by connecting large-scale green spaces with street trees and tree planting strips. This continuous greenbelt will function as a "wind path" that leads the wind from the sea to the interior of the city, and it will be cooler than the inland. It is hoped that the wind from the "wind" will have the effect of reducing the heat island effect in the city centre (Figure 31).

Figure 31. Green network from the seaside area (Source: Koshimizu, 2016).

The “wind path” is a result of the Tokyo Metropolitan Government's port plan which calls for the expansion of water, greenery and biological habitat networks as well as the preservation of history and culture. In the seaside area, the city promotes the creation of places where people can enjoy nature and the maintenance of spaces that ensure the unity of land and sea. In the seaside area, the plan calls for the creation of parks that are actively hydrophilic and friendly to nature, such as the seaside park and Futo Park. A greenway park and other projects are underway to connect the two. Recently, a variety of actors have been working, also through the participation process, to create a forest that serves as the starting point for the Wind Road and serves as a resource recycling facility.

In the run-up to the Olympics, TMG wants to intensify impulse for the Marine Park with green pedestrian and bicycle lanes: the idea is to connect them circularly by road. This is where self-propelled walking aids like the Segway and motorized wheelchairs and other practical vehicles can be used creating a special zone for free movement. An amphibious vehicle network will operate between the port of Tokyo and the Olympic venues without waiting. The TMG has set a goal of reviving Tokyo as a beautiful city surrounded by water and green corridors (Koshimizu, 2016).

6. THE CASE OF THE TOKYO SUSTAINABILITY PLAN

This last chapter introduce the Tokyo sustainability plan proposed by the IOC analysed in the same way of the above plans of London and Rio. The relevant difference is related to the currently situation of the Olympic Games which were postponed due to the spread of COVID-19. Undoubtedly, the reports, the plan and the tools linked are influenced in a significant manner. As introduction of the section, a debate about the Tokyo Olympic Games matter between the different stakeholders is provided.
The scenario related to modifying existing operational plans due to the dramatic increase in cases and new outbreaks of COVID-19 for the Games to go ahead on 24 July 2020, and also for changes to the start date of the Games was proposed by the IOC president Thomas Bach through the following statements:

"*…This step will allow for better visibility of the rapidly changing development of the health situation around the world and in Japan. It will serve as the basis for the best decision in the interest of the athletes and everyone else involved*".

Therefore, further to the study of different scenarios, it was needed the full commitment and cooperation of the Tokyo 2020 Organising Committee and the Japanese authorities, and all the International Federations (IFs) and National Olympic Committees (NOCs). It was also required commitment from, and collaboration with, the Rights-Holding Broadcasters (RHBs) and TOP Partner sponsors, as part of their continued and valued support to the Olympic Movement, as well as cooperation from all the Games' partners, suppliers and contractors. It is in the character of the Olympic stakeholders' shared commitment to the Olympic Games and considering the worldwide deteriorating situation, that the IOC had initiated the next step in the IOC's scenario-planning at the date of 22 March.
The IOC will, in full coordination and partnership with the Tokyo 2020 Organising Committee, the Japanese authorities and the Tokyo Metropolitan Government, started detailed discussions to complete its assessment of the rapid development of the worldwide health situation and its impact on the Olympic Games, including the scenario of postponement.
Another scenario evaluated was linked to the cancellation of the Olympic Games: alternative proposed by the IOC but not supported from the Japanese side. About it, Shinzo Abe said:

"*If the IOC's decision means it becomes impossible to hold the Olympics in a complete form then a decision may have to be made to postpone them*".

According to the last thinking of the Japan Prime Minister and in response to the global coronavirus pandemic, the decision to postpone the Olympic and Paralympic Games Tokyo 2020 to 2021 was taken on 24 March 2020. IOC President Bach and Prime Minister Abe expressed their shared concern about the worldwide COVID-19 pandemic, and what it is doing to people's lives and the significant impact it is having on global athletes' preparations for the Games. The two leaders praised the work of the Tokyo 2020 Organising Committee and noted the great progress being made in Japan to fight against COVID-19. The unprecedented and unpredictable spread of the outbreak has seen the situation in the rest of the world deteriorating. One day before, the Director-General of the World Health Organization (WHO), Tedros Adhanom Ghebreyesus, said that the COVID-19 pandemic is "accelerating". In the present circumstances and based on the information provided by the WHO, the IOC President and the Prime Minister of Japan have concluded that the Games of the XXXII Olympiad in Tokyo must be rescheduled to a date beyond 2020 but not later than summer 2021, to safeguard the health of the athletes, everybody involved in the Olympic Games and the international community. The leaders agreed that the Olympic Games in Tokyo could stand as a beacon of hope to the world during these troubled times and that the Olympic flame could become the light at the end of the tunnel in which the world finds itself at present. Therefore, it was agreed that the Olympic flame will stay in Japan. It was also recognised that the Games will keep the name Olympic and Paralympic Games Tokyo 2020. On 30 March 2020, it was announced that the new dates for the Tokyo 2020 Games would be from 23 July to 8 August 2021 for the Olympic Games and from 24 August to 5 September 2021 for the Paralympic Games.

6.1. The discourse of the plan

According to the Sustainability Plan, Tokyo and Japan are an advanced city and country respectively in pioneering problem-solving initiatives directed at establishing a sustainable society. In these years, the world's attention was on the Tokyo 2020 Games, which have been a major impetus for sustainability efforts. The organisers of the Games, including officials who organised the bid for the Tokyo 2020 Games and the Tokyo Organising Committee of the Olympic and Paralympic Games (Tokyo 2020), have consistently placed the value of the sustainability of the Tokyo 2020 Games, both during the bid before the host city was announced in 2013 and during the initial stage after the announcement (specifically, the stage during which the Tokyo 2020 Games Vision and the Basic Plan were established). In 2014, the IOC identified three inter-related pillars (credibility, sustainability, and youth) for the Olympic Agenda 2020, committing to "include sustainability in all aspects of the Olympic Games and within the Olympic Movement's daily operations" (IOC, 2017). The 2030 Agenda for Sustainable Development (effectively decoded in SDGs) put forth by the United Nations in 2015 recognises that sport is an important driver of sustainable development. In response, the IOC addressed how it would contribute to the 2030 Agenda and SDGs concretely in the IOC Sustainability Strategy, which was issued in 2016. Tokyo 2020 is aware of the role that society expects the Tokyo 2020 Games to play. Through the Games, in line with the sustainability concept of the Games "Be better, together – For the planet and the people", Japan and Tokyo presented to the world an integrated vision of how 21st-century sustainable development can be pursued in the environmental, social, and economic spheres, and in that way, the Games will contribute to the 2030 Agenda and SDGs. The three pillars of the 2020 Tokyo Games Sustainability Strategy are minimal environmental burden, urban environment plans harmonising with nature and a sustainable city through sport. The Tokyo 2020 Games Vision will be passed on to future Olympic and Paralympic Games, including the Paris Games and the Los Angeles Games, to future mega sports events, as well as to a broader audience in Japan and the world as the legacy of the Tokyo 2020 Games, reflecting the organisers' desire that this legacy grows and develop in a diverse and varied manner (Tokyo 2020, 2019).

Interestingly, and as highlighted by the Sustainability Progress Report (2019), is explained the duties of the Urban Planning and Sustainability Committee which play a role that in the previous events was not specified in deep. Chiefly in to offer advice on Tokyo 2020's

sustainability initiatives from an expert perspective. People from all levels of society, including experts and specialists, participate in the Committee's deliberations both directly and indirectly to improve sustainability initiatives at the Games. The Tokyo 2020 Games will have a major influence on the awareness and conduct of people in Tokyo, Japan, and the world. It is imperative for Tokyo 2020 that the Games have a positive impact on the environment and society and that this impact remains in the form of a positive legacy. Ensuring that the Tokyo 2020 Games help effect a transformation to a sustainable society for which humankind longs is not the exclusive role of Tokyo 2020 and other organisers and officials, but indeed of all those who have played a part in the process or experienced the years of preparations leading to the Games. Numerous people with a shared awareness of this imperative – which is to say, stakeholders who are involved in a variety of capacities, both directly and indirectly – are working to achieve that goal. Thus, Tokyo 2020 recognises the importance of dialogue and collaborative action with those stakeholders, and organisationally it has put in place structures to ensure they can participate in the planning for, preparation for, and delivery of the Games.

One of the relevant stakeholders is the Urban Planning and Sustainability Committee which was established in June 2015 to address issues related to urban planning and sustainability. Its current membership of 27 people representing various fields discusses specific actions and the legacy of the Games in terms of topics such as urban spaces that are easy to use for all, the accessibility of venues and surrounding areas, and the sustainable delivery of the Games. The Committee has created a Sustainability discussion Group to study specific actions and projects that consider sustainability at the Games as well as multiple working groups to foster expert discussion on an array of topics and domains related to sustainability. A range of stakeholders participates in discussions, including members, observers, special committee members who participate as necessary, and providers of specialized information with the assurance of transparency through the participation of media and the publication of reports in the site of Tokyo 2020. As a result, it is not unusual for the discussion process to yield differences of opinion and interpretation as participants work to formulate specific plans and establish standards and goals. Nonetheless, the discussion is serious and constructive since all participants share the same goal of contributing to sustainability, and the results are apparent in the Sustainability Plan and the Sustainable Sourcing Code. In that sense, the track record of, and progress in, initiatives reported in this Sustainability Progress Report are the results of a cooperative effort involving Tokyo 2020, other officials, the members of various committees, and the public. At last, initiatives involving the sustainability of the

Games are entering the operational phase based on the Sustainability Plan mentioned above. The members of the Urban Planning and Sustainability Committee will continue to be actively involved in the Tokyo 2020 Games to ensure their sustainability while helping to build a sustainable society for the future based on their respective areas of expertise and as representatives of the many stakeholders of the Games and the general public (Tokyo 2020, 2019).

Overall, the Plan aims to:

- Specify the Tokyo 2020's recognition of the relationship between the delivery of the Tokyo 2020 Games and sustainable development and how Tokyo 2020 intends to contribute to the United Nations SDGs through the delivery of the Games,
- Set out policies, goals and measures for Tokyo 2020, delivery partners[6] and other parties involved in the Games to take for sustainable Games planning and operations,
- Provide information related to sustainable planning and operations of the Tokyo 2020 Games for various people who are interested in the Tokyo 2020 Games to communicate with those involved in the Games,
- Become a learning legacy that will be used for sustainable Olympic and Paralympic Games planning and operations by those involved in the future Olympic and Paralympic Games,
- Be referred to and used by people in Japan and the world to pursue approaches to sustainable development (Tokyo 2020, 2019).

6.2. Objectives and strategy

Tokyo 2020 identified five main themes for prioritising sustainability in the Games. These themes were selected considering global trends, such as the aforementioned SDGs, to make the Games a positive force for solving leading social issues. Like the SDGs, these themes are interconnected, so the implementation of these themes follows a holistic approach that takes environmental, social, and economic factors into account (Tokyo 2020, 2020). Tokyo 2020 focuses on five different themes as illustrated in the following image

[6] The Government of Japan, prefectural/municipal governments and private organisations that provide financial and other support towards the planning and delivery of the Games

(Figure 32). The purpose of the section will be analysing three themes as following: climate change, resource management and natural environment and biodiversity.

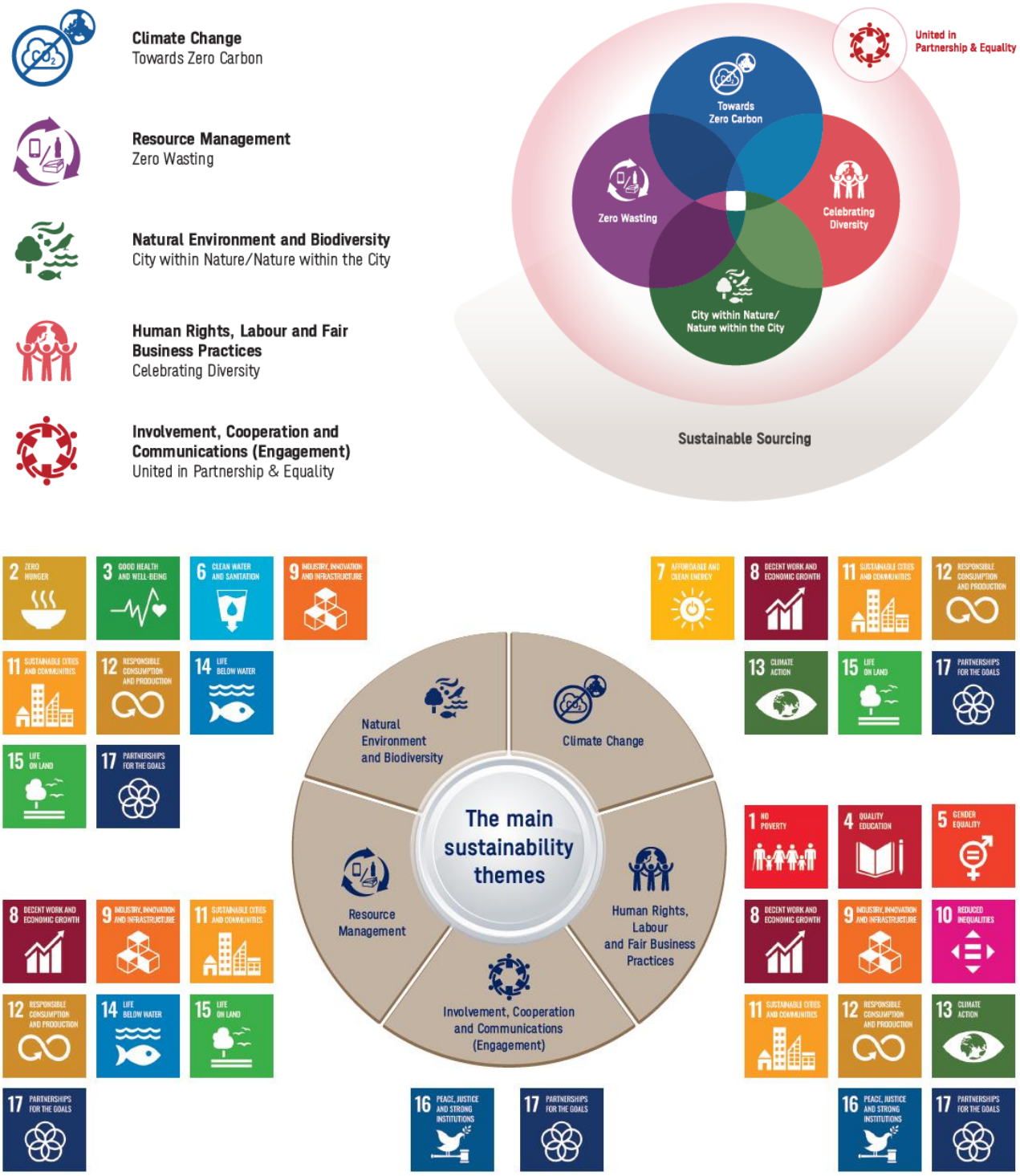

Figure 32. The five main sustainability themes and the related SDGs concerned (Source: Tokyo 2020, 2020).

6.2.1. Climate change: Towards Zero Carbon

According to the Fifth Assessment Report released by the Intergovernmental Panel on Climate Change (IPCC) in November 2014, "…without additional mitigation efforts, by the end of the 21st-century global warming will lead to a high to very high risk of severe, widespread and irreversible impacts globally". Besides, the Paris Agreement was adopted at the 21st Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change in December 2015. This agreement sets out the international legal framework for initiatives aimed at the reduction of carbon dioxide and other greenhouse gases from 2020 for all contracting states. In response to this, the Organising Committee steered into consideration climate change issues and make efforts to minimise carbonisation as an integral part of its preparations for the 2020 Games. This goal represents the intention of Tokyo 2020 and delivery partners to manage the Games focusing on maximum energy savings and use of renewable energy, and thereby to together create the foundation for a decarbonised society. Summary, measures include using existing venues as opposed to constructing new ones, reducing energy use by venues, using power from renewable energy in operations, and promoting the use of transport with a low environmental impact, for example through the use of public transportation and fuel cell vehicles (Tokyo 2020, 2019). The Organising Committee considered the following points to help reduce greenhouse gases that cause climate change:

- Setting specific reduction targets and utilizing Japan's advanced energy-saving technologies
- Strategic management measures for the reduction of greenhouse gases estimated to be emitted through Games planning and operations (low carbon management)
- Proper accounting of emissions of greenhouse gases (measuring and monitoring of emissions)
- Proper choice of avoidance and/or reduction measures for estimated emissions of greenhouse gases, considering the effects and significance of the measures
- How to deal with the remaining emission of greenhouse gases unavoidable even after the above measures have been taken (carbon offsetting, etc.)
- Measures to mitigate the effect of the urban heat island phenomenon, sudden torrential and downpours (Tokyo 2020, 2016).

According to the Sustainability Plan (2018), the Organising Committee established twelve targets as follows:

- Target 1 - Strategic venue planning to fully use existing venues and public transport networks: in addition to the use of existing venues such as Yoyogi National Gymnasium and Nippon Boudican which were the main venues in the 1964 Tokyo Olympic Games, the revised venue plans will ensure the use of existing facilities in about 60% of all venues (25 out of 43 venues), which means the reduction of approximated 80,000 t-CO2.

- Target 2 - Ensuring high environmental performances in the construction of venues: the emission of CO2 will be avoided through the selection of environmentally friendly construction materials and the use of environmental technologies, the use of passive design using natural effects such as natural lights and ventilation at five new permanent venues, the use of recycled materials (e.g. concrete made with recycled aggregates and recycled crushed stones) and friendly materials (e.g. timbers produced in Japan)

- Target 3 - Maximum procurement of materials and goods with high environmental performances: upon procurement of materials and goods, ones with lower CO2 emissions are selected to satisfy environmental laws, regulations, policies, and guidelines.

- Target 4 - Construction of venues by effectively using energy-saving technologies: improvement of energy efficiency in additionally constructed permanent venues in the entire buildings by actively using functions and technologies with lower environmental loads, ensuring the maintenance of Rank S performance in Comprehensive Assessment System for Built Environment Efficiency (CASBEE) at three new permanent venues and acquisition of Level 3 in the Green Building Program of the Tokyo Metropolitan Government at seven new permanent venues with more than 2,000 mq of total floor area

- Target 5 - Maximum use of facilities and equipment with high energy efficiency: reduction of CO2 emissions through the effective installation of efficient and high-energy-performance facilities and devices, from torches used in the Torch Relay and those from the relay caravan, through the production of uniform for the staff of the Games concerning accommodation for those involved in the Games, via the promotion of energy-saving and encouraging caterers to select environmentally friendly and energy-saving devices and equipment

- Target 6 - The implementation of energy management in venue operations, and the installation and use of Building and Energy Management System (BEMS) in new permanent venues: promotion of proper energy management in the operation of the Games by using BEMS at four new permanent venues, reduction of the energy consumption by controlling the use of lighting and air conditioners at workforce areas and other areas

- Target 7 - Reduction of CO2 emissions through the maximum recycling of materials and goods: materials, goods and devices used in the Games must be procured through rental/lease schemes as a basic rule.

- Target 8 - Promotion of transport with lower environmental load: guarantee the maximum use of public transport (implementing travel demand management initiative - TDM) and the use of low-pollution and fuel-efficient vehicles in the Games, promotion of the use of public transport, use of environmentally friendly vehicles such as hybrid vehicles and fuel-cell vehicles, reduction of environmental loads such as CO2 emissions through various efforts including the promotion of eco-driving through rigorous awareness-raising campaigns, the practice of eco-driving in the transport of goods and materials associated with the Games and the provision of efficient transport routes and the reduction of the total volume of vehicle traffic through traffic demand management and the realisation of the smooth traffic environment

- Target 9 - Maximum reduction of greenhouse gases (GHG) besides CO2 (e.g. HFCs): purchase of devices which run with non-Fluorocarbons (natural refrigerant) and proper prevention of the leakage of Fluorocarbons upon the removal of used refrigeration and air conditioning devices

- Target 10 - Installation of facilities which use renewable energies in new permanent venues: facilities such as solar power systems and geothermal energy systems at permanent venues

- Target 11 - Maximum use of renewable energy: renewable energies are going to be used as the electricity used in the operation of the Tokyo 2020 Games as much as possible through the renewable grid electricity and the purchase of Tradable Green Certificates and the possibility of using renewable energies as fuels is also explored in cooperation with stakeholders

- Target 12 - Implementation of offset for CO2 and other greenhouse gases which are inevitably emitted even with the implementation of avoidance/reduction measures of emissions: the CO2 and other greenhouse gasses emitted through the Games which cannot be eliminated through the implementation of measures greenhouse gasses are offset using carbon credits which match with the concept of offset for the Tokyo 2020 Games. Furthermore, activities to improve awareness toward climate change and actions to reduce future emissions will be promoted through the participation and cooperation of various organisations and groups (Tokyo 2020, 2018).

6.2.2. Resource management: Zero Wasting

Among the 17 Sustainable Development Goals (SDGs) adopted at the UN Summit in September 2015, Goal 12 is to “Ensure sustainable consumption and production patterns.” Specifically, it aims to achieve sustainable management and efficient use of natural resources, halve per capita global food waste, and substantially reduce other forms of waste by 2030. As preparations for the Tokyo 2020 Games will require the procurement of a large number of materials within a short time, the Organising Committee will work on resource conservation and recycling, encourage maximum use of the 3Rs (reduce, reuse and recycle) while ensuring only products and services that are vital to the Games are used. The Organising Committee will consider the following points for resource management:

- Setting specific targets to utilize Japan’s advanced technologies, and encourage widespread use of the 3Rs

- Strategic management measures for resources conservation and recycling, and proper disposal of waste through Games planning and operations

- Measures for estimation and monitoring of waste generation

- Procurement measures that take into account resource efficiencies such as the reduction in the use of virgin materials and resource recycling

- Promotion of easy to understand waste separation methods and widespread acceptance and practice of these methods (Tokyo 2020, 2016).

The Tokyo 2020 Games conducts resource management by all, aiming to put a stop to deforestation and land devastation caused by resource exploitation as well as to eliminate environmental load caused by waste, based on utilising resources without any wasting throughout the supply chain. Use of recycled and renewable sources will be encouraged and promoted. Procured items and goods will be reused or recycled through rentals and leases. Wastes generated through the operations of the Games will be reused or recycled as well (Tokyo 2020, 2019).

As argued by the Sustainability Plan were established ten targets as follows:

- Target 1 - Reduction of the edible part of food waste (reduction of the generation of food loss): are required efforts to forecast the amount of food and drinks to serve using ICT and other technologies, adjustment of the volume to be served such as portion control, awareness-raising targeting athletes and the Games staff about the importance of reducing edible part of food loss and measurement of food wastes and visualisation of the amount

- Target 2 - Reduction of packaging materials: aim to the reduction of the use of packing and packaging materials and disposable containers through the cooperation with sponsors, licensees and suppliers, to encourage the staff of the Games and spectators to reduce containers and packaging materials and finally gathering of data such as the number of containers and packaging wastes generated

- Target 3 - Reuse or recycle of procured items and goods (use of rentals and leases, reuse after the Games): reduction of the production of new items and goods through the use of rentals in procurement, use of rentals and leases as much as possible and the promotion of sharing, the pursuit of reuse and recycling of purchased items by strategically securing those who would use the goods after the Games such as by reselling them or cooperating with the national government, local governments, and sponsors

- Target 4 - Use of recycled materials: through encouraging the use of recycled materials in constructions and procured items and goods and the identification of the amount used and actual values, use of recycled materials in Games staff uniform and the exploration of the implementation of horizontal recycling of PET bottles

- Target 5 - Use of recycled metal in medals of the Games: via the Tokyo 2020 Medal Project

- Target 6 - Reuse or recycle of wastes generated from operations of the Games: reuse and recycling of wastes generated through the operations of venues and the Olympic/Paralympic

Village, promotion of the participation of many stakeholders by calling for spectators to cooperate with waste segregation and reuse and recycling of dishes

- Target 7 - Recycle of food waste: through proper segregation of food wastes and recycling of all food wastes generated from venues such as the dining halls of the Olympic/Paralympic Village

- Target 8 - Reuse or recycling of construction wastes: maximum efforts to realise the above targets at temporary venues and overlays

- Target 9 - Sustainable use of renewable resources (e.g. Timbers): actively using of timbers in “Operation BATON Building Athletes’ village with Timber Of the Nation” and utilising of timbers used in the Games at various regions as the legacy of the Tokyo 2020 Games and the promotion of the use of renewable resources including timbers at facilities in venues

- Target 10 - Reduction of emissions into the environment: the avoidance of the landfilling of wastes generated in association with the games through the above measures and the identification of the number of wastes landfilled with the estimation of the number of CO2emissions from wastes in cooperation with climate change mitigation measures (Tokyo 2020, 2018).

6.2.3. Natural environment and biodiversity: City within Nature/Nature within the City

In Tokyo as well as other cities in Japan, the natural environment such as existing green spaces and rivers, and the green and waterside environment newly created by humans have been mixed. According to the Venue Master Plan, the Heritage Zone of the Tokyo 2020 Games consists of many facilities used as competition venues used in the 1964 Tokyo Olympic Games as well as worthy nature with historic values such as the Imperial Palace, Meiji Shrine, and Shinjuku Gyoen National Garden. Instead, the Tokyo Bay Zone extending at the coastal area of Tokyo consists of many marine parks such as Odaiba Marine Park and Kasai Kaihin Park constructed on landfill sites developed after around 1900. Not only governmental agencies, but also private companies, local communities, and individuals have participated in the maintenance and production of greenery and the water environment

in Tokyo. In the Tokyo 2020 Games as well, the stakeholders aim to implement measures involving diverse bodies to realise a comfortable urban environment which exists in harmony with nature. These efforts would contribute to the realisation of a model of a new mature city in which the activities of citizens would improve the urban environment which would keep developing into the future (Tokyo 2020, 2018).

The year 2020 is also the final year of the Aichi Targets adopted at the Tenth meeting of the Conference of the Parties to the Convention on Biological Diversity (COP10). The Aichi Targets aim at the realization of “living in harmony with nature” by 2050, and “taking effective and urgent action to halt the loss of biodiversity” by 2020.” For the Tokyo 2020 Games, biodiversity issues, and water and greenery-related issues are acknowledged, which are all closely interlinked. The Organising Committee consider the following points for the natural environment and biodiversity:

- Setting water, greenery and biodiversity-related targets

- Measures for mitigation and monitoring of impacts on the water environment (water quality and water resources), atmospheric environment, soil environment and the ecosystem, related to Games planning and operations

- Measures for the conservation and creation of biodiversity, taking into account connectivity and measures for controlling invasive alien species

- The utilisation of the waterside environment and securing of the quality and quantity of greenery

- Measures to mitigate the effect of the urban heat island phenomenon using water and greenery (Tokyo 2020, 2016).

Glancing ahead to the legacy, the Organising Committee will pursue to restore and form a rich ecological network through the Games and contribute to the creation of a new urban system that will improve comfort and resilience. The Games will make effective use of water resources through the cyclical use of rainwater at venues. Also, an ecological network will be created while working to ensure harmony with the surrounding greenery, for instance by considering how to preserve existing trees and by a process of greening venues with native

species. Besides, Tokyo 2020, the Tokyo Metropolitan Government, and involved ministries and agencies will work together to implement measures to address heat (Tokyo 2020, 2019).

As stressed in the Sustainability Plan, there are three targets that the bodies involved must follow:

- Target 1 - To minimise the environmental load of the Games and improve the functions of water circulation in the city while improving the comfort of the urban environment through:

- Heat management in venues: planning of the reduction of thermal load on buildings such as blocking heat on outer walls, installation of effective air conditioning methods, and the use of shades such as tents and lean-to for people waiting in line to enter facilities

- Roadside events: installation of solar heat-blocking pavement on prefectural roads within main areas such as Centre Core Area by 10 km every year and 136 km in total by 2020

- Consideration toward chemical substances, atmosphere, and soil in the Games: implementation of the Tokyo 2020 Olympics and Paralympics Environmental Assessment, investigation and preventive measures based on the Soil Contamination Countermeasures Act, promoting the use of public transport and low-pollution and fuel-efficient vehicles, use of low-emission and low-noise type construction machinery

- Consideration toward water circulation in the Games: effective use of water resources through the installation of filtration facilities and the use of rainwater and recycled water, exploration of measures to prevent the inflow of the coliform group during rain into water areas at Odaiba Seaside park

- Efforts to create healthy water circulation in cities: improvement of water quality at the moats of Kokyo Gaien National Garden, construction of sewage water retention facilities, installation of advanced sewage treatment facilities, dredging and sand covering of rivers and canals and activities to regenerate Tokyo Bay in cooperation with various groups and organisations

-Target 2 - To develop the urban environment with the rich ecological network by conserving biodiversity, creating lush greeneries and the water environment, and forming an attractive landscape via the following actions:

- Greening at venues to conserve existing trees and native species

-Production of green areas and water spaces in the city and the development of pleasant landscapes: production of the network of water and green with parks and trees on streets, development of landscapes filled with flowers and greens and production of green areas by the private sector.

- Regeneration of the urban natural environment and conservation of biodiversity: conservation of biodiversity in prefectural parks (intensive environmental development at 18 parks by 2020), conservation of biodiversity in marine parks (actions to acquire the registration with the Ramsar Convention with the tidal flats at Kasai Kaihin park), promotion of greening that considers biodiversity (expansion of ecological network through greening using native species) and finally measures to combat alien species (prompt removal of alien species and awareness-raising campaigns)

- Production of ground for people to enjoy nature in the city such as relaxation spaces in parks (expansion of park routes facing the ocean and the expansion of areas where people can feel close to the ocean through the development of open spaces)and construction of oasis for citizens to enjoy nature around the Olympic/Paralympic Village and venues, construction of parks with disaster management functions

- Target 3 - To minimise the environmental load associated with the production, distribution, and other operations of the procurement phase of the Games by paying attention to prevent environmental contamination and protect biodiversity through:

- Prevention of contamination through the production and distribution of items procured for the Games and the management of chemical substances

- Materials and items produced with properly managed chemical substances must be selected to prevent air, water, and soil contamination

- Resources obtained from forests and oceans must be ones which are collected and cultivated using resource conservation measures

- Reduction of environmental load of constructions by using recycled items and raw materials containing recycled resources.

6.3. The governance of the plan

The Tokyo 2020 Games acted complex governance through a broad-based coalition that includes the Tokyo Organising Committee of the Olympic and Paralympic Games (Tokyo 2020), the Tokyo Metropolitan Government, the Government of Japan, as well as related local municipalities (regional/local governments of localities where competition venues are located), plus sponsors and other delivery partners. Tokyo 2020 is the heart of the coalition, while the Tokyo Metropolitan Government and the Government of Japan also play a key role.

Tokyo 2020 is a public interest incorporated foundation established to host the Tokyo 2020 Games. It is entirely responsible to the International Olympic Committee (IOC) and the International Paralympic Committee (IPC) for delivery of the Tokyo 2020 Games. Tokyo 2020 receives the funds necessary to host the Games from sources including IOC contributions, sponsorships, and sales of tickets and licensed merchandise. Following the selection of Tokyo as the Host City in September 2013, Tokyo 2020 was established as a general incorporated foundation on 24 January 2014, by the Japanese Olympic Committee (JOC) and the Tokyo Metropolitan Government. It subsequently became a public interest incorporated foundation on 1 January 2015.

In addition to offering across-the-board backup for the preparations carried out by Tokyo 2020, the Tokyo Metropolitan Government is fulfilling a range of responsibilities as the host city for the Games. These responsibilities involve funding the construction of the new permanent venues that are needed to host the Games, urban activities during the Games, as well as transport and security measures in areas near the Tokyo venues to minimise the impact of the Games on residents' daily lives. The medium and long-term urban strategy pursued by the Tokyo Metropolitan Government to facilitate the evolution of Tokyo into an advanced and mature 21st-century city while fostering harmony with the global environment underpins preparations and the delivery of the Tokyo 2020 Games.

Lastly, the Government of Japan is implementing a variety of related measures to ensure that preparations and the delivery of the Tokyo 2020 Games can proceed smoothly. Those measures include the construction of the Olympic Stadium by the Japan Sport Council (JSC) as well as security and anti-doping measures for which the Government is responsible. The Government of Japan established SDGs Promotion Headquarters chaired by the Prime

Minister whose members include all cabinet ministers. The Task Force adopted the SDGs Action Plan 2018 in December 2017, considering sustainability in the run-up to the Tokyo 2020 Games. Initiatives conceived to achieve a sustainable society by the Government and other Japanese stakeholders comprise the foundation on which the Tokyo 2020 Games, which strives to contribute to the achievement of the SDGs (Tokyo 2020, 2019).

From an early stage in the Games' preparation, Tokyo 2020 engaged in dialogue with a great number of people and entities (stakeholders), selected the main sustainability themes for the Games and also set detailed targets and issues in each theme through these dialogues. Furthermore, make continuous improvements by following the PDCA cycle - Plan, Do, Check, Act - important for ensuring that initiatives aligned with the main sustainability themes will be effective (Figure 33). For this purpose, the Organising Committee introduced a management system in conformity to ISO 20121, an international standard that supports sustainable events.

Figure 33. The Sustainability Management System embedded in the PDCA cycle (Source: Tokyo 2020, 2020).

In considering the sustainability of the Games, Tokyo 2020 promote efforts more appropriately and efficiently in response to global and domestic trends. The Tokyo Organising Committee has accordingly established the Urban Planning and Sustainability Commission, consisting of academics and experts from NGOs to have required discussions (Figure 34).

In the Commission, which is public and directly linked to the national level as underlined through a personal interview by the author with an Urban Engineering expert, the following two groups have been established to address specific issues depending on themes: the Sustainability Discussion Group (DG) to study specific issues and monitor the progress of sustainability efforts, and the Working Group (WG) to study issues from a more technical perspective. At these meeting boards, officials from the Tokyo Metropolitan Government and the Government of Japan participate in discussions as members or observers to examine the feasibility of direction and measures for each theme. These meetings boards have been carrying out specific studies in public during the development of the Plan and will continue reporting the status and monitoring the progress of the efforts based on the Plan.

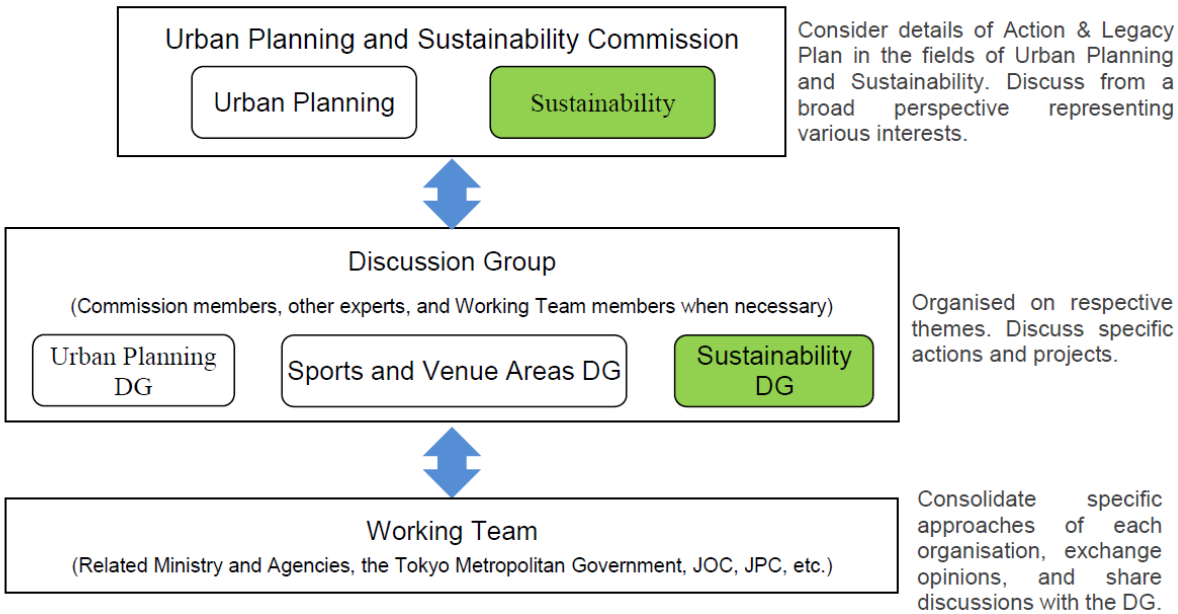

Figure 34. Study framework by the Commission members and other expertise (Source: Tokyo 2020, 2018).

Finally, the Bureau of Olympic and Paralympic Preparations of the Tokyo Metropolitan Government is responsible for preparing for the Games, developing the legacy for the event, and making sure that the Olympic and Paralympic Games are the best they can be. It oversees sports promotion measures. As of August 16, 2015, there were 245 staff members in the Bureau. The Organising Committee is proactively working on the preparation and operation of the Games. For instance, they prepare temporary facilities at the competition venues and athlete's villages and formulate a transportation operation plan and is responsible for general transportation operations, vehicle and driver arrangements.

6.4. Tools implemented

6.4.1. The National Strategic Special Zones Act

The National Strategic Special Zones (NSSZs) is an initiative set up by Abe's government to establish brand-new economic zones with business-friendly conditions by promoting bold deregulations. This initiative is one of the key policies of the "Japan Revitalisation Strategy" aiming at enhancing the international competitiveness of Japan by breaking traditional strict regulations. This initiative was first authorized at the 2013 Diet and followed by the appointment of six specific zones: "Tokyo area", "Kansai area", "Niigata city", "Yabu city", "Fukuoka city" and "Okinawa prefecture" in May 2014 (Cabinet Office, October 2013). Under Abe's government, six zones have been approved as the "NSSZ" aiming at promoting bold deregulations which are suitable for each special zone. On October 1, the council of the Tokyo area NSSZ was held, and a plan of essential deregulations for Tokyo to become a real global business hub through attracting foreign enterprises and relaxing existing floor-area-ratio regulations was presented (Figure 35). An Employment Guideline was agreed in advance between the Cabinet Office and the Ministry of Health, Labour and Welfare, clarifying the conditions under which an employment contract will enable dismissals. In formulating this Guideline, foreign law firms' views were considered. It was then decided that each Strategic Special Zones can set up an Employment Center, and a foreign corporation engaged in business in Japan can ask the lawyers of the centre to check free-of-charge whether their particular labour contract is under the Guideline. Second, concerning housing circumstances in big cities, in particular, Tokyo, that have been considered a major impediment for non-Japanese businessmen to come and work in Japan, it would be possible for them to live in a high-rise apartment close to their offices in the central part of Tokyo by the deregulation of floor-area ratio restrictions in residential buildings. With the existing rigorous floor-area ratio regulations, urban developers find it easy to earn money by building offices rather than residential apartments. But with the modification of this rule, they would start building high-rise apartments that businesspeople coming from abroad would find helpful. All major city developers in Tokyo have now announced plans to build residential buildings in the central areas of Tokyo. These plans have as deadline the year 2020 when the Olympics and Paralympics had to start in Tokyo.

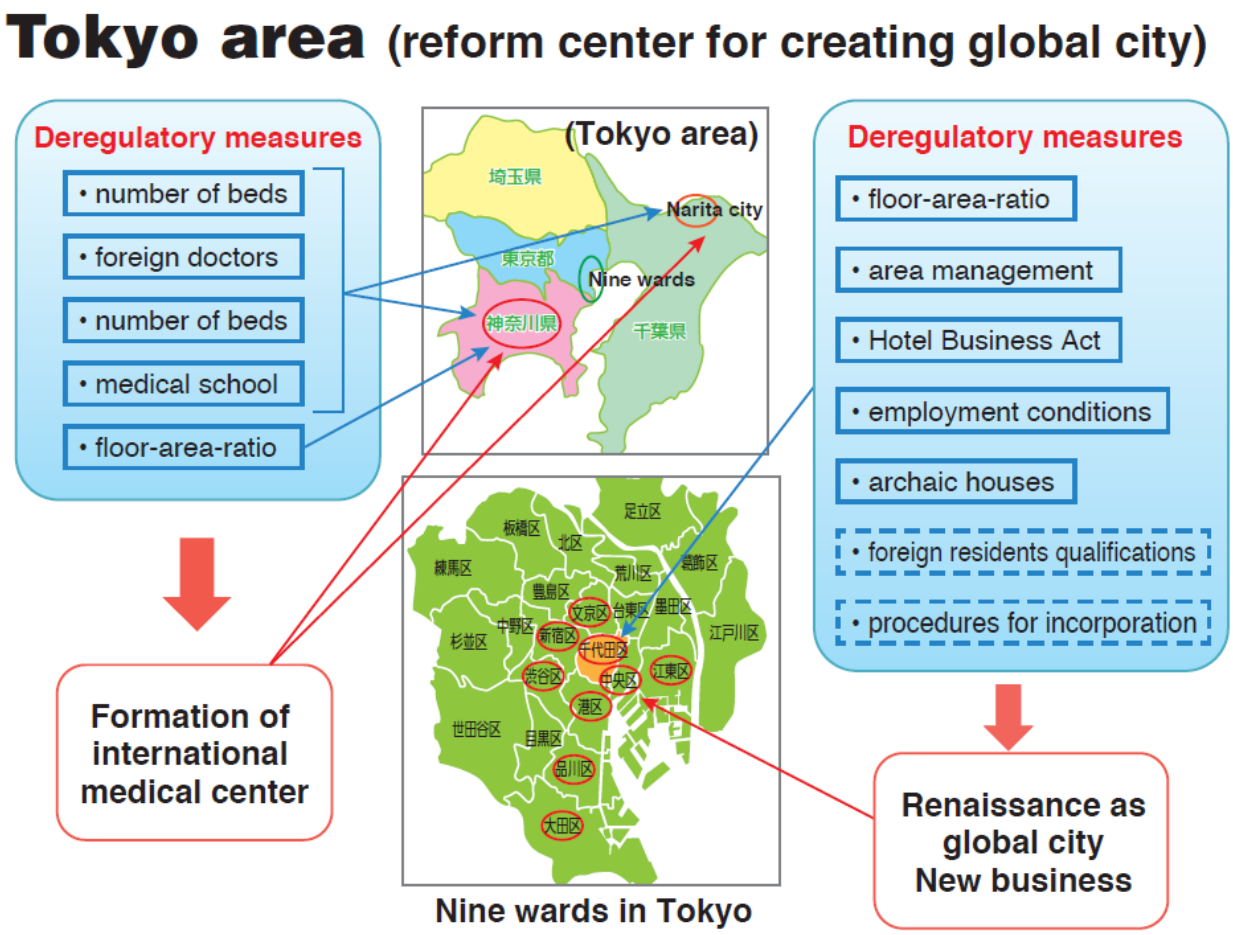

Figure 35. The Tokyo National Strategic Special Zone (Source: Prime Minister of Japan and His Cabinet, 2014).

To more powerfully proceed with reforms given in the revised Growth Strategy and produce effects as soon as possible, the government used an approach to narrow down priorities, time and agenda and concentrate policy resources on priorities in close cooperation with the Council for Regulatory Reform and the Council on National Strategic Special Economic Zones to achieve effects. Therefore, the government realized the revitalization of the Japanese economy based on two points: taking advantage of National Strategic Special Economic Zones to implement speedy, impactful reforms and accelerating reforms towards 2020 for the Tokyo Olympics and Paralympics.

Tokyo was chosen as the host of the 2020 Olympics and Paralympics after the creation of the Japan Revitalization Strategy last year, setting a new momentum for reforms. It was important to interpret this development as an opportunity to accelerate reforms and recover

a full-fledged growth path towards 2020 to vitalize not only Tokyo but also the whole of Japan. Towards the previous Tokyo Olympics in 1964, Japan accelerated public infrastructure development to restructure Tokyo and other locations, bringing about the so-called “Tokyo Olympic boom” and demonstrating vividly to the world that post-war Japan had returned to the international community.

As a main discourse, Japan, tackling those globally common issues causes by the declining birth-rate and ageing population, environmental problems, inequalities between rural and urban regions that are globally common, is expected to become a model for the rest of the world. Given that these problems are structural ones that cannot be solved in one day, Japan is required to assimilate various cultures for its integration into global society and tackle thorough economic and social restructuring, instead of pursuing a temporary boom (Prime Minister of Japan and His Cabinet, 2014).

6.4.2. TMG urban development vision

In 2015, six goals have been established and relative seven basic strategies to achieve the urban development vision of TMG through city Master Plan including pursuing sustainable development. The goals are listed below:

- Maintain and develop urban dynamism that is internationally competitive
- Coexist with the global environment, which is critical to sustainable development
- Restore urban spaces surrounded by rich greening and water
- Create, convey, and pass down the unique urban culture
- Create a city where residents can live comfortably and safely
- Obtain and coordinate the participation of a variety of entities, including residents, municipalities, corporations and non-profit organisations.

Consequently, seven strategies are presented by the Bureau of Urban Development:

- Improve the regional transportation infrastructure

- Establish centres that increase economic vitality
- Make the transition to a low-carbon city
- Create a network of water and greenery
- Define attractive urban spaces
- Achieve an improved living environment
- Create a highly safe, disaster-resistant city.

Generally, the urban vision pursues the construction of the “circular megapolis structure”, which allow the entire region to demonstrate its functionality. On the local level, TMG will move forward with plans to create more compact city hubs, through higher concentration of urban functions around train stations and other central locations (Bureau of Urban Development – Tokyo Metropolitan Government, 2016).

The vision divides Tokyo into five zones and sets out the role each zone will hold in the Greater Tokyo Area as well as the urban image that will be pursued, detailing an image for each area based on a wide perspective (Figure 36).

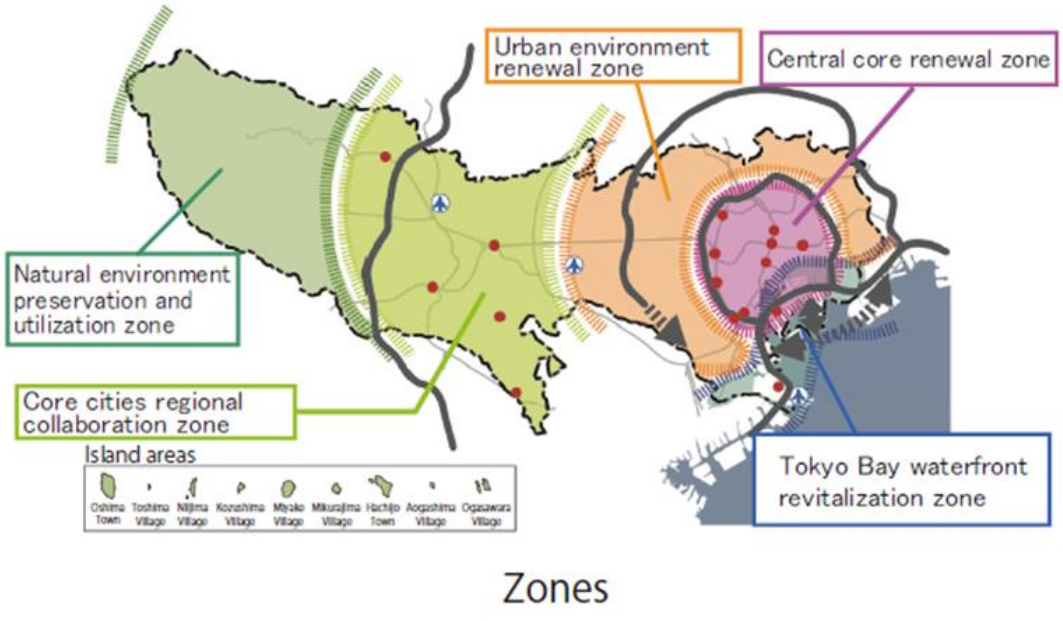

Figure 36. The five zones of the TMG urban vision (Source: Bureau of Urban Development – Tokyo Metropolitan Government, 2016).

6.4.3. The Environmental Master Plan - Creating a sustainable city

Looking forward to the Tokyo 2020 Olympic and Paralympic Games and beyond, TMG has set up a new Environmental Master Plan that showcases the environmental policies to be implemented by 2030. With arduous goals such as the GHG emissions reduction target and renewable energy target, TMG will commit to actions for a sustainable Tokyo at full scale and promote the engagement of citizens, businesses, and other stakeholders to achieve these goals (Figure 37). Additionally, TMG strongly encourages and promotes the sustainable policies described in the United Nations Sustainable Development Goals (SDGs), by piloting measures using the opportunity of the Tokyo 2020 Games.

In Tokyo, building energy efficiency has improved drastically, and decoupling of economic growth and energy consumption continues. On the other hand, GHG emissions have increased due to increasing thermal power generation after the Great East Japan Earthquake. TMG promotes energy efficiency and expand the introduction of renewable energy, considering the urban environment. Additionally, since hydrogen is one of the major low-carbon energy sources with other advantages such as energy diversification and low pollution, efforts are made to introduce hydrogen energy. The challenges are increasing in risks accompanying global resource consumption and increase in environmental impacts, such as increasing GHG emissions due to natural resource consumption and decreasing biodiversity and forests. As Tokyo is the largest resource consumption area in Japan, TMG promotes sustainable resource use aiming at becoming a resource-efficient city. Since the conservation of biodiversity in urban areas will become more important, TMG, in cooperation with various entities such as business operators, NPOs, and citizens, will plant trees considering the quality as well as the quantity. Owing to emission regulations for factories and diesel vehicles, the air quality in Tokyo has been significantly improved. TMG continuing to resolve remaining issues, reduction in the concentration of PM2.5 and ground-level ozone, while cooperating in the policy and technology of air quality management with other cities in Asia and the rest of the world. Higher temperature, together with the urban heat island effect, is still a significant issue in Tokyo (Bureau of Environment - Tokyo Metropolitan Government, 2016).

The Environmental Master Plan is divided into priority four themes: climate change and urban energy, sustainable materials and waste management, urban biodiversity and greening and clean and comfortable air, water and soil.

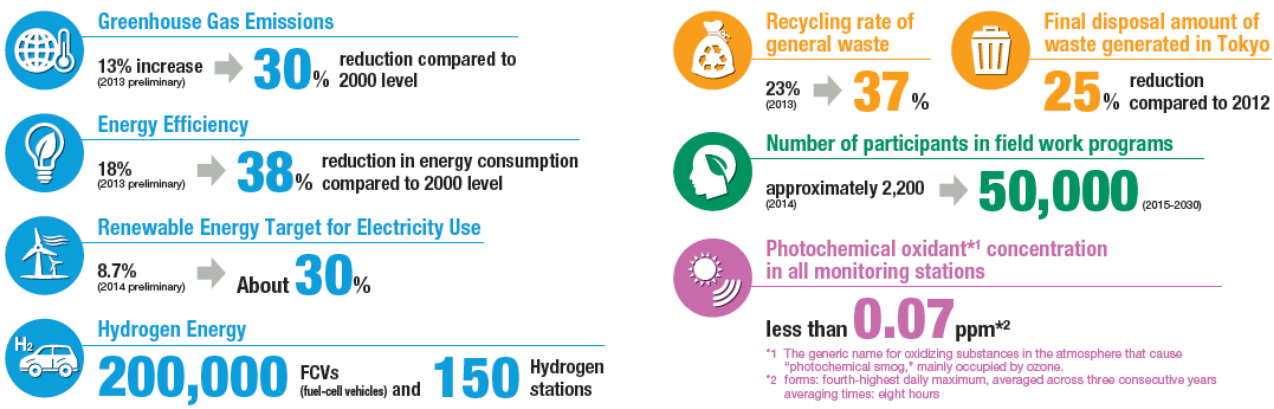

Figure 37. Tokyo's 2030 environmental goals (Source: Bureau of Environment - Tokyo Metropolitan Government, 2016).

Climate change and urban energy

Tokyo is aiming to become a "smart energy city," a city with a low-carbon, comfortable environment, and disaster resilience. TMG through three specific goals is introducing renewable energy and promoting hydrogen energy, in addition to further energy efficiency.

Firstly, promoting further energy efficiency and energy management is an essential contribution to overcoming climate challenges. Tokyo's Cap-and-Trade Program, targeting 1,300 large facilities, has achieved 25% CO2 emission reduction in the fifth year of the program compared to base-year emissions. TMG continues the program aiming for further reduction. To support energy savings of 630,000 small and medium-sized facilities, TMG promotes the value of low-carbon buildings in real-estate markets through its carbon reporting program. Newly introduced green leases promoting programs are expected to help to retrofit of tenant buildings. While supporting energy-saving activities and the introduction of energy creation devices in households, TMG fosters renovation of houses for improving energy efficiency and insulation performance, providing information about houses with high-level energy efficiency performance. Toward the Tokyo 2020 Games, TMG encourages the use of electric and hybrid vehicles including universally designed taxis that are friendly both to the environment and those with disabilities. Besides, reduces environmental loads in local mobility through measures such as promoting bike-sharing.

Secondly, renewable energy will be major energy that supports urban activities. Solar power generation introduced in Tokyo has significantly increased (based on the result of 2014, about an eight-fold increase compared to 2008). TMG also promotes other renewable energy, such as geothermal heat, considering the urban environment and supports an expansion of the introduction of renewable energy by multiphasic approaches, including providing citizens and business operators with proper renewable electric power information.

Finally, accelerating hydrogen energy use towards a low-carbon society. The Tokyo 2020 Games provides TMG with a great opportunity to clear the issues towards the wide use of hydrogen energy such as the creation of initial demand and installation of hydrogen stations. TMG is introducing fuel-cell vehicles including buses for the early stage and establishing a support system for stations. Efforts to raise public awareness and participation are also being conducted. To achieve a low-carbon society, TMG promotes and supports the production and utilization of hydrogen derived from renewable energy (Bureau of Environment - Tokyo Metropolitan Government, 2016).

Sustainable materials and waste management

Aiming at minimizing life-cycle environmental impacts from resource use and fulfilling its responsibility as a major city in developed countries, Tokyo takes the lead towards sustainable use of resources. TMG aims to encourage resource efficiency and a circular economy working with citizens, businesses, municipal governments, and NGOs. Also, aims to reduce losses in resource use, especially food loss from restaurants, households; encourages sustainable procurement among businesses including small and medium-sized enterprises. In this sense the choosing of sustainable wood products and recycled construction materials are top-priority issues. Furthermore, TMG promotes the 3Rs through standardizing the separate waste collection of commercial waste, utilizing incinerator ash as raw material for cement production. Besides, implements strict regulation for proper disposal of PCB - or mercury-containing devices (Bureau of Environment - Tokyo Metropolitan Government, 2016).

Urban biodiversity and greening

Conservation of the biodiversity of Tokyo in collaboration with various stakeholders is the main objective in this field: in Tokyo, individual regions such as forest, city, and island have diverse greenery and waterfronts. Tokyo's greenery including water areas has recently been decreasing more slightly, and it has started to increase in Tokyo's 23 wards. As objective will be preserved rich nature, create greenery, and establish an ecological network in consideration of ecosystems. Aimed at the Tokyo 2020 Games, TMG is promoting greening with flowers and plants in cooperation with various stakeholders and promotes actions of planting native species in consideration of biodiversity. TMG encourages citizens to participate in fieldwork programs to understand more about the natural environment and biodiversity, thereby nurturing people who will help conservation in the future. There are various needs in becoming familiar with nature, such as diversified sightseeing tourists and use for sports. TMG enhances the convenience including Wi-Fi and multilingual support, lets people know about the manner of using nature parks, and ensures both nature conservation and use. Besides, preserves the ecosystems of the Ogasawara Islands, which is a world natural heritage, to safeguard rare species (Bureau of Environment - Tokyo Metropolitan Government, 2016).

Clean and comfortable air, water and soil

To create a clean and comfortable urban environment, TMG will reduce the concentration of PM2.5 and ground-level ozone, as well as the emission of chemical substances. Also, TMG will improve attractive waterfront environments such as springs and Tokyo Bay, while working on measures for climate change adaptation.

Firstly, aiming at the highest level of clean and comfortable air environment: through Tokyo's unique low-NOx and low-CO2 smaller combustion device certification program, TMG is promoting combustion devices that impose a lower environmental burden, promotes the use of electric and hybrid vehicles and provides careful technical support to small and medium-sized businesses through VOC guidebooks classified by sector and dispatching advisors to their facilities.

Secondly, preserving and creating attractive waterfronts creating attractive waterfronts in coastal and other areas, as well as preserving springs and enhances the safety of rivers to mitigate natural disaster damage.

Thirdly, promoting measures for extreme summer heatwaves in urban areas: TMG creates cool spots by using, for example, dry-type mist generation equipment in collaboration with business operators and municipalities, as well as employing heat blocking pavements and roof greening (Bureau of Environment - Tokyo Metropolitan Government, 2016).

6.4.4. The TMG Tokyo Action Plan for 2020

In December 2016, the Tokyo Metropolitan Government formulated a new comprehensive 4-year plan called “New Tokyo. New Tomorrow. The Action Plan for 2020,” which covers the period from FY2017 through FY2020 with a project cost of JPY 1.42 trillion for FY2017 and JPY 5.61 trillion over the four years. From the perspective of putting the Tokyo citizens first, TMG will pursue the realization of the three faces or “cities” of Tokyo - “Safe City,” “Diverse City,” and “Smart City” - and create the “New Tokyo”. Safe City where are protected the lives and assets of the Tokyo residents from all kinds of disasters and build a dynamic and bustling Tokyo. Diverse City which will be Tokyo, full of kindness and warmth where everyone can lead vibrant lives and be active in society. Finally, Smart City as a global megacity and Japan’s capital and engine driving the economy, and a sustainable Tokyo that can solve the challenges facing the megalopolis and continue growing to emerge victorious in the international competition between cities (Tokyo Metropolitan Government, 2017). Creating the “New Tokyo” by realizing the three cities from the perspective of placing the Tokyo citizens first through the following initiatives for the success of the Tokyo 2020 Games:

- A Tokyo where all can live with peace of mind, hold hopes and lead active lives.

- Sustainable Tokyo continues to generate growth.

- A Tokyo that shines throughout the world as the engine driving Japan’s growth.

This section will deal with the smart city concept even because in itself are embedded the objectives of safe and diverse city. To become a world-leading smart energy city, TMG spread the use of LED lights, promote energy-saving measures and advance the use of hydrogen that does not emit CO2 in its production. Specifically:

- Encourage households, buildings, and factories to introduce LED lighting, and set an example by using LED lights at metropolitan facilities.

- Promote eco-houses, energy-saving measures at buildings and factories, and the conversion of metropolitan facilities to zero-energy buildings.

- Conduct research on hydrogen that does not emit CO2 in its production.

In this sense, TMG starts an initiative where people can receive one LED bulb in exchange for two incandescent bulbs at electrical appliance stores (up to 1 million LED bulbs).

TMG will make the citizens' lifestyles sustainable through such measures as reducing food loss as being *mottainai* (too precious to waste).

- Draw up the "Tokyo-Style Food Loss Reduction," a set of rules to reduce food loss and waste.

- Encourage stores to stop the free distribution of plastic shopping bags, and rethink our disposable lifestyle.

- Make effective use of emergency food stock nearing the end of their recommended consumption period.

The Tokyo 2020 Games will be held in the summer season and for the climate, TMG aims to improve the urban environment and also create a city surrounded by water and greenery where people feel close to nature.

Take intensive measures to address the heat, including creating "cool areas". Decorate the city with flowers and greenery, by enhancing parks and planting roadside trees. Preserve and protect greenery on private land, the precious greenery remaining in Tokyo while creating an environment where people can coexist with a variety of species.

To restore Tokyo to its position as Asia's No. 1 global financial city, promotion of bold measures to revitalize the financial industry must be necessary. Foreign financial firms attracted to Tokyo by the TMG through issue green bonds and advance environmental

policies. Accelerate efforts to attract foreign businesses in the fintech, Internet of Things (IoT), and similar fields, by helping them draw up business plans and get connected to Japanese firms. Promote efforts to create a more comfortable environment for foreign businesses and their employees. Creating innovations and supporting SMEs which expanding into growth industries with TMG support. Besides, SMEs expanding into overseas markets with TMG support

Moreover, TMG will implement measures for the sustainable growth of Tokyo, including technological innovations of SMEs, which are the foundation of the Japanese economy and encouraging business start-ups. As following different measures undertook:

-Publicize, at home and abroad, traditional crafts and agricultural produce harvested in Tokyo, to promote the Tokyo brand.

-Support start-up firms in evolving into global businesses.

-Support development projects that connect the excellent ideas of SMEs with technologies (including patented ones) of industry leaders.

-Revitalize businesses by utilizing IoT and other innovative technologies.

Another relevant field is tourism: through developing and publicizing tourism resources, convey Tokyo's attractions throughout the world and create an environment where travellers can enjoy sightseeing in comfort. Publicize tourism resources that attract interest from foreign people, such as anime and manga, as a part of Japanese culture, prepare a comfortable environment for international visitors, such as making signs multilingual and introducing more western-style toilets and finally collaborate with another international tourist destinations to publicize each other's attractions.

Linked to the last initiatives is the matter of implementing a cultural program in all municipalities for the Tokyo 2020 Games such as hold the TOKYO Caravan, which brings together artists from various genres, in areas throughout Japan, including those affected by major natural disasters. Moreover, cooperate with local municipalities and private-sector groups for community development efforts in Tokyo that draw on the attractions and strengths of each area. Also, promoting the arts and culture-making at least five districts, including Ueno, Ikebukuro, and Roppongi, more attractive as centres for the arts and culture. Tokyo utilizes its diverse mix of arts and culture to make our culture-rich districts even more attractive, and, as part of the cultural program for the Tokyo 2020 Games, hold events that

allow a broad range of people to take part; undoubtedly, the Olympic and Paralympic Games are not only a festival of sport but also a festival of culture (Tokyo Metropolitan Government, 2017).

Lastly, the importance of building up the land, sea, and air transport network is highlighted, creating a city where people and goods move smoothly. There is a need to ease road congestion and crowding on trains, and to accommodate the large number of international airport users coming for the Tokyo 2020 Games. Therefore, the promotion of the construction of the three-ring expressways (e.g. the Tokyo Outer Ring Road) to open about 90% to traffic is required (Figure 38).

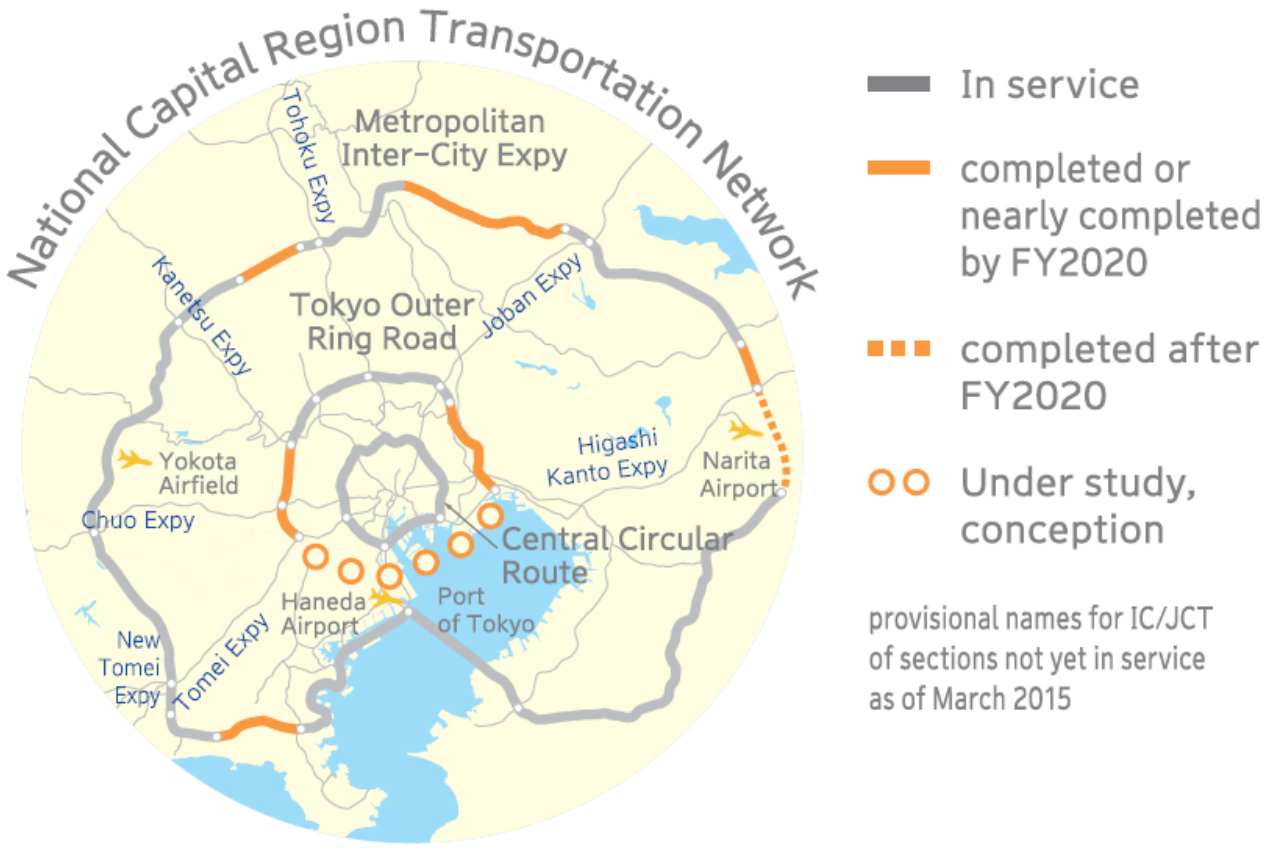

Figure 38. Tokyo's three-rings infrastructure (Source: Tokyo Metropolitan Government, 2017).

Then, bolster the road network, including backbone trunk roads, to fully realize the potential of Japan's capital. Also, build a terminal capable of accommodating the world's largest cruise ships, conduct studies on the possible construction of the proposed railway lines. Besides, will be essential several feasibility tests of an autonomous driving system will take

place in the vicinity of Haneda Airport and elsewhere. Another issue is related to the capacity of Haneda Airport: to expand it, request the national government to give a detailed explanation to residents regarding flight routes changes and to take safety and noise prevention measures. Moreover, bolster the functions of Haneda Airport that is directly linked to the realization of Shinagawa Smart City Project: started in 2012 when the area around Shinagawa and Tamachi Station has been defined as a “Special Priority Area for Urban Renaissance” and, in 2014, a “National Strategic Special Zone”. The rationale why the area was designated under these terms was that there is an overall potential of the area based on the fact that there is an increase of international flights from and to Haneda Airport and also because in 2027 the Linear Chuo Shinkansen high-speed train service will be launched. For this purpose, the TMG published the “Area around Shinagawa Station and Tamachi Station Community Development Guidelines” in 2014 intending to transform the Shinagawa area as the new gateway of Tokyo. Finally, in 2016, plans were approved by the city council for the Shinagawa Station Block District and the District Around Shinagawa Station North (Bureau of Urban Development - Tokyo Metropolitan Government, 2018).

As it is conceivable to observe in the plan about the guidelines for the area from the Tokyo Metropolitan Government (Figure 39), these two priority districts are located respectively in proximity to the Shinagawa Station and a scheduled new station.

In particular, the latest scheduled station is called Takanawa Gateway Station and it has a strategic position, since it is located between the central Tokyo - only 11 minutes by train - and the Tokyo International Airport Haneda - almost 13 minutes by train - and therefore, here is where the Tokyo Metropolitan Government aims to transform the Shinagawa area as the new gateway of Tokyo. Besides, Takanawa Gateway Station is very close to Shinagawa Station - only 2 minutes by train - and approximately close to vibrant places in Tokyo such as Shibuya and Shinjuku stations - respectively 15 and 21 minutes by train (East Japan Railway Company, 2019).

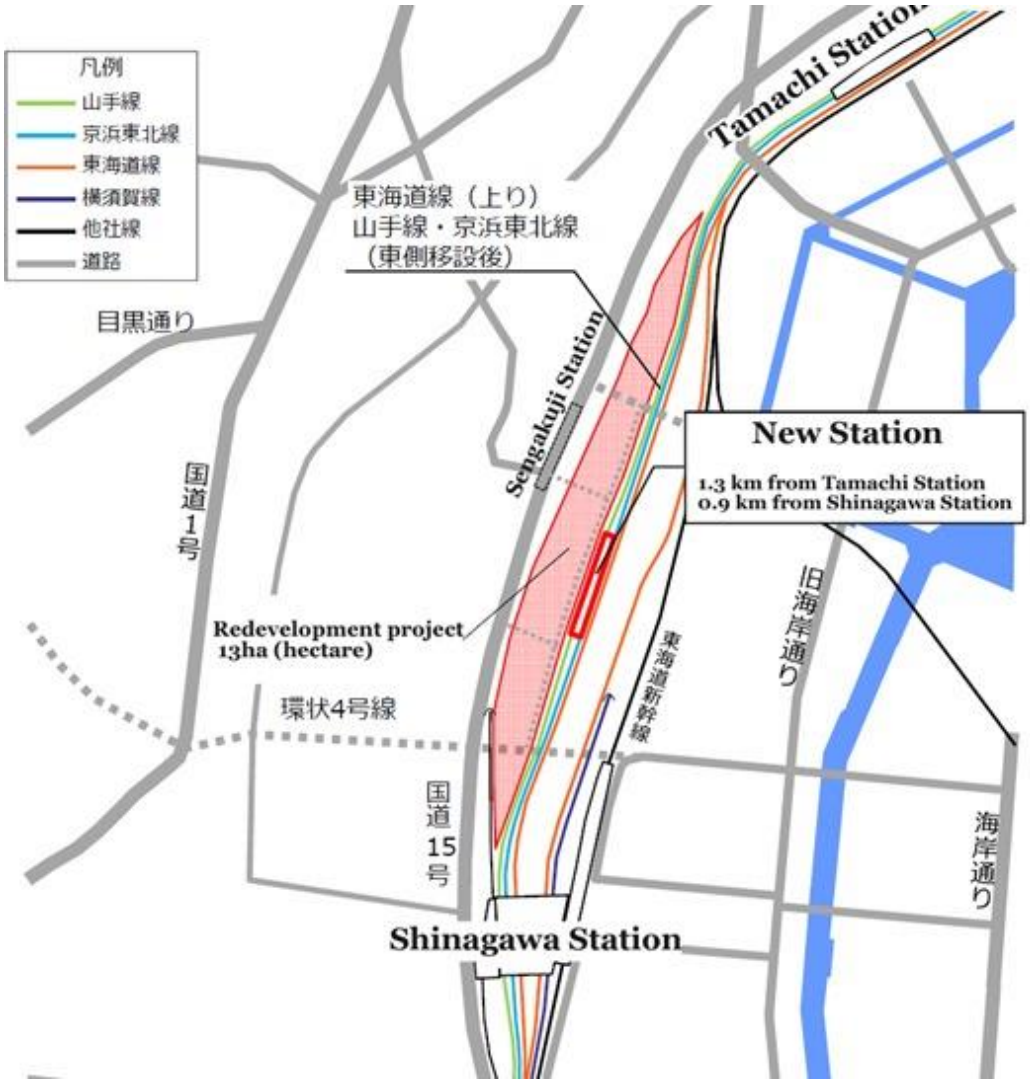

Figure 39. Redevelopment project of new station in Shinagawa Area (Source: Bureau of Urban Development – Tokyo Metropolitan Government, 2018).

6.4.5. Towards 2020 – Building the legacy

The revised edition of “Towards 2020: Building the Legacy” published in 2018, first formulated in FY2015, reflects subsequent changes and trends, including the TMG comprehensive four-year plan, which covers the period of the plan “New Tokyo. New Tomorrow.The Action Plan for 2020.”

By clarifying how TMG initiatives relate to eight themes that focus on the Tokyo 2020 Games legacy, in areas including development of competition venues and the Athletes’ Village,

culture, education, the environment, economy, and recovery of the areas affected by major disasters in recent years, mainly the areas affected by the 2011 Great East Japan Earthquake (Bureau of Olympic and Paralympic Games Tokyo 2020, 2018). In particular, this section outlines the first theme which covers and is linked to other themes (Figure 40).

Figure 40. Concept of legacy by TMG (Source: Bureau of Olympic and Paralympic Games Tokyo 2020, 2018).

Using the Games as an opportunity to expand Tokyo's centres for sports

The competition venues to be newly developed by the TMG (new permanent venues and others) will be steadily advanced through strict progress management and proper disclosure of information. For new permanent venues, will be ensured effective post-Games use, based on the facility management plan formulated in April 2017. Therefore, a hub for sports in the Tama area which combines the Musashino Forest Sport Plaza, which opened in November 2017, and Tokyo Stadium, one of the Rugby World Cup 2019 venues, will be formed. TMG advance upgrades to the infrastructure aimed at realizing the "Sports City Tokyo" concept, which will be formed by a combination of new competition venues and other sports facilities, including renovations to make existing sports facilities barrier-free and support for municipal sports facilities.

Making the site of the Athletes' Village an attractive place for anyone to live

Near the centre of Tokyo, surrounded by greenery and facing on to the sea, a new community will be born at the site of the Athletes' Village. The features needed to draw a diverse range of people and create a dynamic city that offers comfortable living will be introduced. Besides, an environment that enables anyone to easily move about will be created using uniform signage on roads and in the commercial block and barrier-free design. The intent is to create a city open on to the sea with continuous greenery, blending elements such as roads, housing, and waterfront space into the landscape. Also, more accessible, and eco-friendly transportation methods will be introduced.

TMG will establish a hydrogen station, advance studies on the introduction of pure hydrogen type fuel cells, create Japan's first full-fledged hydrogen supply system, and make the city a model for the realization of a "hydrogen society." Through the installation of fuel cells, storage batteries, and other systems, privately-owned condominiums will achieve a higher rate of energy self-sufficiency, creating a community that can function independently in times of disaster. Finally, will make the city eco-friendly through efforts such as the introduction of energy management and the installation of solar power systems.

Improve transportation and access to the bay area

Introduce a Bus Rapid Transit (BRT) system connecting the centre of Tokyo and the waterfront city to meet transportation demand. Promote bike-sharing by improving the environment for cycling, advance the development of recommended cycling routes that will enhance the convenience and comfort of users and promote utilization of water transportation by testing routes linking the city centre, waterfront area, and Haneda. Vitality will also be created along the water by creating areas of greenery and attracting businesses such as restaurants.

Promote upgrades to make facilities barrier-free ahead of the Games

Promote upgrades to make metropolitan roads, metropolitan parks, and railway stations around competition venues barrier-free (Figure 41). In this sense, the Tokyo 2020 Accessibility Guidelines will be reflected in the TMG's development of competition venues, and upgrades to venue access paths will be accelerated. TMG will also apply these accessibility guidelines to further promoting city planning based on the universal design concept.

Figure 41. Barrier-free facilities promoted by TMG (Source: Bureau of Olympic and Paralympic Games Tokyo 2020, 2018).

Promote initiatives to enhance the safety and security

Advance the removal of utility poles along metropolitan roads near competition venues and in other locations and support the initiatives of Tokyo municipalities aimed at removing utility poles in areas such as around competition venues and other facilities.

To build crisis management systems that unite the public and private sectors, TMG will ensure the safety and security of everyone who comes to the Tokyo 2020 Games, investigating risks from the standpoints of public safety, cybersecurity, disaster response, and infectious diseases, compile procedures on handling each situation, and conduct

practice drills. The crisis management systems that unite the public and private sectors by strengthening cooperation between related organizations such as the central government and the Tokyo 2020 Organising Committee and clarifying the division of responsibilities. Through the establishment of an urban operations centre during the Games, urban functions as the host city will be maintained, and smooth Games operations will be supported. By holding tours of infrastructure facilities and other efforts promoting the effective disaster's preparedness and response capabilities to the world (Bureau of Olympic and Paralympic Games Tokyo 2020, 2018).

6.5. Monitoring mechanisms

To put in place specific efforts and to achieve the goals set out in the Plan, establishment of a management system working for implementation of the Plan is vital.

The Tokyo Organising Committee implemented a management system in line with ISO 20121:2012, an international standard for the Event Sustainability Management System (ESMS) developed to help events be sustainable, and monitor progress, continuing with trades of opinions with a wide range of people including experts in various fields. In accordance with progress and changing situations about promotion of each programme, review is conducted and continual improvement of the efforts of the Plan.

The ISO 20121 was issued in 2012 coinciding with the establishment of a management system for the sustainability of the London 2012 Olympic and Paralympic Games. It provides a framework that contributes to considering sustainability of an event by managing not only environmental but also economic and social impact related to event operations.

Prior to developing the Plan, the Tokyo Organising Committee has set the "Sustainability Policy," required by the ISO 20121, in which is underlined the concept to realise sustainable Games operations and declare the establishment of a management system in line with the ISO 20121.

A system to formulate plans (Plan), implement policies and programs (Do), manage progress and evaluate programs (Check), and improve and review programs (Act) which is denominate the PDCA cycle, was incorporated into the plan from the formulation stage.

The Plan and the goals thereof fall on “Set targets and plans to achieve them,” one of the requirements of the ISO 20121. Tokyo 2020 ensure the delivery of the Plan by continual improvement by following the PDCA cycle (Figure 42) composed of operational management, monitoring and evaluation of results, and correction of any non-conformity.

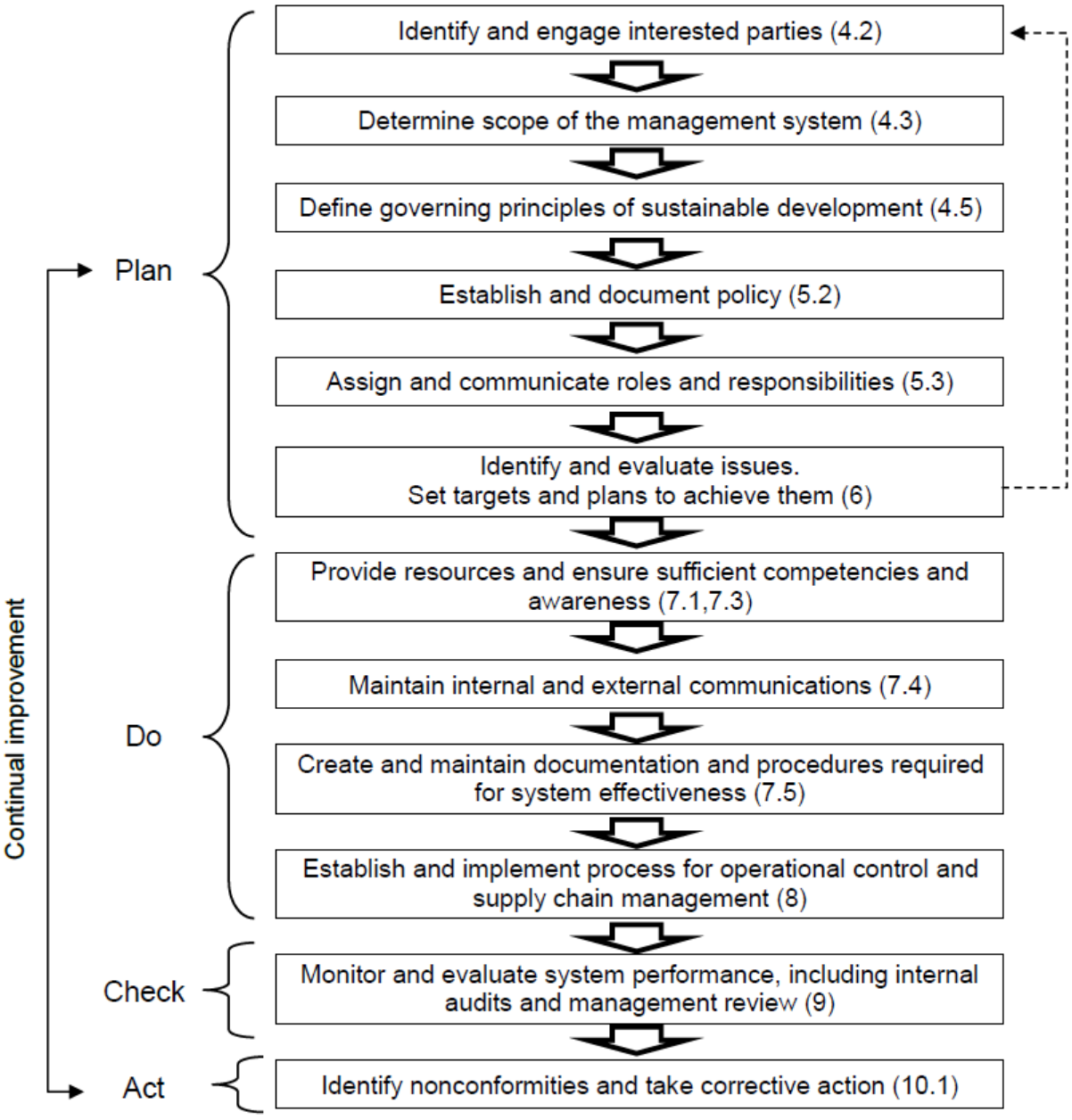

Figure 42. PDCA cycle as management and monitoring system (Source: Tokyo 2020, 2018).

The ISO 20121 requires the practice of “monitoring, measurement, analysis and evaluation” to manage targets and plans to achieve them. To enable proper self-administration of the efforts of the Plan based on the requirement, the establishment of a monitoring system is

required in which targets to be measured and monitored are set and methods and schedules are determined. The Organising Committee thereby will implement proper evaluation of achievements of the efforts and the availability of the management system.

The progress report will be reviewed by the top management of the Tokyo Organising Committee, and the entire process of the Tokyo Organising Committee and good practices of Functional Areas[7] are shared in the "Sustainability Strategic Meeting," attended by Executive Directors to have discussions on sustainability. Reports will be compiled in spring of 2019, spring of 2020 and winter of 2020/2021.

Regarding reuse and recycling of products procured by delivery partners as well as the Tokyo Organising Committee, will keep track of each process by establishing a management system that collects comprehensive information from procurement to disposal phases.

Tokyo 2020 has defined the eight aspects of sustainability and will work as reference when are defined specific aims and monitoring methods for a temporary venue and overlay development (Tokyo 2020, 2018). Consequently, these eight aspects of sustainability detected will be used for evaluating the final impact of the Olympic Games:

- Low energy, low CO2 buildings
- 3Rs, waste reduction
- Sourcing of eco-friendly goods
- Natural environmental/biodiversity
- Air, soil, water, noise and vibration measures
- Heat management
- Ensuring the accessibility of buildings
- Health and safety at a construction site.

[7] Tokyo 2020 has established 52 Functional Areas (FAs) to oversee a variety of functions and operations required in the delivery of the Games. Sustainability (SUS) is one of the 52 Functional Areas that make up Tokyo 2020.

6.6. Impact estimate and progress reached

All the impact and progress are listed in the Tokyo 2020 sustainability pre-Games report that was initially scheduled to be released on 30 March 2020. This date was postponed in line with the decision to postpone the Tokyo 2020 Games.

However, considering the importance of the sustainability pre-Games report as a reference document for our stakeholders and all interested parties, the report was published on 30 April 2020. Most of the information contained in the sustainability pre-Games report is unaffected by the postponement of the Tokyo 2020 Games. Below is placed the comparison between goals and progress reached (Figure 43).

Figure 43. Tokyo 2020 goals and progress (Source: Tokyo 2020, 2020).

6.6.1. Climate change: Towards Zero Carbon

In terms of progress and issues, for carbon management of the Tokyo 2020 Games, the amount of greenhouse gas emissions related to the Games is determined in terms of carbon footprint. Tokyo 2020 calculated the carbon footprint for the case with no measures taken and the case with the actual avoidance and reduction measures taken (Figure 44). For venue development, it was maximised the use of existing venues as an emissions avoidance measure. When constructing new permanent venues, energy-saving technologies as a reduction measure were selected. For overlay construction such as temporary spectator seats and tents, rentals or leases were practised. For passenger cars for transporting Games stakeholders, Tokyo 2020 use clean, fuel-efficient vehicles such as fuel cell electric vehicles (FCEVs) and plug-in hybrid electric vehicles (PHEVs). Also, was preferred the use of many types of battery electric vehicles (BEVs). With all these measures in place, the reduction of carbon footprint is about 280,000 t-CO2. The Games carbon footprint (the amount of CO2 and other emissions) was expected to be about 3,010,000 t-CO2 without any measures. Nevertheless, this was reduced by about 280,000 t-CO2 because of implementing avoidance and mitigation measures such as the use of rentals or leases, use of existing venues, renewable energy use, and enactment of energy-saving facilities.

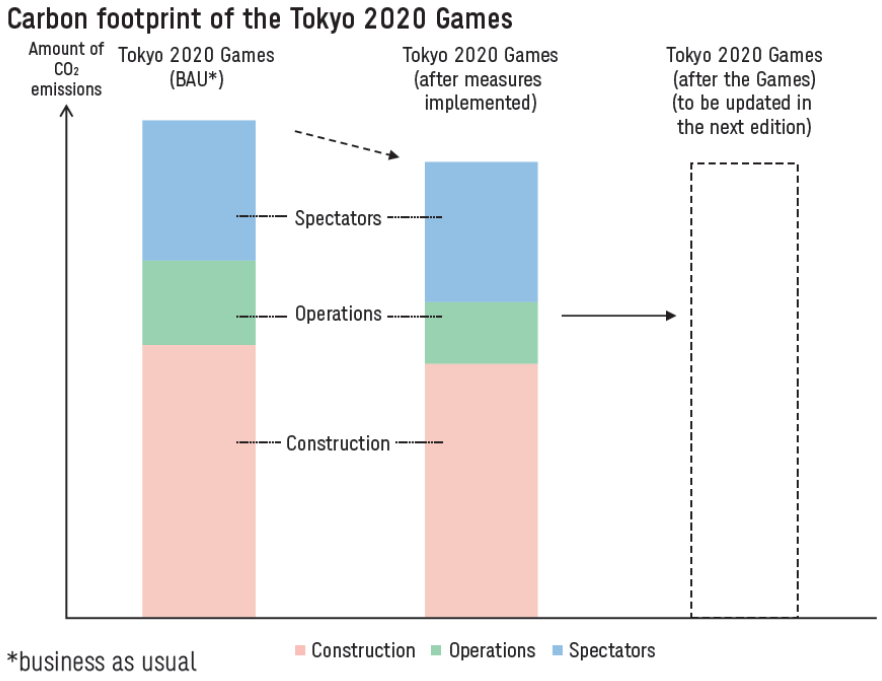

Figure 44. Tokyo 2020 carbon footprint (Source: Tokyo 2020, 2020).

Furthermore, another target is about to achieve 100% renewable energy use for electricity used to run the Games, via procurement from renewable energy sources and use of tradable green certification system. For renewable energy sources, the aim is to use power generated in Tohoku and other regions.

Aside from adopting FCEVs for the Games, hydrogen will be used as a fuel for both the Olympic and Paralympic Cauldrons and the Torches during part of its journey through Japan. TMG is using hydrogen energy as an energy source in some facilities in the Olympic/Paralympic Village, helping to create a hydrogen-based economy. Apart from minimising the number of passenger cars employed in the Games, Tokyo 2020 actively introducing FCEVs and PHEVs. This is projected to result in average CO2 emission intensity of fewer than 80 g-CO2/km for 2,700 passenger cars used for the Games. For route buses in the Olympic/Paralympic Village as well as aid and rescue vehicles around the venues, will be adopting BEVs that do not emit CO2 and other gases when running.

Besides, Tokyo 2020 will offset CO2 generated even after taking avoidance and reduction measures and in this sense, TMG and Saitama Prefecture are accepting applications for credits; so far, many businesses and organisations have been donating credits. A portion of the credits collected will be allocated to the Tokyo 2020 Games. Also, the Organisation Committee promotes activities of CO2 reduction by citizens at the Tokyo 2020 Games, spreading the word on initiatives by local governments and citizen groups, along with data on their carbon reduction. Through this work, will be possible to advocate carbon reduction to the wider public and encourage their active and long-term participation in such initiatives.

6.6.2. Resource management: Zero Wasting

Through collective efforts throughout the entire supply chain, is committed to managing resources effectively to eliminate environmental impact by fully utilising resources and avoiding land devastation and deforestation generated by resource exploitation. At the Tokyo 2020 Games, the engagement of spectators, Games staff and other related personnel at the venues in recycling activities, as well as in initiatives that allow residents to participate during their daily lives. Through these activities, will be agreeable to cover the way toward the creation of a society where resources are fully utilised. Goal 12 of the SDGs was set to ensure sustainable consumption and production patterns; the various efforts undertook to

maximise resources for the large amounts of materials and goods procurement at the Tokyo 2020 Games provide a great chance to achieve the Goal 12.

Regarding progress reached, for items to be used at the Games, Tokyo 2020 pursuing sustainable procurement practices by establishing rules for their management and disposal, and carrying out a procurement and disposal procedure that will enable their reuse and recycling after the Games. The impact on marine ecosystems of single-use plastic containers, packaging and products that turn into ocean waste is a serious concern. For wastes generated during operations and delivery of the Games, Tokyo 2020 encourage spectators and personnel to cut down on the use of single-use plastic products and recycle waste items.

Tokyo 2020 also working on projects that encourage reuse and recycling. To produce items to be used at the Games such as torches and uniforms for the Torch Relay, and Olympic/Paralympic medals and podiums, will be used recycled materials collected through the cooperation of numerous people nationwide. Through these initiatives, the aim is to foster recycling and other practices among the people and help create a sustainable society.

Moving forward, the actions go to further expand the reuse and recycling efforts until the Games, also advance actions such as reducing food waste, containers and packaging. Also, it is committed to curbing waste generation and to properly sorting waste before transporting to recycling facilities, to achieve 65% of recycling target.

6.6.3. Natural environment and biodiversity: City within Nature/Nature within the City

Looking ahead to the legacy, Tokyo 2020 working in collaboration with TMG and other stakeholders to restore and conserve biodiversity through the Games and contribute to the creation of a new urban system that will improve comfort and resilience and restore and foster rich ecological networks. These initiatives include a range of elements described in the SDGs as crucial to sustainable cities: access to water and sanitation, safe and resilient infrastructure and housing, and ecosystem conservation and restoration.

To make the environment in the city more pleasant, carrying out trials aimed at limiting declines in water quality at Odaiba Marine Park, a competition venue, after rainfall and are considering measures for the Games based on the results. Also working to enhance the city's water circulation functions. TMG, the Japan Sport Council (JSC) and Tokyo 2020 are working to make Games venues greener through tree planting and other landscaping, green walls, sustainable drainage systems. Also, considering conservation of habitats such as wild birds and aquatic life in the venues located on the waterfront, TMG is working with diverse stakeholders to boost the environmental capacity of the marine parks that surround many competition venues as a basis for protecting biodiversity in coastal areas.

Tokyo 2020 requires suppliers and licensees to make efforts to prevent environmental pollution, protect biodiversity, and in other ways promote sustainability by implementing the Tokyo 2020 Olympic and Paralympic Games Sustainable Sourcing Code. The national government and TMG have been promoting related initiatives, such as implementation and certification to Good Agricultural Practices (GAP).

6.6.4. Achieving sustainability in venue development

At every stage of venue construction, was given by all the stakeholders the highest priority to sustainability. At the same time, urban models that utilise the latest technologies were preferred and Tokyo 2020 continued to globally publicise forward-looking initiatives, including resource recycling with advanced technology and the creation of rich green spaces that consider biodiversity. Among all the activities associated with delivering the Games, the preparation of competition venues has been anticipated to have a particularly large impact on sustainability.

Tokyo 2020 will also continue to globally publicise forward-looking model cases which have been undertaken as part of the legacy after the Games, including presenting urban models for an energy-saving and hydrogen-based society that utilise the latest technologies, resource recycling with advanced technology—from procurement of materials to post-Games reuse and recycling—and the creation of rich green spaces that consider biodiversity.

Related to progress completed and issues concerned, construction of the Olympic Stadium was completed in November 2019 with many sustainability initiatives, including using energy-saving technologies and high standards of accessibility. Sustainability was also a key feature of the eight permanent venues, including the Tokyo Aquatics Centre. These venues will not only function as competition venues for the Games but will also continue to be used as valuable public properties long after the Games (Figure 45).

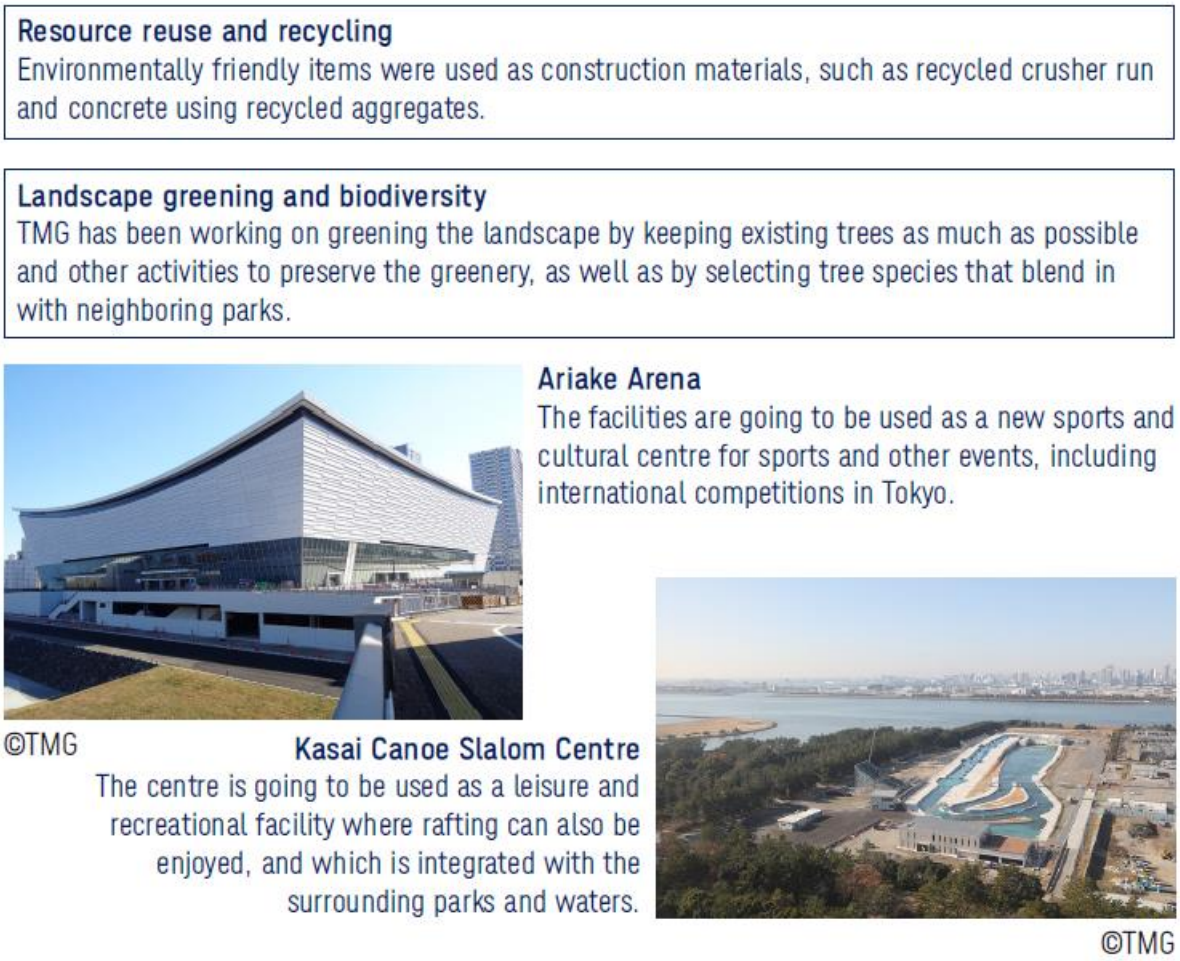

Figure 45. Tokyo 2020 actions on development and legacy venues (Source: Tokyo 2020, 2020).

Temporary venues construction has been partially completed, while overlay installation is ongoing at many venues. Since these facilities will be dismantled and removed after the Games, the required materials are leased or rented whenever possible. The accommodation buildings for the Olympic/Paralympic Village were completed in December 2019, while the Village Plaza is scheduled to be completed in April 2020.

Since development and construction of these venues involve prime contractors and subcontractors, the Organising Committee provided consistent health and safety training to everyone concerned and encouraged the creation of a workplace where people are motivated to work, with policies such as the shortening of working hours (Tokyo 2020, 2020).

The construction of permanent and temporary facilities in Tokyo Bay for the 2020 Summer Olympics allows developing a succession-based design strategy-not only for the 2020 peak condition, but also in anticipation of future transformations according to the intention of guarantee a positive legacy. This will take the form of a resiliency districting study for Tokyo Bay, with a particular focus on the islands and coasts situated along a transect cutting through the historic centre of the city, coastal reclamation areas, near-shore and off-shore islands, one of which is under construction. The Olympic facilities proposed for the 2020 games are also sitting on these areas. While the permanent facilities on inland sites are less vulnerable to risk, the coastal ones which are mostly temporary are open to liquefaction and inundation hazards (Figure 46) (Oktem, 2016).

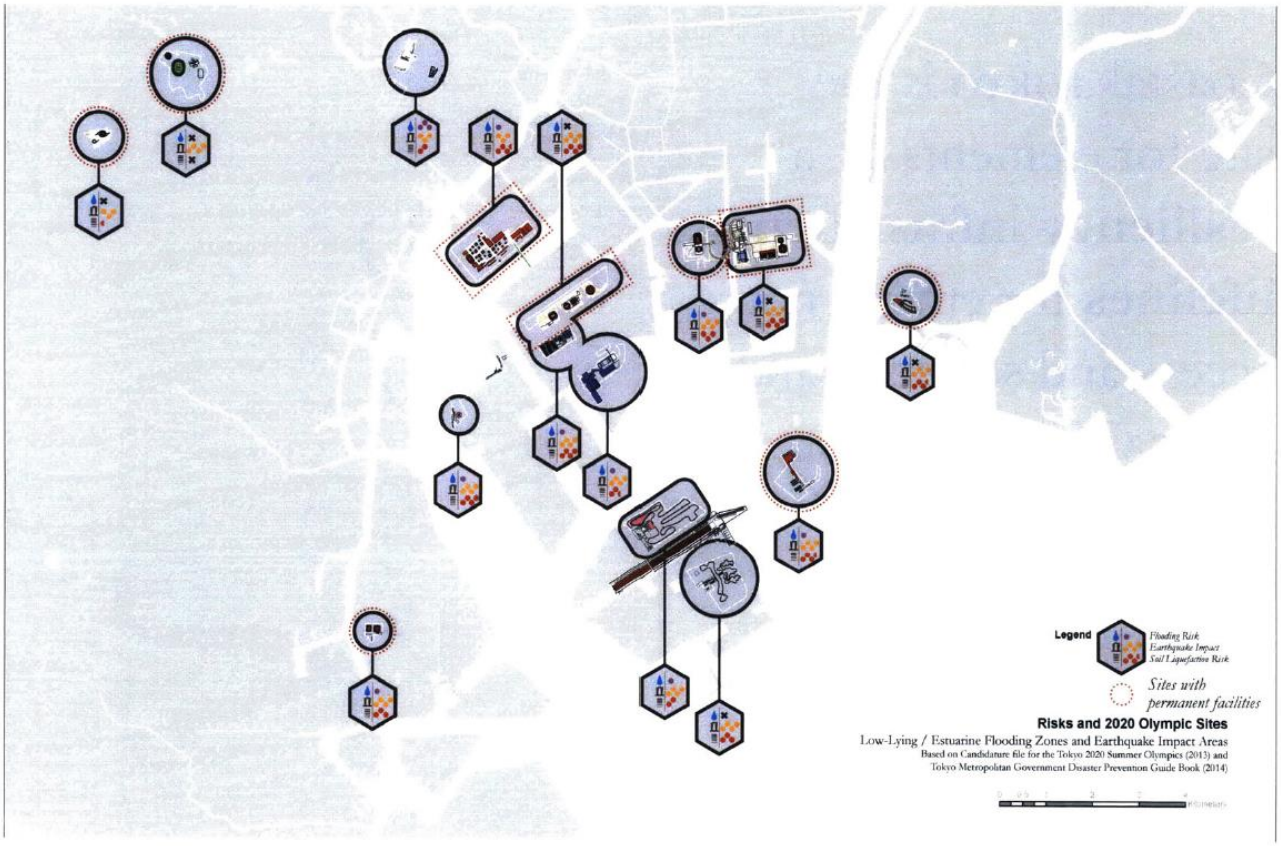

Figure 46. Risks and Tokyo 2020 Olympic sites in Tokyo Bay (Source: Oktem, 2016).

7. DISCUSSION AND CONCLUDING REMARKS

At the end of this research thesis, the time has come to carry out critical considerations on the themes explored in the work undertaken. In this final section, the main evidence and dynamics of the phenomenon analysed will be presented in different subsections that will facilitate the reading of the most significant results.

In the first subsection, the comparative analysis of the Tokyo, Rio and London plans will be deepened by adopting the previously proposed keys of interpretation (discourse, objectives and strategy, governance of the plan, tools implemented, and monitoring). In this way, it will be possible to catch similarities and differences between the different sustainable plans. As a logical consequence of the work carried out, the focus shifts to the case of Tokyo and the value of the plan and how it fits into the system of government of Japanese territory. Observations will be made on the elements of innovation introduced concerning previous editions and the weak points and those that have worked the most.

Finally, the focus will be shifted from the specific case to the general case, trying to outline the most evident and less obvious characteristics of the aspects related to sustainable urban policies interrelated with the phenomenon of mega-events. The discussion will end with some reflections suppressing the limits of the research, on the significant influence of the current sanitary emergency that has modified some expected results and on the possible future developments of the topic dealt with in the research work.

7.1. A comparative analysis of sustainability plans

As mentioned above, in order to feed future discussions and to conclude the comparative work that is the subject of the first step, it is useful to summarise the most relevant aspects of the plans analysed of the last three editions of the Olympic Games. The variables used are those shown in the table below (Table 14). It should be noted that the comparison of impacts is not reported as the Tokyo Games edition is not completed. Of course, the other variables are sufficient to understand the similarities or differences between the three sustainable plans.

	London	Rio	Tokyo
Discourse	Three dimensions of sustainability; urban regeneration in the Lower Lea Valley	Sustainable social and urban transformation setting new standards for event management	Adoptation of SDGs and pursuing pioneering solutions (IoT, Smart city, hydrogen systems)
Objectives and strategy	Five themes (Climate change, Waste, Biodiversity, Inclusion and Health living)	Three themes (Reduced environmental footprint, Games for all and Accountability)	Five themes (Climate change, Resource management, Biodiversity, Human rights and Engagement)
Governance	Sustainable Sourcing Code; Commission for a Sustainable London (consultative indipendent organisation); ISO 20121	Sustainable Sourcing Code; sustainability working group (public and private); ISO 20121	Sustainable Sourcing Code; Urban Planning and Sustainability Commission (public); ISO 20121
Tools	London Plan (Spatial Development Strategy for Greater London) and linked Master Plan	Law 12.035 'The Olympic Act' and Master Plan (Plano director)	NSSZ, TMG Master Plan, Environmental Master Plan, TMG Action and Legacy Plan
Monitoring	Programme reporting - Planning - Information gathering - Analysis - Reporting	Sustainable Management Plan - Sustainable Management System - Feedback - Monitoring	PDCA cycle (Plan - Do - Check - Act)

Table 14. Comparison between IOC's sustainability plans (Source: author elaboration).

Beginning with the different discourse, are present differences not so prominent in the conceptualisation of sustainability but rather in the scope of the plan and the possible solutions to achieve its objectives. In the case of London, the focus is on a specific area of the city to recover it thanks to its proximity to important infrastructures already present and through an already defined regeneration programme to add objectives linked also to the environmental and social sphere. Rio's intention is different, where the various actions are declined in numerous interventions scattered throughout the city with the ambition to increase the competitiveness of the city itself also through sustainable policies. Finally, there is the experience of Tokyo, a mature and extremely fragile context that tackles urban challenges using the most advanced technologies in terms of sustainable development.

As far as the part concerning the objectives and strategies is concerned, there are no particular differences: the themes dealt with in the objectives and strategies are very similar especially if one compares the experiences of London and Rio with the only peculiarity that the various objectives are organised differently (5 London themes versus 3 Rio themes) but this does not affect the contents which are similar in many parts. A different discourse for Tokyo that re-presents 5 themes and to each of them link the SDGs it intends to implement and reports many strategies present in urban planning documents before the plan itself. Similar situation regarding governance: in all cases, there is a defined international standard for sustainable event management (ISO 20121) and a precise sustainable sourcing code. Then, the monitoring process is subsequent at the event management above mentioned: the process or rather the cycle is almost the same with only the differences between labelling and actors involved. The stakeholders at stake do not differ much even though they may change their legal nature. In the case of London, the Commission for a Sustainable London, which is responsible for implement and monitoring sustainable actions, is an independent organisation in the field of advisory. About Rio, the same role is played by a specific sustainability working group which embraces public and private actors. Finally, Tokyo has as Urban Planning and Sustainability Commission which host several experts engaged through the central government. Finally, the key to the different approaches in the sustainability plans which are the tool implemented before and after the event. In this sense, wider considerations can be done albeit also, in this case, are present similarities such as the frequency of using Master Plans as the main tool to operationalize the plan's actions. The transformations envisioned for London are provided into a precise strategic framework (the London Plan); thus, the Olympic site is integrated into others urban regeneration programs with high environmental value (the East London Green Grid and the Green Enterprise District) which are declined in specific master plans. Instead, Rio practised extrajudicial and supra legal mechanisms such as Law 12.035 'The Olympic Act' and modified the urban master plan for the city including new building codes and zoning restrictions. In conclusion, the experience of Tokyo put in place a plethora of tools: from the National Strategic Special Zones (NSSZs) which create brand-new economic zones with business-friendly conditions by promoting bold deregulations to several plans established by the TMG that defined objectives strategies and actions for the management of Olympic Games and its legacy.

7.2. Focusing the Tokyo 2020 sustainability plan

Going into detail on the case of the Tokyo 2020 sustainable plan, some considerations are necessary to draw the sums to work. In this regard, it is reasonable to think about the potential added value of the plan although it includes targets that will be extended over the coming years. Undoubtedly, it draws on the experiences of London and Rio, not so much on the plan's management system that does not change significantly, but on some objectives that were not detailed in previous editions. For example, it refers to the insistence on maximising the use of existing structures and, should it be necessary to build them, to aim for temporary solutions. This is also the result of the so-called Olympic Agenda, which comes into play with the Japanese edition (although in a partial way since the strategies of the document were defined when the Tokyo bid took place). The plan has been part of the system of territorial governance since the creation of the Tokyo 2020 organizing committee and the latter is nothing other than a foundation of public interest established by the JOC and TMG; hence, the plan works as “policy-window” which can link the planning policies between the national government and the metropolitan government and help to implement metropolitan policies through the existing master plans which provide guidelines to the metropolitan and municipal zoning. As supervisor of this process there is the Urban Planning and Sustainability Commission which is one of the strongest points of the plan. In the public Commission, two groups address specific issues depending on themes; the Sustainability Discussion Group study precise issues and monitor the progress of sustainability efforts, and the Working Group analyses issues from a more technical perspective. In terms of innovation, the plan aims to be a learning legacy that will be used for sustainable Olympic and Paralympic Games planning and operations and for this purpose the legacy plan “Towards 2020: Building the Legacy” formulated in 2015 by TMG underlined all the initiatives linked to the post-Games legacy such as the Athletes’ Village uses, culture, education, the environment, economy, and recovery of the areas affected by major disasters in recent years. Furthermore, pursue innovative approaches and concept linked to sustainable development as hydrogen society, smart projects and IoT above all which can inspire the next generation of IOC’s sustainability plans.

Improvements are always possible, especially if the processes illustrated in the plans are not mature and sufficiently tested. Above all, one aspect that still does not work perfectly is the discrepancy between the policies defined at the time of the bid and the policies that are

translated into the various town planning plans. As an example, Figure 47 shows the progress made in March 2019 on policies to tackle climate change: a relevant number of final policies can be seen under consideration. This may influence the various monitoring and impact assessment procedures. As a weak aspect, it is possible to denote marginal attention to the social sphere, especially related to the gender equality: the plan strongly aims at integration and participation of the population in the preparation and during the event, but it does not mention how to maintain possible results achieved in this field, and the contemporary feeble presence in the legacy plan is an evident proof.

Progress at a glance

Item		Target	Progress
Emissions Avoidance		Strategic venue planning for the maximum use of existing venues and public transport networks	Venue planning is complete
		Ensuring high environmental performances in the construction of venues	Underway in accordance with venue development plan
		Maximum procurement of materials and items with high environmental performances	Final policy under consideration
Reduction of Emissions	Reduction measures	Construction of venues by effectively using energy saving technologies	Underway in accordance with venue development plan
		Maximum use of facilities and equipment with high energy efficiency	Final policy under consideration
		The implementation of energy management in venue operations, and the installation and use of BEMS in new permanent venues	BEMS installation underway
		Reduction of CO_2 emissions through recycled use of items as much as possible	Final policy under consideration
		Promotion of transport with lower environmental load	Final policy under consideration
		Maximum reduction of greenhouse gases (GHGs) (e.g. hydrofluorocarbons (HFCs))	Final policy under consideration
	Renewable Energy	Installation of facilities that use renewable energies in permanent venues	Underway in accordance with venue development plan
		Maximum use of renewable energy	Approach determined, adoption underway
Offset, etc.		Implementation of offset for CO_2 and other greenhouse gases that are inevitably emitted even with the implementation of elimination/ reduction measures of emissions	Initiative launched and underway

Figure 47. Progress report about climate change policies (Source: Tokyo 2020, 2019).

7.3. Enabling sustainable policies through mega events: clear and hidden aspects

From these last considerations, it was possible to get to discover the latest trend of mega-events which want to be sustainable. In this case, the Olympic Games are more than a bare event that follows the intentions of private actors which pursue only economic development that takes place in an environment of urban competitiveness. In terms of urban governance, it is no doubt premature to say that the era of uncontrolled urban entrepreneurialism has given way to a new phase of ecologically sensitive development. In some cities, however, the two forms of governance often coexist; the two ideas are not strictly opposed, and not strictly superimposed, but are certainly linked by a complex relationship. In other words, it can be said that 'sustainability is an important key to competitiveness today' (Crivello, 2012). Even the mega-events, historically global events that aim to spot the city interested in the global urban market, competitively follow sustainable principles. Accordingly, the IOC decided to adopt the SDGs included in the New Urban Agenda (NUA). This agenda sets out the goals for urban sustainable development within the UN's overall 2030 development framework. The NUA acknowledges that implementing and financing urban sustainability cannot be borne by urban governments alone but will need strong commitments from civil society actors and especially the private sector. From the latter statement, it is possible to argue that IOC and its Olympic Games is one of the possible options for enabling specific SDGs helping the development of existing sustainable policies. Precisely, IOC follows this behaviour through the Olympic Agenda and the singular sustainability plan for each edition. Thus, the sustainability plan, which is the operational tool, is influenced by sustainable policies introduced by strategic plans (in the cases analysed at metropolitan level) and at the same time influence the effective management of Olympic Games and future legacy actions. Furthermore, the Organising Committees of the Olympic Games, host cities and their delivery partners move on the process of implementation of sustainable actions which must respect the strategy lines made by the IOC. This aspect guarantees an interesting domestic production of different discourse and the relative main objective of the sustainability plan: London and Rio focus on the urban regeneration of disadvantage areas while Tokyo wants to develop policies to reach the smart city concept linked to the use of technologies which aim to improve the economy, quality of life and environmental conditions.

If there is a list of notable characters, following it is required to resume the hidden aspects; policymakers of mega sports events tend to focus their strategies and policies on minimising the impacts to the physical environment (i.e., natural resources such as air and water, event-related pollution from the construction of facilities and transportation and management of waste). Nevertheless, there are other areas within the general concept of Olympic Games sustainability that are often overlooked in the interest of preserving the natural environment in the run up to, and during, the event. For example, other equally significant environmental impacts that are concerned with the host community such as community displacement (e.g. the case of Vila Autódromo in Rio), uneven distribution of benefits, Olympic spending compromising spending for the community, quality of life for residents, use of facilities after the event, and human rights such as cases of migrant worker exploitation among temporary agency staff in London (Konstantaki, 2018).

Overall, after the critical review one question was unsolved: can the impact and development generated be sustainable and then can sustainable policies be promoted? Above some aspects were dealt concerning the impact and according to the cases of London and Rio and also to the hidden effects of mega-events it is hard to affirm that the legacy of Olympic Games can be sustainable in all the three dimensions that it is possible to consider. Instead, about the promotion of sustainable policies, the result is different according to the Japanese context even because the different government of host cities consider Olympic Games as the driver for urban innovation in several fields including urban sustainability for guarantee competitiveness in the global stage and more liveability in modern cities.

7.4. Limits of adopted approach and research perspective

The methodology adopted has made it possible to outline a general framework of the new trend of mega-events to embrace the concept of sustainable development, questioning regarding more arrangements satisfactory to maximize this dynamic from a planning point of view. The study of the dynamics that develop it originated around the theme starting from the observation of international debate on mega-events, and the key points for implementing actions for sustainable development, proposed from the New Urban Agenda via SDGs.
It was also possible to analyse the evolution of the concept of sustainability in the various editions of the Olympic Games and to better understand a new tool proposed by the IOC as the sustainable plan by studying the cases of London and Rio. The Japanese case study was identified for its particular context because pursue the development of environmental and sustainable policies, especially at the metropolitan level, and in the meantime tries to strengthen its figure of a global city by hosting the Olympic Games. Nevertheless, this methodology is not satisfactory to represent the full analysis and interpretation of the phenomenon. It should be remarked that if from, on the one hand, this type of methodology made it possible to describe, analyse and compare the various sustainable plans in an analytical way for getting knowledge about a recent tool; on the other hand, it did not make it possible to verify how the urban planning tools could have translated the objectives set out in the sustainability plan also due to the current situation of the COVID-19 which influenced the part related to the interviews and face-to-face interaction, relevant for completing understanding the governance mechanism and the production of plans linked to the sustainability plan. Some progress documents were postponed and most of the different perspectives that research abroad can offer, and which may enrich the research are not present in the research. Thus, previous the sanitary emergency the work was founded and oriented to analyse deeply the case of Tokyo and according to the impossibility to reach the city interested and pursue studies field the structure was changed to a comparative analysis between plans. This methodology has allowed a merely cognitive review of the various aspects dealing with the IOC sustainability plan which is a result of the indications included in the Olympic Agenda inspired by the SDGs. Specifically, it will be possible in hypothetical future research to proceed the work began and reach a wider and more comprehensive knowledge of the phenomenon especially on the side of territorial plans that influence the objectives of the IOC sustainability plan. Thus, more focuses on specific cases studio are needed to evaluate better the impact produced before, during and above all after the event.

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