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"ENVIRONMENTAL OLYMPISM": PERSPECTIVES IN SPORTS, OLYMPIC EDUCATION AND CULTURE

By

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MASTER Dissertation submitted to the professorial body for the partial fulfillment of obligations for the awarding of a post-graduate title in the Post-graduate Programme, "Organization and Management of Olympic Events" of the University of the Peloponnese

Sparta 2021

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Picture – 1 – AMBU

On a flat and desolate landscape a suffering human face. From the first a second character with a female face takes shape. Behind her an hand tries to support the planet.
(Sculpture conceived by the author of this thesis and commissioned to the Sardinian sculptor Ambu, who made it on wooden logs obtained from trees burned during the terrible fires in Sardinia).
The artist's surname "Ambu" means "both". The same name attributed to the sculpture refers to the aspiration to balance between humanity and nature

ABSTRACT

David Grassi: “Environmental Olympism”: perspectives in sports, Olympic education and culture

(Under the supervision of Heather REID, Professor)

To become a pillar of the Olympic movement, environmentalism should be explicitly stated in the Fundamental Principles of Olympism. It is not just a matter of recognizing the central role of the planet earth as the home of humanity based on the core values of excellence, respect and friendship. Environmental protection should be guaranteed through changes in the practice of sport, Olympic education, and culture, which can be derived directly from the definition of Olympism.

KEY WORDS:

olympism; environment; sustainability; sport.

SUMMARY

In the last 50 years there has been an increase in awareness of environmental issues, evident from the growing number of publications, compared to other fields of study)[1].

Olympism, in the last decade of the twentieth century, chose the environment as its third pillar (IOC, 2012c), committing itself to protecting it through sport.

At the international level there has been a gradual change of perspective and the centrality of the environmental drive is now shared together with the economic and social dimension of sustainable development (UNEP, 2013, p. iii).

In 2015, the United Nations (UN) reached an agreement for a sustainable development program divided into 17 objectives (United Nations, 2015). These have been made operational with indicators to assess the degree of implementation achieved. The close relationship between all objectives in the three dimensions requires that all countries, governments and organizations communicate and cooperate in solidarity (Grassi, 2019, p. 73). The Sustainable Development Goals (SDGs) should be seen as integrated and indivisible (Lindsey & Darby, 2018).

Satisfying all needs in a balanced way, from the local to the global level, means understanding and anticipating the evolution of complex systems, whose definition, functioning, variables and how they interact are neither known nor easy to understand. (Ladyman, Lambert, & Wiesner, 2013). Consequently, all solutions present a certain degree of uncertainty and do not always satisfy everyone. For example, regulating a fishing area, limiting emissions, establishing industrial production standards may have opponents while the effects of appropriate regulations are not always immediately evident and do not always lead to local benefits. From this derives slowness or even reticence in the decision-making processes on the part of political leaders and it is possible the prevalence of divisive choices and not very incisive actions as their effects do not always fall directly on the territory in which they take place, whether positive or negative (Willett, et al., 2019).

Sport is also linked to all sustainable development goals (UNOSDP, n.d.) and to the social, economic and political fabric (UNEP, n.a., p. 207), from small local sports clubs to the international level of the federations and the Olympic committee. The possibility of contributing to sustainable development is the current challenge of Olympism. It is consistent with the ambition to provide a service to humanity and to unite it for the common interest, in a spirit of friendship and cooperation.

[1] See Figure 1 page 159

The International Olympic Committee (IOC) has promoted studies, publications and initiatives aimed at the sustainability of sport but there is still no accurate and shared system for measuring the individual environmental footprint in the most of the sport related activities (Wicker, 2017, p. 17) and of those "*generated by each separate operation and practice of the sport industry and events*" (Triantafyllidis, 2020).

The organization of the Olympic Games constitutes the most evident commitment of Olympism on the international stage. The viability and sustainability of OGs should be supported by evidence of their positive legacy, both tangible and intangible, which has been a goal since the 1980s (Leopkey, 2012) but was explicitly stated for the first time by the Atlanta Committee for the Olympic Games (ACOG):

> "*In 1993, the ACOG Board of Directors adopted a mission statement to guide ACOG planning and decision making that pledged:... to leave a positive physical and spiritual legacy and an indelible mark on Olympic history by staging the most memorable Olympic Games ever.* (ACOG, 1996, p. 20).

The assessment of the environmental impact of sport and the Olympic Games (OGs) remains a controversial field and there is a lack of tools and data for even the simplest cases. Sport is estimated to be responsible for 7% (Triantafyllidis, Ries, & Kaplanidou, 2018) of greenhouse gas emissions for spectator travel alone.

Drawing inspiration from the literature, we will discuss the close link between sport and the environment, environmental education, approaches and technologies useful for reducing environmental impact, the assessment of the legacy of the OGs.

The results of this work indicate the opportunity to modify the Olympic Charter (OC) by expressly introducing the environment among the fundamental principles. Olympic education should make greater use of experience in nature to develop practitioners' environmental awareness. In the practice of sport at all levels, impact measurement protocols and implementation programs for sustainability-oriented practices with related deadlines are urgently needed. For the organization of sustainable Olympic Games, the new process cycle that follows from the recent strategic documents of the IOC on sustainability and legacy should be monitored in order to ensure their implementation.

ACKNOWLEDGEMENTS

I dedicate this work to 4 trees.

While I was working on this document, 4 trees sequestered the CO_2 that my work released into the atmosphere.

Picture – 2 – Trees - Among the other trees, for its venerable age of 4000 years, the olive tree of Luras (Sardinia) stands out

Unfortunately, I know that they too were already very busy, and I don't think they were able to take on this additional burden of work.

We need too many trees to sequester CO_2. In addition, we are sacrificing many living species, water, air and soil and this could backfire on us.

Until environmentally sustainable solutions are available, we should consider refraining from unnecessary activities, making responsible choices.

This elaborate today is not sustainable and it is not necessary[2].

I have generated an additional carbon footprint by anticipating some environmental resources that do not belong to me. I am guilty of this environmental impact and the only and authentic possibility to remedy is to leave this legacy: may what I have written convince other people to adopt more responsible behavior towards the environment. Not considering it right to ask others to do my part, I begin to do it myself.

Thanks again to the 4 trees.

[2] I am referring to a global perspective, as this paper is required by the academic curriculum.

Estimating carbon foot print of this work

The writing of this thesis took about 900 hours. Unfortunately, my efficiency is very modest.

This means that I used my laptop, a second screen and the light for the room, with a consumption of (0.06 + 0.045 + 0.015) Kw/h x 900 h = 108 Kw / h.

In Italy, the carbon footprint per kw / h of electricity is approximately 0.470 kg / Kw / h. This means that to keep the laptop, second monitor, and room light on, I determined a carbon footprint of 50.7kg of CO_2 (ISPRA, 2020).

To this I have to add 7.1 kg of CO_2 as part of the carbon footprint to produce the laptop. For the production there is an estimated 119 kg of CO_2 (Manne, 2020). I estimate to use it for 5 years; in the 6 month period the use of the laptop was of the 60% dedicated to the thesis therefore: 119 kg / 60 months x 6 months x 60% = 7.1 kg / CO_2).

I do not consider the printed books I have used. In fact, it is controversial whether paper production can contribute to CO_2 sequestration from the atmosphere, and I do not know how they were produced (Wells, Boucher, Laurent, & Villeneuve, 2012). I will not even consider the 3 prints and 2 CDs that this official document will require.

Thus, the total (underestimated) CO_2 released into the atmosphere is about 57.8 kg.

Considering that a tree can sequester on average 25 kg of CO_2 per year from the atmosphere (Egbuche, 2018) (Fransen, 2019), it will take 2.3 trees for a year or 4.6 trees for the duration of the time I worked on the document in order to have a net CO_2 zero balance.

Considering that it is controversial whether I should attribute part of the CO_2 footprint linked to the production of the laptop to the fact that I used it to write the thesis, I could only consider a carbon footprint of about 50 kg, so 2 trees for a year or 4 trees for the period I worked on the document.

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LIST OF TABLES, FIGURES, PICTURES AND FOOTNOTES

LIST OF ABBREVIATIONS

ACOG	Atlanta Committee for the Olympic Games
AISTS	Academie Internationale des Sciences et Techniques du Sport
ANSA	Agenzia Nazionale Stampa Associata (Italian National Associated Press Agency)
BACI	Before and After Control Impact
BOCOG	Beijing Organising Committee for the Games of the XXIX Olympiad
CEDEFOP	European Center for the Development of Vocational Training
CEESP	Commission for Environmental, Economic and Social Policy
CCS	Carbon dioxide (CO_2) Capture and Storage
CO_2	Carbon dioxide
COVID 19	COronaVIrus Deseas 19
CRM	Cause Related Marketing
CSE	Corporate Sustainability Effort
CSL	Commission for a Sustainable London
CSR	Corporate Social Responsibility
CIA	European Economic Community
EF	Ecological Footprint
EFI	Education For Information
EIA	Environmental Impact Assessment
EIGE	European Institute for Gender Equality
EN	ENvironmental indicator
ENVIO	Ecological Footprint and Environmental Input-Output analysis
EPRS	European Parliamentary Research Service
ESD	Education for Sustainable Development
FI	International Sport Federation
FIFA	Fédération Internationale de Football Association
FWC	Fifa World Cup
FP	Fundamental Principles (of the OC)
G7	Group of Seven (Canada, France, Germany, Italy, Japan, the United Kingdom and the United States)
G8	Group of Eight (Canada, France, Germany, Italy, Japan, the United Kingdom and the United States + Russia)

GCED	Global Citizenship EDucation
GDP	Gross Domestic Product
GI	Global Indicator
GITI	Global Indicator Thematic Indicators
GP	Green Peace
IAKS	International Association for Sports and Leisure Facilities
ICRC	International Committee of the Red Crossion
ICSSPE	International Council of Sport Science and Physical Education
IF	International Federation
IMF	International Monetary Fund
IOA	International Olympic Academy
IOC	International Olympic Committee
IPCC	Intergovernmental Panel on Climate Change
ISBN	International Standard Book Number
ISO	International Organization for Standardization
IUCN	International Union for Conservation of Nature
IUPUI	Indiana University-Purdue University Indianapolis
LEED	Leadership in Energy and Environmental Design
LOCOG	London Organization Committee of Olympic Games
MCA	Multi-Criteria Analysis
NBA	National Basketball Association
NF	National Sport Federation
NHL	National Hockey League (US-Canada)
NOA	National Olympic Academy
NOC	National Olympic Commettee
OAS	Outodoor Adventure Sport
OC	Olympic Charter
OCOG	Organization Committee of Olympic Games
OGGI	Olympic Games Global Impact
OGI	Olympic Games Impact
OGs	Olympic Games

OM	Olympic Movement
OVEP	Olympic Values Education Programme
PPP	Planet, People, Profit
RMCF	Real Madrid Club de Fútbol
SDG	Sustainable Development Goal
SDGF	Sustainable Development Goals Fund
SEC	Sport and Environment Commission
SLC	Sustainability and Legacy Commission
TOK	Transfer of Knowledge
TOCOG	Tokyo Organization Committee of Olympic Games
UEFA	Union of European Football Associations
UCL	UEFA Champions League
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNOSDP	United Nations Office On Sport for Development and Peace
USA	United States of America
USD	United States Dollar
USGBD	U.S. Green Building Council
WCED	World Commission on Environment and Development
WFSGI	World Federation of the Sporting Goods Industries
WHO	World Health Organization
WUOC	World Union of Olympic Cities
WWF	World Wide Fund for Nature

CHAPTER I.

THE ENVIRONMENTALISM IN THE OLYMPIC CHARTER

1.1 The Olympic Charter

The Olympic Charter (OC) is the document which guides the Olympic Movement. The first pages declare the Fundamental Principles (FP) of Olympic philosophy, the main references to guide any decisions and actions. The latest edition was promulgated in July 2020 (IOC, 2020).

The IOC has a continuous production of documents that constitute a reference about the activities in progress and planned.

In 1994, the IOC began to *"embrace sustainable development as part of its core mission"* and in 1995 the IOC made *"environment the third "pillar" of the Olympic Movement, alongside sport and culture"* (IOC, 2012c).

The OC does not contain such clear statements, therefore it does not indicate that the environment is the third pillar of Olympism, but the word "environment" is used in a single sentence, within the scope and role of the IOC which provides cue to introduce the topic of the next paragraph.

1.2 Mission and role of the International Olympic Committee

The first time the word "environment" is mentioned in OC is in the edition of 1991.

The IOC:

- *sees to it that the Olympic Games are held in conditions which demonstrate a responsible concern for environmental issues* (IOC, 1991, p. 9).

In the Olympic Centenary, in 1994, a celebratory Congress was held in Paris in which the IOC recognized the importance of the environment and sustainable development. In the next edition of the OC, in 1996, a paragraph on environmental protection was added to the Olympic Charter.

The IOC:

- *sees to it that the Olympic Games are held in conditions which demonstrate a responsible concern for environmental issues and encourages the Olympic Movement*

to demonstrate a responsible concern for environmental issues, takes measures to reflect such concern in its activities and educates all those connected with the Olympic Movement as to the importance of sustainable development (IOC, 1996, p. 11).

With the OC – 2004 there was the second and last change:

The role of IOC is:

- *to encourage and support a responsible concern for environmental issues, to promote sustainable development in sport and to require that the Olympic Games are held accordingly* (IOC, 2004, p. 12).

The commitments declared by the IOC are consistent with environmentalism and the involvement of the Olympic movement will be required to address them. Before seeing how, I present some considerations.

The first task ("*to encourage and support a responsible concern for environmental issues*") does not refer to education in terms of information, but requires responsible behavior and therefore participation in the objective, even if the IOC should use more active verbs compared to "encourage" and "support" (as well as to "promote" used shortly after) (Swatuk, 2020, p. 25).

I argue that the perception of the state of conservation of the environment and the problems connected to it depend on the context, on social and cultural values, on political actions. Communication plays a key role as people cannot always directly as certain the anthropogenic causes and environmental effects, especially where there is no direct contact with the places where the damage occurs. While the media facilitate the communication of this evidence, for example through images of what is happening in distant places on the planet, people should be guided towards understanding phenomena concerning the natural environment and how the related knowledge can be applied in the own context of life. Furthermore, solid moral and normative foundations are needed to correctly address behavior. All these conditions determine what I could call environmental awareness.

Therefore, I believe that in order to implement what has been declared, the IOC should provide specific ecological elements of information. Appropriate knowledge

should stimulate concern and then awareness of the need for behavior consistent with respect for the environment.

To make the second task effective ("*to promote sustainable development in sport*") I argue that two distinct and successive steps should be considered:

- by applying the definition of "sustainable development" **in** sport, it follows that the opportunities of future generations to devote themselves with pleasure to a sporting discipline should be left intact, without pushing them to train more and more intense and to resort to better technology, aspects responsible for affecting their possibilities and making their effort "unsustainable". Loland (Loland, 2006) suggests, especially for the so-called performance sports with records, how they should be modified to safeguard the notable contributions to the growth of the person that derive from the practice of sport without reducing it to the improvement of an increasingly demanding record;
- extend the concept of sustainable development of sport with respect to its own ability not to cause environmental damage. This second aspect, which will be better addressed later, is certainly the one the IOC should deal with, given that environmental protection has now entered the Olympic Charter since 1991 as in many other official documents.

Finally, the third task ("*to require that the Olympic Games are held accordingly"*) goes beyond the union of "*to encourage and support a responsible concern for environmental issues*" and "*to promote sustainable development in sport*" and corresponds to organizing environmentally sustainable Games.

Having become aware of the environmental commitments indicated in the Olympic Charter and pertaining to the IOC, we will see how they are addressed.

1.3 Does sport have a problem with the environment?

It needs to be clarified whether the IOC should care about the environment by looking for answers to the following questions (the first posed in rhetorical form):

1. Is it possible that the IOC could be exempted from addressing environmental sustainability? If so, why would the IOC claim to be concerned with it instead of just

using sport to spread Olympism and focus on its mission by letting someone else deal with the environmental side effects this could cause?

2. How should sport be changed to better achieve the expected result, assuming that the requirement can be met?
3. Furthermore, how can it ensure that the Olympic Games are held as stipulated in the above sentence of the Olympic Charter? Does the IOC do whatever it takes?

The answer to the first question is inherent in the fact that the OM has declared the environment as its third pillar and therefore has decided to engage in the environment. The origin of this commitment requires introducing some key historical passages listed below.

At the 1992 Summit in Rio de Janeiro, the United Nations Conference on Environment and Development (UNCED) has adopted Agenda 21, a global action strategy that aims to promote economic development in a manner consistent with the protection of the earth's environment (UNCED, 1991, p. 64-75). Everyone is recommended to carry out its activities in accordance to its different situation (p. 3 - point 1.6). The Olympic Movement, based on this recommendation and consistent with the FP3 and FP6 of the Olympic Charter, has accepted its responsibility in the implementation of the global action (IOC, 1999, p. 18).

Given the potential of sport to produce an environmental footprint, the IOC's statement to address the issue of sustainability in sport is consistent with taking its own responsibility. To translate the task into action it is necessary to identify all aspects that contribute to the environmental footprint of sport. Each aspect will require a critical assessment of how, what and to what extent it is already being done and, if this is not sufficient or correct, it will be necessary to study how and what remains to be done, identify who will do it and establish measurable objectives to be achieved in times to be established.

As as mentioned above, we need to refer to the fundamental principles to find inspiration.

1.4 Fundamental Principles

In FP1 we read: "*Olympism is a philosophy of life, exalting and combining in a balanced whole the qualities of body, will and mind. Blending sport with culture and education, Olympism seeks to create a way of life based on the joy of effort, the educational value of good example, social responsibility and respect for universal fundamental ethical principles*." (IOC, 2020 – Olympic Charter)

Given the breadth of this statement, without any reference to the environment being present, it is necessary to verify whether respect for the environment is part of compliance with "universal fundamental ethical principles."

"*These principles incorporate a set of values that the International Olympic Committee refers to as "The educational themes of Olympism*" (IOC, 2017a, p. 16).
"Excellence respect and friendship are the three core values of olympism" (p. 17).

- ***Excellence:*** *it means doing the best we can, on the field of play or in our professional life. The important thing is not winning, but taking part, making progress and enjoying the healthy combination of body, will and mind* (p. 17).

  Scientific evidence supports the direct relationship between health and environment (UNEP, 2021) that should be preserved to pursue the healthy balance of human qualities, the declared prerequisite of excellence.

- ***Respect:*** *This includes respect for yourself and your body, for other people, for rules and regulations, for sport and for the environment* (p. 17).

  By preserving public health, the intact environment contributes to respect for others.

- ***Friendship*** *is at the heart of the Olympic Movement. It encourages us to see sport as an instrument for mutual understanding between individuals, and between people all over the world* (p. 17).

  A healthy environment is a prerequisite for the prosperity of any nation. Therefore, it has the potential to prevent conflicts due to lack of access to resources, including safe food and water, and to preserve peace. "*Environment and peace are cross-cutting and relevant in all areas of conservation, sustainable development and security*" (IUCN, 2021)**.** Taking care of the environment also means acting in the interests of others, a behavior that fosters friendship.

In conclusion, I can say that preserving the integrity of the environment could be set out in the fundamental principles of the Olympic Charter. This is because it helps to preserve the health of the body, which with mind and will contributes to excellence; it also reduces conflicts and therefore facilitates friendship; finally, respect for the environment also entails respect for others who can benefit from its integrity.

1.5 Link between environment and sport

I verified that there is coherence between Olympism and respect for the environment and below I will try to verify if there is also a direct link between sport and the environment. I will do this as in FP2 we read:

> *"The goal of Olympism is to place sport at the service of the harmonious development of humankind, with a view to promoting a peaceful society concerned with the preservation of human dignity"* (IOC, 2020, p. 11).

In order to verify the relationship between sport and the environment, I will consider two perspectives:

- the consequences of environmental change for sport;
- the impact of sport on the environment.

Numerous studies correlate climate change with the actual possibility of practicing sports. This is true both in winter sports where, for example, there is a decrease in the number of days in which it is possible to ski, (Wobus, et al., 2017, p. 1) and in summer sports, with athletes exposed to the negative effects of excessive temperatures (Galloway & Maughan, 1997, p. 1240). The incidence of extreme weather phenomena determines an increasing number of cancellations or displacements of events, with domino effects on sports calendars or the need for ever greater organizational efforts and use of resources (use of artificial snow or construction of structures indoors with huge air conditioning systems). These phenomena also determine the reduction in the number of sites where sporting events can be profitably organized that should be scheduled in the calendars of the federations, including the possibility of many countries of the world to host the OGs (Scott, Steiger, Rutty, & Johnson, 2015). The number of sites is destined to decrease also due to the possibility of a rise in the seas, which is expected to engulf entire cities and the infrastructures that host sporting events (Wilson & Millington, 2019). The impact of weather on sport can be further distinguished in the impact on athletes in terms of health and performance (Watanabe, Wicker, & Yan, 2017), (Ely, Cheuvront, Roberts, & Montain, 2007), (Knechtle, et al., 2019) and in that on spectators (Thornes, 1977, p. 266).
To the phenomenon of climate change should be added the threat of pollution: swimming in polluted waters, running marathons or participating in sporting events in places where the air is polluted constitutes a factor of exposure to damage to health and compromises performance. (Lichtera, Pestel, & Sommer, 2017). It should be added that in some cases, because of exceptional climatic phenomena such as extreme drought, there are large fires,

capable of causing the cancellation of sporting events or serious effects on their organization. A major fire impacted the Australian Open tennis tournament in January 2020 (Crabtree-Hanningan, 2020).

As for the impact of sport on the environment, it should be assessed over time as in the case of the life cycle of sports facilities. In CHAPTER II and in A.2 all the main aspects that contribute to the environmental impact of sport will be addressed.
Previously I had verified the link that exists between Olympism and the environment. Now I have verified that sport can suffer the negative effects of a degraded environment as well as pose a threat to the environment itself. Since Olympism has declared that it wants to use sport to achieve its ends, it should take care of protecting sport and therefore the environment.

1.6 Additional considerations

Olympism declares (FP4) [3] that "*the practice of sport is a human right*". The Universal Declaration of Human Rights (UDHR) (United Nations, 1948) does not mention sport among the inalienable rights and this is not the place to discuss whether the right to sport integrates the right to culture and freedom of expression and whether it exists *rerum natura*. Since the IOC recognizes this right, its mission is to make it effective for everyone.
In addition, as stated in FP 1 (and confirmed in FP2, 4 and 5), sport is the means that Olympism has chosen, together with culture and education, to better affirm its philosophy of life.
We also know that sport competes for the same resources required by other human activities: it requires plants, these require soil, they consume energy; moreover, the means of transport for athletes and spectators are required to participate in competitions; athletes use specific sports equipment. We also know that the planet earth can ensure limited resources, in a temporal perspective, compared to the growing demands of humanity.
To peacefully deserve the resources it needs to ensure the effectiveness of the right it recognizes to practice sport, Olympic Movement should demonstrate not only not to impoverish the environment with the risk of damage and loss of other human rights but

[3] *"The practice of sport is a human right. Every individual must have the possibility of practising sport, without discrimination of any kind and in the Olympic spirit, which requires mutual understanding with a spirit of friendship, solidarity and fairplay."*

also to support a responsible concern for environmental issues that would otherwise jeopardize the practice of sport.

1.7 Conclusions

Finally, Olympism, given the previous analysis, requires us to combine respect for the environment with sport, **as a human right** and as a further means to realize its way of life.

Olympism, as far as I can deduct from the Olympic Charter where the IOC claims to care for the environment, needs to safeguard the environment and for this reason the IOC has also declared it the third pillar of Olympism (IOC, 2012c).

The fact that it is identified as a pillar suggests whether it should be understood in a utilitarian way for the purposes of Olympism or as part of universal ethical principles.

The OC statements should therefore be made effective as soon as possible to keep up with the times. Thomas Bach, president of IOC, said in his speech at the opening ceremony of the 127th session of the IOC (2014):

> "*This society is changing faster than ever. This society will not wait for sport to change*".

CHAPTER II.

SEIZE THE OPPORTUNITY

In the previous CHAPTER I, I showed that the environment and Olympics should go hand in hand and so should the environment and sport. This is consistent with the statement that the environment is its third pillar and that the IOC cares about it. Now I will try to highlight the overlapping links of sport with the use of resources which should be considered for the purposes of environmental protection. The staging of sporting events does not only concern athletes and the playing field but involves many production and consumption chains. The United Nations strategy requires a sharing of responsibilities and therefore Olympism is called to commit itself to the sustainable development of all activities that make the practice of sport possible.

The challenge of sustainability constitutes an opportunity for the OM to contribute to achieving its goal of placing sport at the service of humanity for a more equitable and safer world. I will try to base this opportunity on the potential of sport to guide changes in society and the formal recognition of this role, beyond commonplaces. The main links between sport and the environment will be outlined and the hypotheses that should guide the commitment to preserve an intact environment.

In the form of a table (Table 1), I will present many areas of overlap between aspects of sporting practice and anthropogenic effects on the environment, summarily indicating which tasks each of the three organizational levels of the OM can perform. The topic is addressed discursively in Appendix A.2 from page 120.

The implementation of all the measures indicated in the table would make it possible to significantly reduce the environmental impact of all the activities that contribute to “producing” sport and the environmental impact of sport itself.

2.1 Free the OM from clicés to better exercise its responsability

In the first part of this paragraph I will try to demonstrate that to strive for sustainability in sport it is necessary to involve the largest number of people and I will discuss the difficulties that should be faced and what compromises should be accepted. In the second part I will show that at the global level, and therefore the IOC, it is the responsibility of compensating for the environmental effects of sport that cannot be resolved locally. I will

conclude that, in order to achieve the goal of sustainability in sport, it is necessary to ensure that the entire Olympic movement is involved and that the IOC takes on specific responsibilities to globally meet the criterion of sustainability in sport.

Connect and engage people

Even if sport involves many people, this does not automatically make it the best means of transmitting culture as this requires appropriate precautions.

Sport navigates a channel full of pitfalls. The interference of social and political realities of many countries and ideologies even in serious opposition to the values declared by Olympism, including individual economic interests, bad messages transmitted and behaviors sometimes held by those who practice or deal with sports, have the potential to generate enormous educational damage.

As we will see beyond (chapter 3.2.1) the possibility of sending the same message to everyone has proved not to be the most effective solution (Trail & McCullough, 2020, p. 135). The messages to be effective and bring about changes in people’s lifestyle should be personalized and based on the level of competence achieved with respect to the problem that is being addressed. This would require clustering the message recipients to give each the appropriate message. This activity requires profiling. Given the heterogeneity of the people involved in the sporting phenomenon it is difficult to inform everyone in the appropriate way and at the same moment.

Moreover, precisely because it involves many people every day and organizes sporting events, some of which are mega events, sport has the potential to generate a serious environmental impact capable of compromising its credibility as a virtuous phenomenon active for sustainable development.

Human beings are much more united by sharing the planet than by the heterogeneous phenomenon of sport. Local, social, cultural and work aspects have their effects on sports participation and undermine the IOC’s ability to face the global challenge of sustainability with a unified strategy, just as it is difficult for the United Nations. The IOC has the opportunity to work globally despite the fragmentation scenario of federations’ interests at all levels and places.

The UNEP recognized that:

> *It is important to be aware that there are limitations to peace-building through sport. In the words of one scholar — "[s]port is neither essentially good nor bad. It is a social construct and its role and function depends largely on what we make of it and how it is consumed"* (UNEP, n.a., p. 208).

The United Nations (UN) has recognized that good governance of sport, even in the contexts of a divided and conflicted world, has provided opportunities to softly address many issues, from health and lifestyle to effective social and cultural relationships. These evidences and results have led the UN to attribute a significant role to sport in spreading awareness on sustainability issues (Swatuk, 2020).

To make the most of the opportunity of this recognition and its potential to reach a vast number of people the IOC cannot even refrain from taking an active part in its declared commitment to act for the protection of the environment, a mission that can determine the future of OM.

Above all, a sentence can well summarize how the international community was able to cause such serious environmental damage despite good intentions: "*One of the reasons why so little has been done to stop climate change is that everyone makes an exception for themselves*" (Monbiot, 2006, p. 23).

The previous sentence highlights the tendency of people to seek compromises by working on the pros and cons and on the use of resources in their marginal portion from whose availability they make their own decisions, rather than adopting all or nothing solutions. This justifies the need to promote awareness on environmental issues: consumers with their behavior will be able to act as a lever for the production system, which still pursues profit, moving it in the desirable direction (Sanderson & Shaikh, 2020, p. 38).

It has also been proven sustainability concerns environmental, social and economic aspects. Hence the three "p's": Planet, People, Profit (UNEP, 2015, p. 28). The social ambition of sport is above all in the emotional aspect, for example *"Olympism seeks to create a way of life based on the joy of effort"* (see FP1) and *"the sports industry is primarily focused on selling an emotional experience"* (McCullough & Kellison, 2020, p. 7).

If the emotional service provided by sport were drastically reduced it would make any choice not shared and therefore lacking in support, thus losing the reason for the efforts.

In a similar way the economic aspect consists in the realization of financially possible initiatives, since profit is not a declared goal of sport, in particular the Olympic one, but the economic aspect is a constraint because only financially sustainable initiatives are achievable; according to Shearman (1990), economic growth and social justice require the achievement of environmental sustainability as a prerequisite without which they cannot be achieved. It follows that it is necessary not only to involve all functions of the sports organization, but above all to involve the recipients of the emotional product of sport (McCullough & Kellison, 2020, p. 6-7).
The conclusion of this first part of the reasoning is that it is necessary to keep alive the emotional aspect that binds people to sport; this would make it possible to send messages which, if appropriate and personalized, can induce a change in people’s behavior towards responsible choices for the environment.

If, despite local efforts, it is not possible to guarantee the achievement of the desired result, i.e., sustainability, it will be necessary to shift the burden from the solution to a higher level, as will be analyzed below.

Top role of the IOC

It has been shown that the involvement of a system with respect to sustainability requires an integral approach: in all systems the distinct functions are related to each other. The “environmental” function should therefore permeate the whole reality of the sports system. It is a question of resorting to people capable of highlighting all aspects related to the environment to determine how they can be changed in their respective activities at all levels.

Given the complex global system, the direct consequences of one’s daily action for environmental purposes are not directly measurable. Even the actions at the political level and the strategies of the states do not produce immediate effects on their territory, unless they refer to objectives of limited scope. For example, although a city can have direct positive effects by reducing private mobility and improving air quality, it remains difficult to achieve a direct effect on climate change because it depends on actions on a global scale. It is difficult to convince anyone to personally support efforts that have no

perceived effect on those who make that effort and which, moreover, can be made vain by the choices of others. Furthermore, the trend towards greening processes, which is the first step in this effort, is something other than making them sustainable, which is the goal. It should be added that until now the complexity of the sustainability problem has not allowed us to identify actions that are valid for every circumstance and therefore adequate solutions in other sectors may not necessarily be transferred directly to sport (McCullough & Kellison, 2020).

To keep a system alive, it is necessary to optimize and maintain a positive balance of the resources invested. Introducing in a production system the constraint of being sustainable for the environment can lead to its financial crisis because environmentally friendly solutions are not always the cheapest. If it is not possible to overcome this difficulty, having verified the usefulness of an activity that is not in itself sustainable for the environment, compliance with the requirement should be extended to a higher level, up to the global one. This is in accordance with what is indicated by the UN for the participation of states adhering to the sustainable development agenda: the different realities, capacities, levels of development and local priorities should be considered (United Nations, 2015, p. 7). The assessment of the need to support an activity that has an environmental impact changes over time and according to the culture of civilization that should remedy the damage. Therefore, it is a strategy of uncertain success. However, it may be the only option available to the top tier of an organization whose survival is otherwise at risk.

> *“Sustainability or environmental sustainability may be conceptually more appropriate on a larger, global stage, and thus one manifestation of that has been the Olympic Movement, more than other less global sports activities, incorporating that desideratum into its mission.”*
>
> (Sanderson & Shaikh, 2020, p. 38)

I can infer that if the IOC really wants to continue to carry out its mission it should require all levels of sports federations to do everything possible for environmental sustainability. For this reason, promoting awareness of the environmental issue is the first mission of the IOC, which necessarily requires the support of the recipients of the immaterial and exquisitely emotional product of sport. Furthermore, it will have to intervene on a global scale to eliminate any residual environmental impacts. The IOC

should do this because sustainability is a global dimension and has stated to promote it in sport (IOC, 2020, p. 17).

2.2 Areas of intervention for environmental protection in sport

The definition of sustainability applied to sport implies the possibility that sport can also be practiced in the future and therefore implies preserving places, equipment, resources and people. Every sustainable activity requires a purpose that can change but which should remain alive over time, not exhausted and not conflict with the purposes of other activities that are carried out. The diffusion of sport at all costs and its practice as a goal of a person’s life would not make sense while its sustainable development would strengthen the already demanding mission of the IOC: to guarantee every person the possibility of practicing sports to help bring out and train all the best human attitudes, in a context of balanced life (mind, will and body) and in a more equitable and responsible community. Therefore, the limit of the sustainability of sport should coincide with the enhancement of the characteristics of the human person, without degenerating into the ultimate goal of life.

In order to raise awareness on environmental issues, information should be given on the way in which the general and specific aspects of sporting practice have an environmental impact.

As established in the OC, the OM operates on various levels and with different purposes. The International Olympic Academy (IOA) and the National Olympic Academies (NOAs) are dedicated to Olympic education and therefore play a key role in developing an educational approach considering sustainability. The International Federations (IFs) and the National Federations (NFs) constitute the management of the sports organization of the Olympic disciplines and for this reason they can deal directly with the environmental cause, administering the economic resources and regulating the behaviors and procedures to be followed by all sports clubs. The Organizing Committee of the Olympic Games (OCOG) is responsible for organizing OGs in accordance with the OC and the IOC guidelines.

The following Table 1 summarizes some of the areas of intervention. [4] Three columns have been filled in referring to the three statements of the Olympic Charter regarding the IOC's commitment to the environment. The column "supporting responsible concern for environmental issues" evidently refers to the need to provide information on the corresponding item. The problem remains what and how to say it, which we will address in CHAPTER III, both for education in sustainability in educational institutions and in the study of sports disciplines, and with reference to practitioners and spectators.

All the activities (such as sports tourism, transport, production of facilities and equipment, clothing and training material, nutrients and supplements, personal care products, prizes, facilities maintenance and services, support of athletes, ceremonies, organization and management of events, product lines for fans) constitute a job opportunity for many people. The challenge of sustainability is to change the activities, production processes and their products, the type and delivery of services in a responsible way with the result of providing fair job opportunities and reconciling with the environmental protection.

[4] The order is alphabetical with respect to a keyword. Most cases of intervention are not necessarily related to the practice of Olympic sport or are not under the direct control of the IOC or the Ifs and NFs.

Table 1 – Areas of intervention for environmental protection in sport

Id	#[5]	Ch	Issue	Page	Supporting responsible concern for environmental issues	Promoting sustainable development in sport	Holding Environmentally responsible Olympic Games	Further recommendations
1	4	A.2.1	Air quality	120	Spectators should be informed about the importance of safeguarding air quality and the behaviors that best preserve it.	IFs and NFs should take care of facilitating the use of public services for the movement of spectators and reducing emissions from sport venues facilities.	The OCOG should deal with environmental monitoring and the elimination or reduction of polluting emissions before, during and after the games.	Implement a protocol to measure the polluting emissions associated with each event and establish reduction phases from year to year.
2	6	A.2.2	Animals and plants (non-human living beings)	121	Adequate messages intended for all athletes and spectators could make them aware that with their behavior they can give support to living beings in danger of extinction or subjected to unnecessary suffering.	IFs and NFs should promote the protection of animals, plants and their habitats through sports facilities and equipment that do not cause them unnecessary suffering and disturbance, as well as safeguarding the quality of water, air and soil.	The IOC and OCOG should take into account the impact on non-human living beings in the territory hosting the OGs. The use of animals in Olympic sports should always be carefully evaluated to investigate under what conditions this participation does not cause them pain	
3	1	A.2.3	Calendar of competitions from the grass level	122	Participation in competitions held close to home reduces the environmental impact	Minum number of major events	The four-year calendar should be further optimized with the help of IFs (?!?)	
4	1	A.2.4	Ceremonies	124	Recognize and communicate how ceremonies can have an environmental impact	Organize sober ceremonies that can be a moment to raise awareness on environmental issues	The opening and closing ceremonies are an opportunity to address environmental issues and provide an example of sustainability.	
5	2	A.2.5	Cities (sustainable cities)	124	We need to provide examples and encourage people to actively move and spend time in green spaces to meet other people and play sports.	IFs and NFs should promote the availability of open spaces for free sports practice.	OCOG takes into account the impact of the games on the host city through protocols shared with the IOC.	

[5] This column refers to the fields in the same column in Table 7 on page 158 and defines the relevant educational environment for each issue.

Id	#[5]	Ch	Issue	Page	Supporting responsible concern for environmental issues	Promoting sustainable development in sport	Holding Environmentally responsible Olympic Games	Further recommendations
6	7	A.2.6	Clothing (training clothing)	126	Information on the production system and the useful life cycle of products should always be provided	IFs and NFs should obtain reports from sports clubs and athletes on the use of renewable clothing and introduce limits on the amount that can be used in the sports season.	OG partners should be required to responsibly produce and reuse any material. All materials used in OGs should comply with environmental standards.	
7	7	A.2.7	Equipments (sport equipments)	127	See item A.2.6	See item A.2.6	See item A.2.6	
8		A.2.8	Facilities (sport facilities)	128	The use of environmentally friendly and functional facilities is an excellent example for all those who attend them, as athletes, technicians or spectators and guides them to responsible behavior.	IFs and NFs can encourage the green transition of sport facilities with specific regulations and certifications	The facilities that host the Olympic Games should be a shining example of functionality and sustainability and not turn into "white elephants".	
9	7	A.2.8	Gadgets	128	Producing useless items leads to an additional environmental impact that people should be made aware of.	IFs and NFs should encourage the use and reuse of celebratory products possibly that can also perform other useful functions, meeting the desire for participation of fans and respect for the environment.	All products authorized to display the symbols of the Olympics should also be respectful of environmental sustainability	
10	1	A.2.10	Gyms and fitness centers	130	Users should be informed about the environmental impact of the services they use and how they could act to eliminate or reduce it.	Management should provide services that respect environmental standards and inform practitioners about the benefits of reaching gyms with active mobility and using water, energy and all equipment responsibly.	N.A.	
11	2	A.2.11	Health services	131	Sportspeople should be made aware of the impact of their health care by promoting more responsible behavior towards its preservation and the environment.	IFs and NFs should continue to strive to reduce injuries and to counter the medicalization of athletes aimed at increasing the level of training.	Olympism's effort should be directed at reducing medical care to reserve it for other needs of human beings	

Id	#[5]	Ch	Issue	Page	Supporting responsible concern for environmental issues	Promoting sustainable development in sport	Holding Environmentally responsible Olympic Games	Further recommendations
12	2	A.2.12	Levels of Physical Activity and training volume	132	All those who practice physical activity should be aware of the importance of respecting the recommended physical activity levels to better manage the environmental impact of their training.	It seems utopian but the introduction of regulations to limit the hours and number of training sessions and competitions could be experimented by the IFs and NFs in order to preserve the same opportunities for athletes and safeguard the environment.	Up to now Olympism has never set limits to training except to guarantee the protection of young athletes.	
13	2	A.2.13	Media (sport media)	133	Sportspeople should receive useful information to choose and make the best use of media that meet the requirements of sustainability.	IF and NF should improve their communication skills to ensure that the media give moderate emphasis on the results of competitions and remain focused on disseminating the values of sport in a responsible manner also for the environment.	The use of media supported by innovative technologies can contribute to the effectivedissemination of the Olympic message and together with reducing activities with greater environmental impact, reaching billions of people directly in their homes.	
14	6	A.2.14	Nature (sport in nature)	134	Through fun sporting activities in nature, all age groups improve their awareness of environmental issues.	IFs and NFs engaged in sporting activities in nature should meet the stated requirements of preserving the sustainability and spontaneity of the natural experience and unrepeatability rather than standardization of competitions.	The introduction of sport into nature in the OG program facilitates the dissemination of awareness for environmental issues.	Pay attention to uncontaminated places and avoid using them for sporting activities.

Id	#[5]	Ch	Issue	Page	Supporting responsible concern for environmental issues	Promoting sustainable development in sport	Holding Environmentally responsible Olympic Games	Further recommendations
15	6	A.2.15	Nutrition (sport nutrition)	137	Specific awareness campaigns on the importance of sustainable nutrition should be carried out at all levels	IFs, NFs, sports clubs and athletes should refer to sustainable diets and avoid unnecessary use of products that do not meet this requirement and that can be replaced with others of lesser impact.	The nutrition in the Olympic village should always be attentive to sustainability and ensure that food is not wasted. All products authorized to display the symbols of the Olympics should also be respectful of environmental sustainability	Sports nutrition can be sustainable and should not constitute a pretext for the use of foods from specific production chains different from those of the healthy population.
16	6	A.2.16	Personal care	139	Information on correct environmentally friendly hygiene should integrate communications to athletes and fans	IFs and NFs should monitor consumption in sports facilities and facilitate the use of products and technological solutions with lower environmental impact.	The Olympic village should be built to reduce waste in the area of hygiene and care of people and partners with responsible supply chains should be selected.	
17	7	A.2.17	Prizes (medals, cups, trophies)	140	Athletes and all practitioners should be made aware of the symbolic value of medals and cups and that they should be sustainable.	The IFs, NFs and all those involved in organizing competitions should reward the winners with cups and medals made in a responsible and sustainable way, with low or no environmental impact materials and trophies to pass from hand to hand to the winners.	The Tokyo OCOGdecided to produce the medals by recovering heavy metals from electronic waste with the aim of allowing their reuse and having a positive environmental impact, preventing them from becoming pollutants. This or equivalent decisions should be made from now on	
18		A.2.18	Rules of the game	141	The practice of a sport that has rules that are also effective for the environment could in itself constitute a form of education in sustainability.	Compromises should be found to preserve the characteristics of a game and possibly introduce progressive changes that allow an ecological transition.	Rules on the number of participants, composition of teams, number of disciplines…can further influence the direction of the sustainability of the Olympic Games.	
19		A.2.19	SDGs (sport and SDGs)	141	See page 142			

Id	#[5]	Ch	Issue	Page	Supporting responsible concern for environmental issues	Promoting sustainable development in sport	Holding Environmentally responsible Olympic Games	Further recommendations
18	2	A.2.20	Spectators	146	Suitable communication campaigns should guide spectators to choices of responsible behavior regarding their movements, their presence in the competition venues and the consumption of resources.	The good example of IFs, NFs, sports clubs and athletes is needed together with investments in sustainable services for spectators.	Being spectators one of the main reasons for the environmental impact of mega events, the OCOG should carefully organize their transport, logistics, food supply, use of the media to achieve the declared sustainability standards.	Spectators make the atmosphere of a sporting event unique but due to their number they determine a great environmental impact that should be evaluated in all its aspects.
19	2	A.2.21	Tailgating (and other activities that take place at sporting events)	147	Socialization activities are important for participation in sport, therefore information campaigns should be particularly careful in suggesting the best behaviors aimed at avoiding an unwanted environmental impact.	The IFs and NFs should manage or have close collaboration with those who organize entertainment events.	The IOC and OCOG should interact with all efforts with local authorities and all stakeholders involved in exhibitions, sales and shows and socialization events during OGs to manage and reduce possible environmental impacts.	Tailgating should be controlled in terms of space to be used, noise emission, waste control and CO_2 emissions from vehicles.
20	5	A.2.22	Technology (in sport)	148	All athletes and fans should be made aware of the opportunities provided by technology and the risks associated with abuses for unnecessary use of resources even in sport.	IFs and NFs should evaluate the introduction of innovations in the regulations of the Olympic disciplines in order to remove obstacles to the affirmation of the human aspect of sport and facilitate the dissemination of the practice to the largest number of people in a sustainable way.	The IOC should encourage technology or refuse its indiscriminate introduction into sport but always with the same purpose: to stimulate the search for better and more attentive solutions to the environment, to the needs of athletes and the usability of sport for athletes and fans.	Technology can help find specific solutions but it shouldn't be a field of expanding consumption.

Id	#[5]	Ch	Issue	Page	Supporting responsible concern for environmental issues	Promoting sustainable development in sport	Holding Environmentally responsible Olympic Games	Further recommendations
21	6	A.2.23	Tourism (sport tourism)	149	The fact that a particular sport is practiced in an attractive environment should be accompanied by evidence that it is sustainable and does not cause harm also in relation to the number of practitioners. Those who travel and practice sports in holiday areas should have been informed of the possible environmental impact and the necessary measures to eliminate it.	IFs and NIs should demonstrate the commitment and effective capacity of sport in orienting the tourism phenomena related to its practice in a responsible way for the conservation of the nature of the places.	Sports that are a model for environmentally aggressive tourism should show their commitment to tackling this phenomenon in order to be included in the Olympic program.	The sense of belonging to the communities is a determining factor for the practice of tourist sports. For this reason, communities should carry out the task of informing practitioners, especially since environmental awareness is not associated with their responsible behavior (Wicker, 2017).
22	1	A.2.24	Tournaments (Globalization part I - international tournaments)	150	Athletes, teams, coaches, sports managers, referees and spectators should be informed on how to reach competition and training venues more responsibly and how their travel can compromise the sustainability of the sport.	The assessment of the environmental impact of an event depends on factors of scale that should be considered by the organizers at city, regional, national, up to international and world level.	It is necessary to identify cities that can best host OGs due to favorable environmental and climatic conditions and suitable and green infrastructures. The trips of all IOC and OCOG personnel involved in the organization of the OG and of the athletes, teams, media and spectators who participate in the games should be included in the environmental impact assessment.	
23	6	A.2.25	Training (environmentally sustainable training)	151	Sportspersons of all levels (even those who practice unorganized physical exercise) are often not aware of the environmental impact of their activity and give priority to their fitness and performance ambition. Information campaigns should focus in particular on how to limit use to non-renewable resources and contain the generation of waste.	The IFs and NFs could indicate requirements to be respected in training in order to reduce the use of non-renewable energies and produce less waste.	The IOC and OCOG should also make equipment available and facilitate training methods that can better meet the need to contain the use of non-renewable resources in the Olympic Village and Games Venue.	.

Id	#[5]	Ch	Issue	Page	Supporting responsible concern for environmental issues	Promoting sustainable development in sport	Holding Environmentally responsible Olympic Games	Further recommendations
24	6	A.2.26	Travel (for training, for participation in seminars, meetings at all levels of organization)	152	Environmental impact aspects should be considered and all participants should be aware of this issue.	All levels and events should be minimized by using forms of distance communication whenever possible.	See issue A.2.24.	Through the study, including in the local context and up to the Olympic Games with transport stakeholders it would help to find more effective solutions for participation in sport.
25	6	A.2.27	Travels of atlhetes (Globalization part II)	153	Although it is a difficult problem to manage and strictly linked to item A.2.24, athletes and teams should be aware that reducing their travel and traveling responsibly would have positive consequences for the environment.	See issue A.2.24	See issue A.2.24	
26	4	A.2.28	Water (use of water and water saving)	154	Suitable educational programs are needed to inform on how individual behaviors can better contribute to the protection of this indispensable asset even during sports practice or participation in sporting events as spectators and in all aspects of daily life.	FIs and NFs should at all levels comply with best technological and behavioral practices, including using specific game regulations, to control the consumption and purification of the water used, with objectives and programs defined over time.	The interventions to be implemented by OCOG extend across all the choices concerning infrastructure, health, sanitation, nutrition and hydration, materials and regulations of the OGs.	

2.3 Conclusion

The close relationship between sport and the environment requires the involvement of the entire OM and its active engagement in very different activities directly or indirectly linked to sport, athletes, technicians, spectators and all people. The recognized role within the international community assigns the IOC the responsibility of immediately maintaining the commitments declared in the OC.

CHAPTER III.

SUPPORTING RESPONSIBLE CONCERN FOR ENVIRONMENTAL ISSUES

As stated in the OC, education is one of the main missions of Olympism:

> "*Blending sport with culture and education, Olympism seeks to create a way of life based on the joy of effort, the educational value of good example, social responsibility and respect for universal fundamental ethical principles*" OC – FP1 - (IOC, 2020, p. 11)

> *"The goal of the Olympic Movement is to contribute to building a peaceful and better world by educating youth through sport practiced in accordance with Olympism and its values*" (p. 15)

In order to raise awareness on environmental issues, specific educational programs are needed for all people and the OM should address young people, athletes, technicians, managers, spectators, business partners, with a suitable language for each. Environmental education is a recent discipline and it is necessary to evaluate which tools can be best used in relation to the target audience. In the following paragraphs I will try to illustrate what the characteristics of sustainability education are, how it was taught, how it should be, and what the educational ambitions of the United Nations are. It will also illustrate where Olympic education is placed in the context of the education of the person and how it can provide a particular contribution through experience in nature and the proposal of dilemmas. There will also be an overview of the different audiences of the educational content.

I will conclude that environmental Olympism can only be successful through consistent education.

3.1 Sustainability education through Olympic education

In this chapter, the concept of sustainability education and the main challenges that need to be addressed will be defined: the lack of trained educators, the complexity and dilemmas inherent in environmental issues. The educational opportunity offered by the experience lived in contact with the natural environment will also be illustrated. Finally, the specific characteristics of Olympic education will be explored to conclude on how it can make its own contribution to sustainability education.

3.1.1 Define "education for sustainable development"

With Agenda 2030 (United Nations, 2015) 17 goals for sustainable development (SDGs) were declared. SDG.4 is about "*Ensuring inclusive and equitable education and promoting lifelong learning opportunities for all*".

SDG.4 contains 10 specific targets. SDG.4.7 is the one relevant to our purpose: "*By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development*" (United Nations General Assembly, 2015).

The *United Nations Educational, Scientific and Cultural Organization* (UNESCO) has proposed (UNESCO, 2020) to further distinguish Global Citizenship Education (GCED) and Education for Sustainable Development (ESD). In order to operationalize and evaluate the achievement of the objective, the following definition has been proposed:

"*Education for Sustainable Development empowers learners to take informed decisions and responsible actions for environmental integrity, economic viability and a just society, for present and future generations, while respecting cultural diversity. It is about lifelong learning and is an integral part of quality education*."

In order to better identify where the ESD is located within SDG.4.7, it is considered appropriate to attach the Table 7 – SDG Global Indicator 4.7.1, 4.7.4 and 4.7.5 - page 156 (UNESCO, 2020).

With reference to Sustainable Development Goal 4 – SDG.4, the scope and purpose of sustainability education are defined. The perimeter in which the OM should concentrate its efforts in the field of sustainability education is therefore also defined.

3.1.2 How to implement sustainability education programs

To educate young people about sustainability, it would be very helpful to have trained teachers. A look at the integration of sustainability education into higher education highlights the lack of consensus on educational approaches and allows us to identify two challenges: complexity and dilemmas.

Progress towards integrating sustainability issues into the curricula and management of higher education institutions around the world has been limited and efforts need to be supported by prior identification of effective teaching methods (Dlouhá, Glavič, & Barton, 2017), (Wilhelm, Förster, & Zimmermann, 2019), (Straková & Cimermanová, 2018). The affirmation of environmental sustainability requires the acceptance of environmental principles, the development of individual and institutional initiatives, the introduction in the teaching processes of transdisciplinary initiatives and innovation in contents and methods (Leal Filho, et al., 2019).

An attempt was made to identify the main competences to be strengthened in the higher education students (Dlouhá, Glavič, & Barton, 2017) (Rieckmann, 2012, p. 127; 132): "*competency in anticipatory thinking, in interdisciplinary work, in cosmopolitan perception and change of perspectives, in handling incomplete and complex information; participatory competency; competency in cooperation, in dealing with individual decision dilemmas, in self-motivation and motivating others, in reflection on individual and cultural models, in independent action, in ethical action; capacity for empathy and solidarity*" (Rieckmann, 2012, p. 132).

Since neither an education system nor a set of effective actions is available and certified (Dingle & Mallen, 2020, p. 82), those involved in sustainability education applied to sport will have to deliver this system while they are building it. The same generation that has not done everything possible for the environment and should teach young people how to do it should critically analyze the past to become an effective example.

3.1.3 Complexity

In the previous paragraph I stressed that education in sustainability requires the development of transdisciplinary skills, linked to complexity and the ability to deal with dilemmas. Now I will explain why a focus on complexity is needed.

The environment is a system whose balance is not an immediate consequence of the modifications of its individual constituents but depends on the way in which they interact. For this type of systems, defined as complex, it is necessary to have extensive and diversified knowledge in order to be able to predict the medium and long-term effects of any perturbation. I discuss below what difficulties the approach to complex problems encounters in the world of education.

Given the complexity of environmental issues, the attempt at simplification is a deficient approach. This concept has been summarized several times in an ironic way, for example by Bernard Shaw and more recently by David Grossman and by Sturmberg (2014): "*The most complex problems have simple, easy to understand and wrong solutions*". Complexity education requires at all levels that educators build a strong interdisciplinary interaction useful for the development of divergent and critical thinking.

The stand-alone approach is the most immediate and most used to provide solutions to limited problems. This approach involves monodisciplinary courses (which are part of a curriculum) in which a topic is addressed, including the case that it concerns topics that connect multiple disciplines. The multidisciplinary approach differs from it and is closer to the complexity of the phenomena, requiring greater students' skills and therefore their further commitment in already very crowded curricula. The choice of whether to introduce environmental sustainability as a separate course or integrate it into existing courses should consider the availability of teachers and their effectiveness in transmitting accurate and homogeneous knowledge capable of raising students' awareness on environmental issues. Otherwise, students may perceive the topic as a distraction from the knowledge they wish to acquire in each specific course (Dingle & Mallen, 2020, p. 83).

Finally, the approach to sustainability requires removing the boundaries between disciplines:

> *"In order to transform for the sustainability turn or transition, people everywhere will need to learn how to cross disciplinary boundaries, expand epistemological horizons, transgress stubborn research and education routines and hegemonic powers, and transcend mono-cultural practices in order to create new forms of human activity and new social systems that are more sustainable and socially just."*
>
> (Lotz-Sisitka, Wals, Kronlid, & McGarry, 2015, p. 74)

Therefore, complexity is a challenge that sustainability education should face, as it is a characteristic of the environment. For this reason, in order to formulate effective educational proposals in the theme of sustainability, Olympic education will have to deal with complexity. Complex problems, by their nature, do not allow easy-to-understand

solutions and involve introducing the other challenge of education in sustainability, namely dilemmas.

3.1.4 Dilemmas

We have seen how the interactions between the parts of a complex system are crucial for its balance. This requires limiting human actions to the threshold of the environment’s ability to restore itself in balance despite the perturbations. On the contrary, given the enormous expansion of humanity and the aspiration to use the environment for its own development, its activities have the potential to generate serious imbalances. To avoid these consequences, it is necessary to satisfy competing needs.

When we aim to meet different needs at the same time but have no win-win options, we are faced with what is called a “dilemma”. The dilemmas are frequent due to the lack of strategic decisions on the order of priority of the objectives and the erroneous assumption that it is possible to please everyone, while in reality different needs can conflict.

In the field of sustainability, dilemmas are the norm and not an exception (Juretzek, 2014): there is no known tool capable of simultaneously meeting social, economic and environmental objectives with the same result that could be achieved for each objective considered individually.

To contribute to sustainable development, each project requires choices with economic, social and environmental implications differently perceived in relation to the scale, from local to global, of the stakeholders. The adoption of criteria for distributing tasks and effects requires the definition of clear objectives, the enunciation of the interests and priorities of the stakeholders and assessment of the consequences on each one as a result of the implementation of the project. The local dimension could clash with broader interests and therefore balancing criteria should be adopted.

3.1.5 Sports that take place in a natural environment

Sport could help educate, in an informal way, people to take care of the environment as it is the place of competition. Some scholars question this capacity of both traditional sport and Outdoor and Adventure Sport (OAS) which are spreading rapidly. In both cases, sport is characterized as an activity aimed at developing the abilities of the practitioners and therefore their performances, for which the environment remains a standardized external factor (in the case of traditional sports) or variable (in OAS) of which the

practitioners should exploit the opportunities. The practice of sport in nature can pose a threat to environmental integrity, given the massive spread of sports specialties that take place in fragile places. The alternative to these outdoor sports could be experiences in nature for which motor skills become the tool for exploration and knowledge of the environment: climbing a tree to see its fruits or an insect; get to the top of a mountain to observe the conformation of plants and a river from above. Experiencing emotions linked to the discovery of nature and contact with it brings the identity of the practitioner closer and merges it with that of the environment in a perspective that changes from egocentric (or anthropocentric) to ecocentric. Compared to education and the transmission of theoretical notions, the perspective from the “inside” would be more suitable to transfer awareness on environmental issues as part of an emotional experience in which the person identifies his/her own self (Sharma-Brymer, Grey, & Brymer, 2020, p. 330-338).

Some studies therefore show that experience in the natural environment is particularly important and contributes to the development of interest and then of greater awareness when it is accompanied by adequate scientific information (Medeiros, Carvalho, Jéssica, & Penha, 2019).
According to Brymer et al., (2009) even extreme sports would be able to contribute to the connection with the natural world of practitioners and this would be an additional attraction compared to just aiming for strong emotions aroused by the associated risks.

The potential of outdoor education has been recognized since 1999 in New Zealand. Activities such as cycling, orienteering, camping and others can highlight the importance of the environment for well-being and therefore of preserving it. Such activities should be carried out in the immediate vicinity of schools while simultaneously meeting budgetary needs and the opportunity to have fun, develop individual and cooperative skills, environmental impact assessment, selection of risk management strategies and safety measures, promoting the sense of community and the values of traditional culture (Ministry of Education, 1999, p. 44-47).
The New Zealand physical education model aims to overcome the paradigm of individualism, scientific and technocratic contents of the sports regimes of the last century, to encourage students to experiment and learn through physical activity, with a critical approach on the effect of their actions, helping to select responsible behavior towards the environment (Culpan & McBain, 2012, p. 96-97) and thus making a contribution to Olympism.

3.1.6 Olympic education

In the previous chapter, the objectives of sustainability education and the challenges it faces were described. Sport, according to the Olympic Movement, is an educational tool (Binder, 2007, p. 22) (UNESCO, 2014, p. 30). In addition to this, the UN has also recognized sports facilities among educational institutions (Vallabh, 2018), (UNESCO, 2018, p. 180). Through the main documents dealing with Olympic education, its characteristics will be illustrated in order to verify its potential to contribute to sustainability education.

Naul (2008) in his analysis of Olympic education identified 4 educational approaches:

- The "knowledge-based approach", which consists in having historical, cultural and philosophical information, useful for getting closer to what Olympism was and is. This approach makes use of books, films, lessons, flyers, notes and consists of facts, places, dates, significant names in the history of Olympism.
- The "experience-oriented approach" which is characterized by participation in events such as games, shows, meetings, travels, competitions, celebrations and festivals in which the atmosphere of Olympism, friendship, cooperation, mutual understanding is experienced.
- The "Physical Achievement-Oriented approach" consisting in the learning process carried out striving for sport perfection which forms the basis for the development of social values to be acquired by confronting challenges with opponents.
- The "lifeworld-oriented approach" which implies that all educational activities, including those through sport, do not have a limited purpose in themselves, but should allow students to better cope with their lives. For example, in sport it is possible to experience an active and healthy lifestyle and then choose it over one based on inertia and inactivity.

According to Noul, "*without involving the "lifeworld oriented" approaches to Olympic education themes and issues, the remaining three didactic approaches will only have a limited scope*" (p. 123).

The Olympic Values Education Program (OVEP) is a sport-based program. It is taking place in two phases: phase I, which began in 2005, provided for the training of trainers; phase II, which began in 2010, has the ambition to involve thousands of young people around the world in the experience of *"Olympic values in action"* (IOC, 2016, p. 8). The program is based on the concept of *"learning through doing"* (p. 9) in 4 phases linked to

the knowledge of the fundamental principles and therefore to "*the history, stories and symbols of the Olympic games"* (p. 10).

3.1.7 Olympic education as sustainability education

In compliance with the educational approaches of Olympism indicated above, the development of awareness on environmental issues would require:

a. ecological information and on the effects of human use of energy resources and materials (knowledge-based approach);
b. experiences in both pristine and deteriorated natural environments (experience-oriented approach);
c. sporting activity in natural contexts (Physical Achievement-Oriented approach);
d. the guided discovery of responsible behavior (lifeworld oriented approach).

Examples of environmental education activities in the context of Olympic education consistent with the approaches a. and d. are contained in the OM Educational Toolkit (Binder, 2007) and in the latest OM Educational Program (IOC, 2016): discussing in groups about the meaning of words such as sustainability; reasoning on dilemmas such as choosing whether to preserve land for plants and animals or use it for human purposes; reflections on environmental issues such as waste management, water use and energy supply (p. 60). Readings are also proposed on the dilemmas arising from the practice of some sports that require highly technological systems and use of large environmental resources, project-based learning, magazines, blogs, creative thinking, problem solving; cities hosting OGs are discussed as role models (p. 74-75).

Despite the cultural and educational potential of sport, there are criticisms of what sport has done in the past, even many years after the IOC declaration of intent:

> *Within environmental studies and environmental sociology, sports as sites where economies and industries intersect with biophysical worlds are also often overlooked. The journals Society and Natural Resources, Environmental Politics, Political Ecology, Environment and Planning A and D, and Human Ecology Review published a handful of articles within the past two decades that directly addressed the socioecological imprints of sports, signaling little change from the mid-1970s mindset that classified sports within environmental sociology's low-ranking subfield of "recreation and leisure"* (Mincyte, Casper, & Cole, 2009, p. 105)

Considering that sport attributes function to the environment for its own purposes with the potential to generate detrimental impacts (Bunds & Casper, 2018, p. 4), that sport is associated with emotions and that these are also aroused by environmental stimuli, in order to direct the sportsperson towards an ecological approach, sport should increase the opportunities for experiences in nature (approaches b. and c.).

3.1.8 Conclusion

Chapter 3.1 has dealt with the definition of sustainability education. It involves strengthening learners’ ability to make informed and responsible decisions also for environmental integrity. While there is no consensus on how it should be taught, many scholars have argued for the need to cross the boundaries between disciplines in order to prepare learners for complex problems and dilemmas. The latter require the ability to prioritize and thus to make decisions and act consistently. Dilemmas are the norm, because win-win solutions are not always available, which means choosing when “conflicting” needs cannot be met together.

There is evidence that the experience in nature is an opportunity to develop environmental awareness and ecocentric perspective. Olympic education involves discussion activities, seeking solutions to problems, including environmental ones. This allows for the development of critical thinking and the ability to decide in dilemmas, consistent with formal educational approaches that have been recognized as part of sustainability education. Regarding the experience in the natural context with forms of free play and exploration to be carried out in spaces not modeled by humans, the Olympic education seems to lack any reference. The experience in the spontaneous spaces of nature should be disconnected from the competition being this last centered on the development of the self and on overcoming one’s limits in the challenges with the environment. On the contrary, to develop an environmental awareness it is necessary to undertake a relationship with nature capable of shifting the explorer’s perspective in an ecocentric direction.

3.2 Sustainability education in the OM

This chapter deals with environmental awareness promotion activities involving spectators, athletes and technicians. The results of educational activities carried out through sport in different parts of the world will also be illustrated. The scenario presents

some critical issues that should be addressed. For most of the activities, reference should be made to Table 1 (page 16) and the SDGs (page 142).

3.2.1 Spectators and recipients of sports information

Sport involves a considerable number of people around the world as practitioners, spectators or recipients of sports news disseminated by the media, advertising, friends and family (see chapter 2.1), even if they are not fans and are not interested in the sport.

> *"Sport has the audience and the necessary frameworks to communicate what needs to be done in a non-threatening manner, from a recognized and trusted source and in a common language of fairness and respect for others."* (McCullough & Kellison, 2020, p. xiii)

Olympism aims to always give a positive image of itself with the ambition to make the world better with a responsibility that extends beyond the sports public to all of humanity. Greening the image of sport based on an underlying and real commitment to sustainability is an example of responsible behavior towards the community, regardless of who is interested in sport. This falls under the topic of social responsibility which will be addressed in CHAPTER IV.

Spectators do not expect to receive scientific information or recommendations when they participate in a sporting event (Pfahl, 2020, p. 124) and for this reason they should be facilitated to adopt responsible behavior mainly by making sustainable services available to them (Trail & McCullough, 2019) (see Table 1, issues 1, 4, 5, 6, 7, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 24, 26). Changes in purchasing choices towards sustainable products also depend on how the respective qualities are communicated (Rossi & Rivetti, 2020). In fact, even if a growing number of consumers are concerned about the socio-environmental impact of products, there is a discrepancy between attitude and behavior. To fill this gap, sustainable consumption should be promoted with suitable communication campaigns involving influencers from the world of sport. Undifferentiated communication regardless of the level of competence on the issues conveyed does not ensure the best result for all recipients (Trail & McCullough, 2019). Information campaigns in events with large numbers of people who are at different points in their environmental awareness path are therefore less effective than messages delivered

in events where only one segment of people is prevalent (Trail & McCullough, 2020, p. 145).

The best communication campaign is to send each recipient the most appropriate message. It is about grouping the public according to awareness and responsible behavior for the environmental cause. This would require profiling with prior informed consent. This strategy can be implemented almost exclusively through social networks and the websites of sports clubs to which fans sign up, providing useful information to receive the communications of their greatest interest. The way forward is one of equal messages sent to all spectators during sporting events along with relevant examples of virtuous people, brands and products that enjoy the trust and esteem of the widest audience.

3.2.2 Athletes, technicians, volunteers and sports workers

Athletes, technicians and sports workers should know environmental issues both to act accordingly and to participate in the dissemination of environmental awareness as social role models and with planned communication initiatives. However, the ability of famous athletes to persuade other people remains a hot topic and depends on the credibility of celebrities on the part of the recipients of their messages (Reijmersdal, 2013), (Stentle, de Bruijn, Kerkhoffs, & Blewanus, 2015).

The environmental education of athletes can take place by their coaches and other educational figures in the context of participation in sporting events (as occurs for example during the Youth Olympics), meetings and refresher courses organized by the IFs, NFs up to locally. The education of athletes passes, in addition to the direct transmission of educational messages, through responsible choices by the technicians and sports clubs regarding training practices, personal care, travel to training and competition venues, equipment and clothing. Athletes can learn and implement sustainable behaviors on a daily basis both in sport and in social life (see Table 1 issues 3, 6, 7, 1, 12, 15, 16, 20, 23, 25, 26).

For technicians, managers, staff working in the field of sport and volunteers, education on environmental issues should be part of formal education. Volunteers can perform a useful function both by operating within sports clubs and by contributing to the support of the public and those who participate in sporting events by providing specific information and directing towards responsible behavior (Table 1, issues 15, 18, 19, 21, 24, 26).

3.2.3 Citizens

A 2019 study carried out by the University of Swinburne and related to the results achieved by sport in the Commonwealth in relation to the SDGs found that although SDG.4.7 is an extremely important sub-objective for the dissemination of environmental awareness with repercussions on human rights, a coherent sports policy “appears completely absent” (Sherry, Agius, Topple, & Clark, 2019). The same study made it possible to identify the areas of sustainable development indicated in the 2030 Agenda that are related to the traditional objectives of sport (SDG.3, SDG.4, SDG.5, SDG.8, SDG.9, SDG.10, SDG.11, SDG.12, SDG.13, SDG.16). The evaluation of these data suggests that sport policy continues to focus on its traditional objectives which, in a considerable number of cases, correspond to the SDGs of the 2030 Agenda. This highlights that sport has a lot in common with sustainable development and that it can play the key role that the UN has recognized. However, years after the IOC’s commitment to promote awareness for the environmental cause, the national sports policy strategies have not implemented specific programs corresponding to SDG.4.7.

In the 2020 annual report on the progress of the 2030 Agenda for Europe (Italia - Camera dei Deputati, 2020) it is explicitly indicated that in Europe there is slow or no progress in the specific of the SDG.4 (after an improvement in the period 2010-2018). In the analysis of the global situation, the same document indicates that “*although education is the key to socio-economic progress and poverty reduction globally, 617 million children and adolescents do not meet the minimum standards of literacy and mathematics and one in five children between the ages of 6 and 17 does not attend school. There are 750 million illiterate adults, two thirds of whom are women*” (Italia - Camera dei Deputati, 2020, p. Item 4). There is no mention of achieving the 10 sub-objectives of SDG.4.

In the UN 2020 Report, the UN Secretary General presented the document “Shared Responsibility, Global Solidarity: Responding to the Socio-Economic Impacts of COVID 19”. A worrying picture emerges in which the pandemic constitutes a threat to the main sustainable development goals as it can affect poverty, food security, education, health and determining generalized and mainly negative effects (SDG.1, SDG.2, SDG.3, SDG.4, SDG.8, SDG.11, SDG.13, SDG.16, SDG.17).

UN data show the problematic nature of education as a whole in many countries of the world where this situation overlaps with other serious problems. Everywhere sport could

make its contribution in a vast field of education. Not even where the situation is better, as in the Commonwealth countries, has any sports policy been developed for the dissemination of environmental awareness.

3.3 Conclusion

The picture that emerges is that the contribution of sport has been almost absent for education in environmental sustainability despite the statement reported in OC.

Therefore, although education is a foundation of Olympism, the possibility of achieving the goal of sustainability in sport actually depends on the action of the federations (down to the level of sports clubs) and the OGOG for organizing sustainable sport events. Meanwhile, Olympic education and dissemination of relevant information should continue consistently for the credibility of the entire OM.

CHAPTER IV.

PROMOTING SUSTAINABLE DEVELOPMENT IN SPORT

In the previous CHAPTER I the theme of raising awareness on environmental issues and Olympic education was addressed. I concluded that although education is very important and capable of pushing the Olympic movement to adopt practical solutions to environmental problems, the implementation of coherent choices is a decisive factor in safeguarding the environment.

> "*In other words, in order to push sport organizations toward the adoption of large-scale environmental initiatives (as opposed to typical "fan awareness" campaigns and green sponsorships), advocates must pressure sports institutions and governments to enact laws that require an appropriately high level of environmental management for sports facilities and event operations*" (Kellison & McCullough, 2020b, p. 451).

A further conclusion was the recognition of the role of experience in nature for environmental education purposes.

Therefore, from now on I deal with the second of the commitments declared by the IOC regarding the environment that is "*to promote sustainable development in sport"* (IOC, 2020, p. 17). The sentence of the Olympic Charter may present doubts of interpretation on the extent of this ambition, as it declares the promotion of sustainable development **in** sport and not **through** sport. I will strive to give meaning to this commitment inside and outside sport by addressing the issues of social responsibility, marketing, environmental certification, the local perspective of environmental actions and the rules of the game.

Finally, to satisfy the educational need for experiences in nature, I will mention the opportunities that should be provided in the field of sport.

4.1 Sport development under the environmental banner

Supporting environmental causes is controversial and probably less straightforward than other initiatives. There is no risk of losing an audience in applying to contribute to cancer research, defeat hunger or poverty while committing to the environment involves behavioral changes and making decisions that affect, for example, participation in competitions and the sale of consumable products that have an impact that extends on large sectors of society (Sanderson & Shaikh, 2020, p. 39-40). Sporting events organized

by federations take place, for example, in privately built facilities suited to the business model of their owners. These, in the absence of binding regulations, could choose to continue to build sports facilities with maximum comfort and with cutting-edge technological solutions, rather than having fewer performing structures or less appreciated by the public in the name of respecting self-imposed constraints for achieving of environmental objectives. If the activities that are sustainable do not achieve superior performance and there are no legal restrictions, there will remain considerable resistance to becoming spokespersons for a change that requires radical immediate actions of all one’s behaviors.

People who have better economic stability and an average higher cultural level are more aware of environmental issues:

> *“…the population segments most concerned about the environment and complementary social agendas have disproportionately high incomes and are better educated.”*
>
> (Sanderson & Shaikh, 2020, p. 41)

Sports and teams that involve these people as practitioners and spectators are facilitated in supporting environmental initiatives; at the same time, they should act accordingly, otherwise supporters will leverage their loyalty by subordinating it to desirable and expected behavior.

When we refer to sustainable development and associate the word “sustainable” with a system, for example “sustainable agriculture” or “sustainable sport”, we risk falling in love with a concept rather than making sure the system we have in mind is possible. Meeting the sustainability requirement can ensure the continuation of the system we are dealing with in terms of greater effectiveness, the adoption of another that is adequate for revised objectives or in the worst case, decommissioning the system.

Finally, sustainability does not concern an isolated or specific system, but systems that relate to each other and that are instrumental to their purposes, with biological, social and economic dynamics and different priority criteria. Pursuing sustainability is like pursuing excellence: it involves working hard on balance, making the best use of options, optimizing vs maximizing, choosing what to take or leave according to priority criteria.

The Table 1 on page 16 is an aid, together with the insights in chapter A.2, to keep in mind (through the dedicated column) the individual issues to be addressed for the promotion of the sustainable development of sport. They are the responsibility of the intermediate level of the sports organization. Further topics will be analyzed below, which are also the responsibility of IFs and NFs but with strategic value. We might expect that where federations do not act autonomously with sustainability in mind, for example by failing to organize their events in facilities and in ways that meet environmental requirements, the IOC should explicitly intervene with its own recommendations.
Furthermore, reconciling modernization and the use of practices that are less impactful for the environment as they can mitigate undesirable effects, should not be used as a justification for continuing or even increasing them for one's own purposes:

> "*Similar to the sporting industry, the extractives industry and its proponents (which include governments) have adopted an ecological modernist approach to environmental issue. The ecological modernization approach proliferates a discourse that allows for the continual expansion of resource extraction by focusing on technological advances to combat the negative impacts on the environment* (Davidson & MacKendrick, 2004). *With this lens, environmental reform is viewed as* "*an additional way to make more profit in the long run*."
>
> (van Luijk, Giles, & Hayhurst, 2020, p. 53).

4.2 Sports marketing and environment

To pursue the stated goal of the harmonious development of humanity (FP1) it is necessary that people are reached and connected through effective marketing policies of the entire Olympic Movement.

Marketing has been defined as "*the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large*" (AMA, 2017).

It was illustrated that for the definition of sustainability it implies at the same time the satisfaction of results that pertain to the social, economic and environmental spheres. Preaching and pursuing environmental sustainability out of context may prove ineffective. Purchasing and behavioral choices are linked to economic and social aspects and have environmental effects. For this reason, the possibility of orienting people involved in the world of sport towards the environmental cause in their behaviors as

consumers requires knowledge of the marketing strategies that guide purchasing decisions.

Some options that can shift fans / spectators towards responsible choices and simultaneously improve sustainability in sport will be illustrated below.

The way in which sports clubs, which can also be Publicly Traded and represent important economic realities, carry out their marketing could provide food for thought to sports federations, which have in common the ambition to retain people.

The economic benefits of environmental choices by sports clubs and federations derive not only from the reduction of costs for better efficiency, but mainly from the possibility of accessing forms of sponsorship and marketing related to the environmental cause (Feldman, Soyka, & Ameer, 1997), (Feldman, Soyka, & Ameer, 1997). In order to maximize this opportunity, information campaigns are needed that are capable of being educational and of privileging news regarding activities with real impact and capable of guiding consumers towards more effective decisions (Polonsky & Rosenberger, 2001).

Increased public attention to the environment has encouraged organizations to develop relationships with specific causes (Mallen, Adams, Stevens, & Thompson, 2010) and the emergence of cause-related sports marketing (Adkins, 1999). This is intended to luster the brand, to increase the bond of the consumers and to attract them to a new brand (Lachowetz & Gladden, 2003). For this process to work it is necessary that the consumer perceives a deep commitment from the company (Kim, Kwak, & Kim, 2010) and that there is a willingness to trust, the factor of greater social effectiveness (Rotter, 1967).

The integration of awareness of environmental causes with purchasing choices guides consumers, even with higher costs, to responsible purchasing (Mendleson & Polonsky).

These strategies are most successful when consumers are convinced that the real motivation is to support the cause and not use it as a pretext to generate business (Barone, Miyazaki, & Taylor, 2000). Altruistic motivations reinforced by the acknowledgment of the beneficiary are effective.

Approaches such as greenwashing or light green, of those who try to give themselves an ecological aspect for the sole purpose of reducing criticism and addressing environmental problems only superficially are among the blameworthy behaviors. In the long run they

can compromise the credibility of those who adopt them as contradictions of behaviors emerge that are not founded on solid environmental bases. Some critics have found greenwashing phenomena in professional leagues such as the National Hockey League (NHL) (Johnson & Ali, 2020).

All federations and the Olympic movement should stay away from these behaviors and avoid using the environment as an excuse to conduct competitions. Cases of this type according to the critics may have involved the organization of the Albertville 1992 Winter Games (p. 322) and of the construction of the golf course in Rio de Janeiro for the OGs 2016 criticized by the mayor of Rio Eduardo Paes himself at the inauguration (Vercillo, 2016, p. 251). Another example is the 4 temporary facilities built for the Atlanta games and then demolished with the result of producing non-recyclable waste: their sustainability, which was based ex ante on their temporary nature, was a failure (Scandizzo & Pierleoni, 2017, p. 11). Therefore, it remains urgent to have an accurate environmental impact assessment, rather than promising environmental sustainability with the risk of not being able to ensure it in order to go on to organize competitions (see also CHAPTER V, which deals with the sustainability of OGs).

One approach is suggested by the congruence theory which is based on a correspondence between recipients, event and sponsors in relation to the human personality traits to which products and services can also be assigned (Lee & Cho, 2009): sincerity, enthusiasm, competence, refinement, robustness. Therefore, associating these qualities with an initiative and with examples of accepted models, can guide fan to corresponding choices.

Another approach is given by the strong identification of a supporter with the supported organization, which orients him/her to the connected product / service / behavior [theory of identity (Lee & Ferreira, 2011)]. In the case of federations, associating their image with a virtuous environmental initiative will allow their supporters to know it better, to share it and to support it for the sense of identity.

The strategies that federations should use to improve sustainability in sport are the organization of sustainable events in sustainable sports facilities, the use of environmentally responsible products, the choice of partners who are responsible and committed to the environmental cause, support clear and direct for the environment, for example with local initiatives for the protection of the territory. These solutions would

also be better able to guide the consumption choices of fans / spectators and improve their confidence and stimulate their responsible participation.

In conclusion, linking sporting events to environmental causes can perform some environmental functions. In fact, it can contribute to the orientation of fans / spectators towards responsible consumption choices. It also acts as a lever for federations to act consistently in organizing events and in relations with partners with respect to what they have declared. Finally, it acts positively in maintaining an authentic bond of trust with fans / spectators based on shared environmental purposes.

4.3 Certification

Problems like the sustainable organization of the Olympic Games need to be addressed to also organize local events wherever sports are played. The possibility that they are local and therefore simpler should constitute an opportunity to subsequently face the same problems that arise in a more complex form in mega sporting events. By addressing the sports-related issues they deal with around the world, federations could assure their best contribution to the IOC: they are required to collaborate in reviewing the candidacy process of cities to host the games (IOC, 2020, p. 56 - 1.4) and to take responsibility for the control and direction of their sport at the Olympic Games (p. 56 - 1.5).

Sports facilities can have a direct environmental impact that should be measured. The way they are constructed and used should fall within the responsibility of the federations which have the duty, *in conformity with the Olympic Charter* (p. 55) to “*ensure the development of their sports around the world”* (p. 56- 1.2)

This is why this section addresses the issue of sports facilities whose impact should be mitigated consistently with the Olympic Movement’s commitment to the environment.

The International Organization for Standardization (ISO) has developed two protocols relating to sustainability:

- ISO 14001 supports environmental performance by establishing standards for an effective environmental management system (ISO, n.a. a);
- ISO 20121 establishes a framework for sustainable event management in a structured way and was first used in the London 2012 Olympic Games (ISO, 2015).

There are also protocols made by national certification bodies, such as that of the U.S. Green Building Council (USGBC) and the Leadership in Energy and Environmental Design (LEED).

The protocols mentioned were created for buildings with residential use, offices, schools, commercial offices. Their use for sports infrastructures requires considering differences such as the intensity of use of the facilities that for a stadium consists of hosting from one to three matches in a week while a shopping or residential center is constantly open.

The certification (and sustainability studies) in the context of buildings and sporting events are mainly concerned with the management of a “built space”, different from the natural one, which should be suitable to meet a specific need and be in a positive relationship with the surrounding environment.

Defining the objectives from the initial moment of the construction of a building or the organization of an event, makes everything easier and involves cost containment (Lambert, 2013).

Contacting a certifying body makes it possible to adopt criteria already used previously, to have and help collect a database that facilitates the progress of the results towards sustainability. Measurements are the scientific tool that allows to verify the critical issues, the current level and the prospects for aiming for better environmental performance.

Certification institutes cannot provide definitive answers on indirect economic benefits, in terms of image and involvement of stakeholders and the environmental impact of certification itself. Given the voluntary nature, adherence to these programs will take place only if those who have the responsibility for the choice consider them as the best available option for achieving the objectives of sustainability, efficiency, image and return on investment (Nguyen, 2020) and if the facilities will be used consistently with the feasibility study.

The certification systems evaluate the use of building materials (if they come, for example, from previous demolitions or from virtuous chains), the energy balance of the structures, the energy sources (wind, solar, geothermal and other renewable energies, efficiency of thermal systems, harmful emissions into the atmosphere), the water resources used, the management of wastewater, the recovery of rainwater and the conservation of aquifers, the monitoring of the atmosphere and water, the means of

transport for spectators, waste management, light and noise pollution. For the health, comfort and efficiency of the spaces dedicated to athletes and the public (dressing rooms, bedrooms, health services, restaurants, shops, meeting points) environmental monitoring extended to the supply chains (food, laundry, items sold) is required. For each aspect, appropriate indicators are established that allow to define the objectives and guide the process in a conscious way, making sustainability visible and protagonist in the decision-making process and in the conduct of sporting events.

In the United States (USA gov, 1969) and Europe (EEC, 1985) there are regulations concerning the environmental requirements of buildings. The orientation in the field of sports facilities and events is to require submitting environmental impact reports for approval by the government.

This area is a sensitive area of discussion between governments and NOCs. The intersections with health, public order, energy, education, food, economy, media, transport, infrastructure, waste, consumption would make a privileged position of sport unjustified compared to other areas for which the same decision-making autonomy is not granted. The autonomy requested by the IOC is aimed at avoiding sport being an extension of politics for different purposes. The UN recommendation states "*The General Assembly.... supports the independence and autonomy of sport, as well as the mission on the International Olympic Committee in the leadership of the Olympic movement*" (United Nations General Assembly, 2014). The boundary stems from the distinction between Olympic sport and any other sporting activity that governments may consider promoting and managing directly, as is legitimate in other fields such as education or healthcare. While a NOC cannot be modified, organized or controlled by law without interfering with Olympic goals, this does not mean that the national government should unconditionally allocate resources to it and give up the possibility of playing sports in order to protect citizens' interests, manage the resources of the State and take action to optimize the results of their use on the territory and on the communities, without Olympic purposes. For this reason, the Olympic Charter itself indicates that "*in order to fulfill their mission, the NOCs may cooperate with governmental bodies, with which they shall achieve harmonious relations*" (IOC, 2020, p. 60).

Although the European community cannot actually act on the activities of the Member States, the views of the committees can serve as recommendations. The European community recognizes the importance of sport but the 2007 White Paper states:

> "*The practice of sport, sport facilities and sport events all have a significant impact on the environment. It is important to promote environmentally sound management, fit to address inter alia green procurement, greenhouse gas emissions, energy efficiency, waste disposal and the treatment of soil and water. European sport organizations and sport event organizers should adopt environmental objectives in order to make their activities environmentally sustainable. By improving their credibility on environmental matters, responsible organizations could expect specific benefits while bidding to host sport events as well as economic benefits related to a more rationalized use of natural resource*s" (Commission of the European Communities, 2007).

Under the pressure of the federal government in the USA and the community government in Europe, the governments of individual countries, if they have not already promulgated more protective environmental laws (for example the state of California), can find an incentive to intervene more with the force of law so that the activities related to the sport always have environmental sustainability and compliance with standardized parameters as a requirement.

Following the positive assessment of the environmental impact of the stadiums and plants over their life cycle, the laws may allow access to incentives and the economic participation of public administrators. A particularly interesting model that highlights how the exasperation of technological innovation also hides pitfalls, is provided by the steady state economy. This theory is well discussed by McLeod and Holden and is presented below (2020, pp. 429-442). It provides that the environmental impact assessment of an infrastructure project should use as a discriminating parameter the forecast in the design phase of the time in which it will have to be replaced with a new structure, indicated as the date of ecological maturity. This date should be as close as possible. In fact, the duration over time of an infrastructure should not necessarily be considered positively, nor should it be used for the purpose of optimizing management profits or for receiving public incentives. A reduced ecological maturity date corresponds to being able to replace an existing structure with a new, more performing structure after

a shorter operating time, having reached the balance of the environmental impact as soon as possible. This means that rather than investing large environmental resources and waiting for an exceptionally long operating time of the facility to mitigate the environmental effects or to extend its life by investing additional resources for its adaptation, it is desirable to reduce the initial investment of environmental and economic resources. After a brief time, at the end of the date of ecological maturity, it will be desirable to take over a new facility capable of maintaining the steady state. This means ensuring that all investments in environmental resources are always minimal, allowing subsequent technological developments to use minimal environmental resources in the future without anticipating their use. Conversely, advanced technological innovation that seeks to look far ahead in time could invest environmental resources over an extended period, reducing the benefits of implementing subsequent technologies. Further damage could arise even if the technologies are implemented in advance of the ecological maturity date with environmental resources already invested and not yet returned by the operation of the facilities.

Food for thought is also provided by the Registration Convention adopted by the United Nations General Assembly in 1974 and entered into force in 1976, which deals with objects thrown into outer space (General Assembly UN, 1974). The legal consequences of its application (RGA, 2018) are the punishment of those who produce space waste. These can in fact compromise the future safe use of space and cause damage resulting from uncontrolled falls on the earth's surface. The period that is agreed as correct for causing orbiting objects to fall in a controlled manner is estimated at 25 years. This approach means making an estimate of the entire life of the object and also predicting its destruction over a period of time that corresponds to that traditionally associated with a human generation. It can be also useful for further understanding the concept of legacy (see also 5.7 page 72) and to ask whether it is legitimate to strive to pass on to future generations something that over time could prove not only useless but also potentially harmful despite good intentions and every effort to forecast future needs.

In summary, I stressed that federations should also deal with the impact of sports facilities and events which should be subject to specific laws in each country. It is also desirable, on a voluntary basis, to use more restrictive environmental certification criteria. Some aspects have been introduced (for example energy and water consumption) which are indicators of the environmental impact, including the so-called date of ecological maturity

of a building. Reports from government agencies, as in the case of the EEC, indicate that much remains to be done and that the impact of sports facilities on the environment remains high and requires a more rational use of resources.

4.4 Act locally

One of the slogans of sustainability, “think globally and act locally”, appears in many articles and on the UNDP website and in Olympic Movement’s Agenda 21 (IOC, 1999, p. 14). It refers to the ability to build ambitious goals while remaining on what we can do where we are: each action as part of a larger project and therefore to be valued even when it appears modest.

> *“No initiative, however small, should be neglected. Indeed, we should “Think globally, act locally”*
>
> (IOC, 1999, p. 14).

But above all, an action can directly solve a problem of the local community. Recalling once again that the practice of sport should be integrated into the social context and that sustainability has three dimensions (social, economic and environmental), those involved in sport should consider educational services, businesses, public administration, environmental resources and the people who are nearby.

Collaboration with the local community and its stakeholders is an opportunity for the construction and sustainable management of sports facilities. Construction materials can be of local origin or of local reuse. The foods sold in sports facilities can come from a short and responsible supply chain in harmony with the local culture; as I wrote above, leftover food can be used for the local community through the support of organizations that help those in need. The collaboration with universities and institutions that deal with study and research, in addition to involving young people who live nearby, facilitates the development of innovative solutions in harmony with the local context. The use of renewable energy sources, the collection of rainwater to be stored for the irrigation of green spaces and the play field, the strategies to manage or reduce the production of waste or its use to produce compost and biogas, are activities which can be better carried out thanks to the collaboration of specialized companies. The involvement of the transport company can reduce the environmental impact that fans and practitioners generate by going to the sports facility.

In summary, authentic collaborative relationships with local stakeholders in the energy, waste, research, food, agriculture, transport and social services sectors are extremely useful for accessing the skills and tools suitable for aspiring sustainability and are an opportunity to combine environmental protection with the other needs of the community.

4.5 Rule of the games

The rules of the game can lead to undesirable environmental impacts of sport and the federations bear responsibility for this. Infact the tasks of the federations include:

> *“to establish and enforce, in accordance with the Olympic spirit, the rules concerning the practice of their respective sports and to ensure their application”*
>
> (IOC, 2020, p. 56 - 1.1)

Furthermore, the IOC indicates precise responsibilities for the management of the rules with the aim of respecting the environment:

> *“The environmental consequences of changes in sport rules should be taken into consideration when any such changes are being contemplated*.”
>
> (IOC, 1999, p. 34)

Given the number of disciplines and competitions, a specific assessment is required, case by case. The rules may concern organizational aspects of competitions and tournaments, the number of participants, the venues of the competitions, the equipment, the characteristics of the playing field, the number of people aiding the athletes. An example that I believe is significant for the environmental impact it entails is the choice of the grass for a golf course about which a lot has been written (Salgot & Tapias, 2006): the type of grass, the possibility that it is native and the finish of the playing surface to be obtained have significant effects on the consumption of resources, with the amount of water needed for irrigation and the use of pesticides.

The rules can properly act on sustainability **in** sport. But they can also have indirect effects. For example, a race that is held in a place that is difficult to reach has an environmental impact that occurs because the race is organized.

4.6 Increase the opportunities to practice sports in a natural environment

Given the importance of sport in nature, it would be useful to increase the opportunities in each specific sport by making natural spaces available close to existing sports facilities and collaborating with local authorities. Collaborative relationships with local authorities, as already indicated, should be aimed at achieving the objectives of Olympism and therefore good communication should also be used to leverage the social structure in order to intervene on issues that are not strictly within the competence of the sports field. This would allow, for example, to contribute to optimizing the management of public spaces for their appropriate use also for sporting practice, both organized and autonomous. The better overall organization of city spaces should have the aim of having places for practice close to home, reducing the environmental impact of passive travel and increasing the possibility of active mobility by bicycle and on foot. Furthermore, it could act as a brake on the spread of sports which, despite being carried out in nature, are practiced in places whose ecological balance can be compromised and which are distant from the places where one lives, with further impact caused by travel to reach them. Sports practice in natural contexts should have a compromise between the purpose for which it takes place and the safeguarding of nature itself that could be found in spaces very close to urban ones and therefore only moderately anthropized, rather than in totally wild spaces. Each federation should propose activities that integrate the specific discipline with experiences in nature, at the grass level and for all age groups.

Some in-depth information on these aspects are available in Table 1 page 16 and in the corresponding issues in the appendix (A.2.5 and A.2.14).

4.7 Conclusion

Pursuing sustainability in sport coincides with the very possibility of practicing sport and using it to realize the ambitions of Olympism. It is not a question of assigning other tasks to sport and asking the OM to become something else, but of taking note, in sport, of human's primary needs linked to the environment. Sports that pretend to be involved in something else or go green by waving the flag of environmentalism are cheaters and become a hoax, damaging their image and credibility. The federations and the Olympic movement should keep away from this attitude by carefully and scientifically supporting their commitment to the environment.

The assumption of environmental protection and sustainable development should be structural within the sports movement and have concrete actions and indicators to evaluate the effects of these actions on the environment. The strategic positioning within the Olympic ideal of sustainability and the perspective of the steady state, which involves not anticipating the use of environmental resources if not strictly necessary, should characterize the way in which commitment to the environment can be implemented locally and at federations’ level. For this reason, the federations should pursue the sustainability of the facilities in which training and competitions take place and the events they organize.

In order to satisfy the different needs in a balanced way, the connection with the local social fabric should also be strengthened to adopt shared solutions with educational institutions, research, local companies dealing with water, energy and waste, organizations that take care of disadvantaged people, the local production of food and products useful for sportspersons.

To meet the educational demand for experience in the environment, they should also seek to increase the natural spaces for the practice of their sport and see how this can best ensure the experience in nature. They should also be concerned with verifying how the rules of the game determine an environmental impact and how they should be modified to limit it.

The issue of sustainability of events and facilities will be addressed further in the next chapter.

CHAPTER V.

HOLDING ENVIRONMENTALLY RESPONSIBLE OLYMPIC GAMES

It is extremely difficult to conceive of Olympism without the Olympics and the Olympics without Olympism, even if some have critically theorized their mutual independence (see 5.6 page 69). In any case, the Olympic movement has declared among its missions "(to) *ensure the uniqueness and the regular celebration of the Olympic Games*" (IOC, 2017a, p. 16) and therefore not playing them would require either a change of mission or the failure of the OM.

Precisely because the Olympics are the most impactful global test of Olympism, the construction of the image of Olympism and the confirmation of its ability to implement the commitments declared in a festival that celebrates humanity should focus on it. Given the enormous organizational size and the potential impact of OGs on the environment and community of the host city, they represent a significant challenge for Olympism. Their size and scope have the potential to undermine the foundations of the principles of sobriety, precaution and steady state which aim to cancel the anthropic impact on the planet (environmental perspective) and should bend exclusively to satisfy the essential needs of social and economic spheres (sustainable development perspective). Better than the others, as the Olympic Games are the supreme task of OCOG and IOC, they express OM's strategic objective.

In this chapter some sustainability indicators and the guidelines with which the IOC has been tackling the challenge of sustainability for years and the mission of leaving a positive legacy to the city that hosts the OGs will be addressed. The main criticisms of their staging will also be reported. To verify whether scientific knowledge, the results of the scholars who deal with the Olympics and the criticisms of the opponents have been valued, the recent strategic documents for the sustainability and legacy of OGs will be presented. This is to seize the effective possibility of achieving the declared objectives and meeting the expectations of the United Nations 2030 Agenda.

5.1 A regulatory approach

To verify that OGs comply with sustainability criteria, declarations of intent are no longer enough. In the world of entrepreneurship, manufacturing and agricultural production, voluntary protocols have been introduced for the certification of specific requirements.

The voluntary nature of adhesions has been replaced or supported in some areas by mandatory rules introduced by the bodies that have authority in specific sectors. The path of sport sustainability reproduces this consolidated experience in other areas. This is called the “regulatory approach”.

The commitment to the environment and the positive legacy of the games for the city and the host population are two closely related objectives indicated in the Olympic Charter.

The following statement, absent from the 2001 OC, was first introduced in 2003:

> *“For that purpose the IOC:*
>
> *…takes measures to promote a positive legacy from the Olympic Games to the host city and the host country, including a reasonable control of the size and cost of the Olympic Games, and encourages the Organizing Committees of the Olympic Games (OCOGs), public authorities in the host country and the persons or organizations belonging to the Olympic Movement to act accordingly”* (IOC, 2003, p. 12).

Since 2004 the statement has become the following and has never changed:

> *“The IOC’s role is:*
>
> *15. to promote a positive legacy from the Olympic Games to the host cities, regions and countries”* (IOC, 2020, p. 17).

Furthermore:

> *“In the determination of the location, sites and venues of the Olympic Games, priority must be given to the use of existing or temporary venues and infrastructures. The construction of new permanent venues or infrastructure for the purposes of the organization of the Olympic Games shall only be considered on the basis of sustainable legacy plans”* (p. 72).

Finally, the Olympic Charter establishes that any surplus linked to the organization of the Olympic Games should be within the availability of the OM with the consultation of the host city and country (p. 69).

To lead change, every organization needs to involve all its members and declare its objectives in a formal way through documents capable of summarizing the so-called

strategic concept. Given the priority of the sources with the OC at the top, it follows the imperative to develop specific themes in dedicated documents. To realize these ambitions, the IOC implements its own standards, such as contractual documents with the OCOG. It has also decided to voluntarily submit to existing standards or collaborate for their definition, with adaptations to the needs of OGs, as did the LOCOG 2012 that used ISO 20121 (see chapter 4.3, page 44).

It is an acceptance of responsibility that is managed within a set of rules that from voluntary become progressively binding. These voluntary norms help to define the expected behavior patterns in an enlarged context, in which institutions and organizations establish mutual relationships based on respect for voluntary norms. Voluntary submission to these rules allows an image advantage but also the possibility of realizing a real transformation (Porter & Kramer, 2018).

The connection between the two purposes of the IOC (sustainability and positive legacy of the games) has led to the possibility that a reality that can be defined as local, constituted by the Organizing Committee of the Olympc Games (OCOG) of the host city, has had to define local procedures with global effects since OGs are mega events. This has stimulated the efforts of the OCOGs to develop specific projects and organizational standards with the potential of setting up reference models, so much so that in 2007 the IOC received the recognition of Earth Champions from UNEP (IOC, 2007b).

In the area of sustainability, the first significant document is *Agenda 21 of the Olympic Movement* (IOC, 1999) while the current strategic path of the entire OM is collected in the 20 + 20 recommendations that make up the Agenda 2020 (IOC, 2014b) and in the document IOC Sustainability Strategy (IOC, 2017b).

The promotion and updating of *Agenda 21 of the Olympic Movement* is entrusted to the Sport and Environment Commission of the IOC which has the task of working closely with the United Nations Environment Program (UNEP) and to present the results in position papers and world conferences.

The document that deals more specifically with the impact of games is the protocol defined as Olympic Games Impact (OGI) (IOC, 2007a, p. 11).

Another aspect that will have to be evaluated, together with the sustainability of the OGs, is the actual legacy for the host city which, as required by the OC (IOC, 2020, p. 17) should be positive. For this reason, the two documents cited relating to sustainability will be treated in the next paragraphs and the concept of legacy will then be introduced. I will show the two aspects are closely linked as they contribute to the possibility that cities apply to host the Games.

The picture will be completed in the following chapter 5.4 which will illustrate the achievements in the previous editions of the Games (including those prior to the use of the aforementioned voluntary standards), the risks of the future organization of the games and criticisms from opponents.

5.2 Olympic Movement’s Agenda 21 - Sport for sustainable development

In this chapter, as presented in the official document, the numerous topics that the IOC claims to address in order to use sport for sustainable development will be indicated. The picture that emerges highlights a declaration of intent that covers all sectors of sport and relations with environmental resources and with social, health and economic needs.

> *“Environment like sports knows no frontiers, no territorial borders. It transcends ideological cleavages. It does not recognize artificial distinctions between North and South or East and West. It is one and indivisible. We are all members of the global environmental community – an extended family where everyone has equal right to fulfill the fullest measure of his or her potential. There are other commonalities. The vision of one earth, one family presupposes a new contract between people and nature on the one hand and, on the other, among peoples and nations – a contract characterized by interdependence and equity.”*
>
> Foreword by Klaus Töpfer, Executive Director of the UNEP to Agenda 21 (IOC, 1999, pp. 9-10)

OM’s Agenda 21 states that governments, sports organizations and athletes have a common interest in preserving the aquatic environment, the air, the food supply chain

and green spaces. Although these activities are of primary interest to governments, without the involvement of citizens and the use of all available means, they cannot be carried out. The commonality with the goals of Olympism has meant that the OM has recognized and accepted its responsibility to contribute to sustainable development, which is why it has developed its guide for all organizations that are part of the Olympic Movement, i.e. the IOC, the International Federations (IFs), the National Olympic Committees (NOCs), the Organizing Committees of the Olympic Games (OCOG), athletes, clubs, coaches and all people and businesses related to sport. Therefore, a role should be recognized for sports organizations and sports industries, according to the specific reality and circumstances in which they operate. The key point of the program is that the conservation of the environment finds meaning if its protection is accompanied by equitable economic, social and political development for all humanity, which should be able to satisfy their basic needs.

At their own level, members of the Olympic family are required to develop strategies, plans, regulations and activities consistent with the realities in which they operate and to look for agreements from local up to international level with political institutions in order to implement joint actions aimed at sustainable development. In particular, it is required that FIs give priority to initiatives in social environments that are disadvantaged for poorness, political reasons, discrimination. Furthermore, they should promote sustainable and socially aware consumption models with the use of goods that meet these requirements. They should encourage the use of traditional local materials in the construction of sports equipment and facilities, energy saving programs in the performance of sports activities and in the organization of events.

Another objective of the OM is health education which should become an integral part of sports education by taking an interest in nutrition, hygiene, the fight against contagious and infectious diseases, the protection of vulnerable groups and the health of urban populations, including support for vaccination and prevention campaigns, especially for respiratory diseases.

OM’s Agenda 21 also establishes the actions to protect and save water in sport, the methods of construction and integration of sports facilities in urban contexts, the use of temporary structures and their dismantling with restoration of the integrity of the spaces used, energy efficiency, the reduction and treatment of waste, the choice of sustainable and long-lasting materials also in consideration of the effects of natural agents and phenomena characteristic of a territory.

When sport is practiced outside sports facilities, therefore in natural environments, the conservation of the landscape should be guaranteed as a priority objective of the participants.

New constructions should be an option only in cases where the needs cannot be met otherwise, by renovating existing plants and limiting land consumption.

Sports equipment should use minimal energy and renewable material and encourage local technological and economic development with the use of local products, favoring those that meet certified ecological standards.

For travel, means that use muscle strength associated with sport, such as walking or cycling, should be encouraged and non-polluting technologies promoted. The power supply should be based on a supply chain that ensures hygienic conditions, respect for the working population and protection of the environment, waste reduction and recycling. Practices that involve risks of water contamination should be avoided, the use of water should be contained or excluded for sporting activities if can jeopardize the local water supply.

Biological resources and biodiversity should be respected and any sporting practice that involves environmental contamination and endangers plant or animal species by contributing to deforestation and soil consumption should be condemned.

The attention of the Olympic movement should remain high in preserving small cultural communities, women and young people.

OM’s Agenda 21 states also that IOC acts in collaboration with a considerable number of organizations (United Nations Environment Programme – UNEP, United Nations Development Programme – UNDP, World Health Organization – WHO, International Committee of the Red Crossion – ICRC, Green peace, World Wide Fund for Nature – WWF, National Olympic Academies – NOAs, International Council of Sport Science and Physical Education – ICSSPE; World Federation of the Sporting Goods Industries – WFSGI and International Association for Sports and Leisure Facilities – IAKS, organizations of athletes and other members of the sports world).

Finally, the Agenda places emphasis on awareness, education and training on environmental protection with the involvement of athletes in media-supported environmental education promotion campaigns. This program is still in the research and development phase (IOC, 2019b, p. 11).

5.3 Technical Manual on Olympic Games Impact

This chapter deals with presenting the system of impact indicators that the IOC requires OCOG to monitor in the host city for a period of 12 years. The main criticalities of the criteria adopted will be illustrated as they emerge from the studies available in the literature.

Measurable benchmarks need to be established to evaluate the outcome of actions.

> "*The lack of agreement on the meaning of the principal constructs of the sustainability concept - needs and development - presents significant challenges to its governance as it requires a substantial capacity to predict the future and to handle uncertainty*" (Girginov, 2020, p. 406).

The clearest attempt regarding the sustainability of OGs is the *Technical Manual on Olympic Games Impact* (OGI) program (IOC, 2007a), the salient features of which are outlined below.

It is a document that constitutes the first methodological and systematic approach to evaluate the activities that are carried out by OCOG and make further knowledge available in order to increase the sustainability of edition after edition of the Olympic Games. It should be noted that prior to the Sydney 2000 OGs, there was no Transfer of Knowledge (TOK) between OCOG and OCOG (IOC, 2014a, p. 24).

The "Technical Manual on Olympic Games Impact" (OGI) (IOC, 2007a) is part of the contract between IOC and OCOG. It provides indicators divided into the three spheres economic, socio-cultural and environmental. The indicators cover three territorial areas (state, region and city) and are measured over a period of 12 years, from 2 years before the assignment of the games to the candidate city up to 3 years after their conclusion (IOC, 2012a).

The Academie Internationale des Sciences et Techniques du Sport (AISTS) researchers, commissioned by the IOC to develop the OGI evaluation system, used grouping and refinement criteria and for each sphere they identified the categories of activities that can be influenced by the Games (for example, the natural system and the built system); furthermore these categories have been divided according to homogeneous measurable criteria. A total of 126 event or context indicators were determined (e.g. for "air quality"

EN-5 is an event and context indicator, EN-4 for context, EN-20 for event - see Table 2). The section "Paralympic-specific information" is also part of the OGI manual.

Below is the table containing all the indicators.

Table 2 – Environmental indicators (IOC, 2007a, p. 13)

EN-1	Renewable Fresh Water Use	EN-13	Road Congestion	EN-25	Indoor Air Quality
EN-2	Public Water Supply	EN-14	Energy Consumption by Source	EN-26	Capacity of Olympic and Paralympic Venues
EN-3	Water Quality	EN-15	Energy Consumption by Use	EN-27	Life-cycle Inventory of Olympic and Paralympic Venues
EN-4	*Greenhouse Gas Emissions*	EN-16	Energy Self-sufficiency	EN-28	Operating and Maintenance of Olympic and Paralympic Venues
EN-5	*Air Quality*	EN-17	Raw Material Consumption	EN-29	Olympic induced Transport Infrastructure
EN-6	Land Use Changes	EN-18	Solid Waste Treatment	EN-30	Olympic Transport Impacts
EN-7	Protected Sites	EN-19	Wastewater Treatment	EN-31	Olympic Energy Consumption
EN-8	Threatened Species	*EN-20*	*Greenhouse Gas Emissions of Olympic Games and Paralympic Games*	EN-32	Solid Waste Production of Olympic and Paralympic Games
EN-9	Housing Areas	EN-21	Olympic-induced Land-Use Changes	EN-33	New Waste and Wastewater Treatment Facilities
EN-10	Public Open-air Leisure Areas	EN-22	Olympic and Paralympic Venues in protected sites	EN-34	Life-cycle Inventory of Olympic and Paralympic Games
EN-11	Transport Networks	EN-23	Food Production Consumed during Olympic Games and Paralympic Games		
EN-12	Daily Travelling Distance	EN-24	Olympic induced Housing		

The measured values are used to verify the variation of the observation period and comparatively with subsequent events, in order to build longitudinal references of the OGs: "*The Olympic Games Impact study is an objective study measuring facts as they occur on the basis of pre-defined indicators and analyzing them. Impact should not be estimated in advance ("there could be an impact / there could not be an impact" based on suppositions or experience) as only observation over time will show if there was, or not*." (IOC, 2007a, p. 26)

In the intentions of the IOC, OGI is a means to assess the effects of certain actions and modify them even at an early stage if necessary: monitoring at all stages of OGs can allow to avoid / reduce negative impacts and improve positive legacy. OGI is also a tool available to OCOG to promote a positive and favorable local information campaign to host OG. Furthermore, OGI determines the collection of long-term information with the

same indicators in all editions of the Games which can help the evaluation for future host cities, regions and countries.

As mentioned above, OGI has been introduced by the IOC on a voluntary basis as a game impact control system, and became mandatory for the OCOG since London 2012 (ESRC, 2010, p. 6). This makes it a tool for responding to criticism from those who fear the negative environmental and economic impacts of OGs and therefore oppose their staging. Of course, this does not exempt it from criticism. An analysis and synthesis of OGI's weaknesses was proposed by R. VanWynsberghe (2015, p. 6-7): the limited duration of the measurement of the indicators does not allow to evaluate the long-term effects; the lack of subsequent longitudinal studies which are only suggested; the absence of qualitative data for a better understanding of the perception of the local community; the absence of tools for a causal link between indicators and OGs; the collection of the data is limited to the country only; lack of an integrated sustainability assessment; lack of reference standards to be respected that make it possible to establish whether the objective of sustainability has been achieved; lack of data collection that would allow the OGs system - host city to be contextualized.

Based on the ineffectiveness of the OGI tool identified in the criticisms, the declarations of intent of the candidate cities to host OGs could only serve to overcome the competition, especially since there are no objectivable objectives, no penalties are even envisaged in case of failure to achieve them (Pentifallo & VanWynsberghe, 2012, p. 433).

It could happen that:

> *"bidding cities have "talked green" in order to be considered a serious contender to win their hosting proposal"* (Johnson & Ali, 2020, p. 322).

For this reason, R. VanWynsberghe proposed to integrate the OGI system by providing: same measurements also on cities similar to the one hosting the games in the same period of time; assigning weights to the OGI indicators in relation to accuracy, reliability and relevance; add indicators both qualitative of the social reality of the city and relating to the infrastructures already present in the host city at the time of the bidding proposal; identification of sectors useful to leverage the event (2015, p. 10-12).

Other authors (Scandizzo & Pierleoni, 2017, p. 1) have pointed out that ex ante studies tend to emphasize benefits and underestimate costs.

Those who used OGI questioned its effectiveness in detecting the parameters it intends to measure and in finding causal relationships with the staging of the OG. Infact, in the pre-Games report, for London 2012, we read:

> *"In both the environmental and economic cases these figures reflect the relatively few areas where it is possible to say with confidence that there has been an impact and further an impact that is due to the Games"* (ESRC, 2010, p. 23).

Before concluding I will make some hints on how it is possible to evaluate the environmental impact. Physics teaches that all its phenomena / processes concern the use and transformation of energy and matter. Their flows determine the impact of the single phenomenon / process on the earth's physical system given the fact that both energy and matter degrade e further energy is needed to restore the initial condition. In order to be able to estimate in advance the overall effect of all processes, a homogeneous measurement system should be used.
Different quantities can be used to account for the effects on the particular environmental system to be preserved.

For example, the ecological footprint (EF) of the land consumed indicates the amount of equivalent surface used in the process. This approach involves considering a process in all its parts, each of which contributes to determining the overall environmental footprint. No matter what the process, building a sports facility, producing a portion of fruit or taking a trip - the analysis will provide comparable outputs. It is also possible to compare processes that differ in some respects. For example, Collins, Jones and Munday suggest measuring the difference in the impact of a visitor who participates in an event compared to staying at home (2009, p. 831).

Examples of other indicators are CO_2 emissions (carbon footprint) and water consumption (water footprint). Carbon footprint is considered an excellent indicator both because it gives a good indication of the use of energy sources used in production cycles, and because it constitutes one of the main threats to climate change (IPCC, 1995, p. 4).

By extension, this approach, once a certain economic system is known, allows us to estimate the overall impact based on the expenses of visitors in the place where an event is held, divided between travel, food and other expenses for the stay (Gillentine, 2020).

Although the system described is based on simple criteria, data on all products and processes are not available and these are not generalizable because they depend on factors such as the place, the procedures used, the energy sources and the raw material. Therefore, the overall determination requires a specific analysis of all processes such as (non-exhaustive list): public participation, travel, consumption of food and type, use of all services, production and disposal of waste, media; the duration and type of services used by visitors before, during and after the event for their stay in the place; construction, maintenance and management services for sports facilities; long-term tourism phenomena; the distinction between the local effects of the event and the distribution and magnitude of the short- and long-term global effects; the distribution of net spending between visitors and residents; the crowding out of resources and services with respect to not organizing the event or doing something else. CO_2 emissions targets are generally about control and the term "reduction" is used, which is clearly misleading. In fact, a series of actions would actually be necessary, including that of sequestering CO_2 from the atmosphere (IPCC, 2018, p. 21), and it is not enough to be content with releasing a little less of it by improving the quality of processes. The zero emissions goal is the one that really corresponds to satisfying one of the requirements for not having an environmental impact. Therefore, the zero emissions objective should be pursued, which should be broken only for basic human needs if it is not possible to satisfy them otherwise.

In conclusion, the comparison of positive and negative effects on different spheres, despite the commitment of the IOC repeated also in the Technical Manual on Olympic Games Impact *"to promote sustainable development in sport and to require that the Olympic Games are held Accordingly"*, (IOC, 2007a, p. 11) should serve to verify the actual existence of a positive legacy of OG as an objective achieved "through" sport. However, OGI has not yet been able to be the sustainability verification tool it should be.

5.4 Environmental achievements in recent Olympic Games

Below I will illustrate some of the environmental objectives achieved in the recent editions of the OGs, which correspond to the period of greatest commitment of the OM for the environmental cause. The results, although spread in many areas, have still been modest and much remains to be done.

The goal of games sustainability was introduced in the Lillehammer games in 1994 and the significant results came after nearly 20 years, in London 2012 (IOC, 2014a, p. 15). The objectives set up to then by the organizers have focused on fairly obvious environmental issues including avoiding the "white elephants" that is, the unused infrastructures after the OGs. Even this relatively simple goal has proved extremely difficult to achieve, since enormous unused facilities remain with other urban planning needs that were not met at the expense of desolate city districts.

The 1976 Montreal Olympics and 2004 Athens Olympics are clear examples of some long-term negative legacies in the form of debts and unused sports facilities. Therefore, the declaration in the bidding process to achieve positive legacy has turned into unplanned and negative outcomes. Past examples remind organizers that OGs are probably the highest risk event in contemporary society (Flyvbjerg & Stewart, 2012, p. 3).

The table below, starting from the results achieved in recent editions of the Olympic Games, aims to identify the direction that should be affirmed in the OGs of the future to achieve the ambitions of Olympism in terms of environmental and sustainability.

Table 3 summarizes the main activities related to the preservation of the environment conducted in the latest Olympic editions (IOC, 2014a).

Table 3 – Enviromental achievement during Olympics

Winter/Summer	W	S	W	S	W	S	W	S	W
Year	2002	2004	2006	2008	2010	2012	2014	2016	2018
Hosting city	Salt Lake City	Athens	Turin	Beijing	Vancouver	London	Sochi	Rio	Pyeongchang
Forestation	X	X		X					
Ecological transport		X		X					
Reduction of Air pollution		X		X					
enhance public sewage/ waste treatment systems				X					X
Water resources saving					X		X		X
Eco excursions		X		X	X	X			
Ecological vehicles		X							
Coordination activities with		X				X	X		

Winter/Summer	W	S	W	S	W	S	W	S	W
Year	2002	2004	2006	2008	2010	2012	2014	2016	2018
other entities									
Biodiversity							X		X
Energy efficiency Renewable energy			X	X				X	X
Educational programs								X	X
Reduction of architectural and cultural barriers of disability						X	X		
Technological innovation		X				X	X	X	X
Low carbon iniziative/green house gases compensation			X	X				X	X
Soil compensation									
Increase of urban green areas				X					
Green facilities				X	X	X		X	X
Well being and healthy living					X	X	X		
Reporting System International Standard			X		X	X			

The London games were a turning point thanks to the adoption of environmental certification criteria (CSL, 2010, p. 56).[6]

However, even for London carbon offsetting measures have not been adequate (CSL, 2013, p. 90). The contradiction emerges regarding the effective possibility of attracting millions of people to a city, investing in facilities (albeit with the prospect of use even after the games) and infrastructures and doing so in a sustainable way for the environment. The harshest criticisms indicate: *"Sustainable Olympic legacy is also an ambiguous concept, as it tries to satisfy the games' insatiable drive for faster, higher, stronger (growth) while delivering equality, solidarity and accountability across all sports and groups around the world"* (Girginov & Hills, 2008, p. 2093).

The London Olympic Games Organizing Committee (LOCOG) has natively integrated sustainability into its program. This has resulted in an increase in the complexity and costs of planning but has formed the basis for implementing a project with concrete chances of success. Among the promises of LOCOG was the legacy of an Olympic Park capable of setting an example of sustainable life (CSL, 2010, p. 7). By integrating sustainability into the heart of the project (p. 11), the environmental and socio-economic

[6] ISO 20121

renewal of the area of London concerned should take place around it, in harmony with the priorities perceived at the local level for decades [7].

In the same period in which the LOCOG was operating, studies began to proliferate to verify under what conditions it is possible to justify huge public investments by the host cities through holistic planning strategies capable of enhancing the opportunity given by the OGs. Research has flourished to understand how to measure the legacy of mega events and draw inspiration from past experiences that were precursors, such as the cases of Munich 1972 and Barcelona 1992.

Although the data collection does not include Rio, as it is not provided in the IOC summary documents, the attention to environmental objectives was significant only in London, where some results were still lacking, such as the reduction of CO_2 emissions. However, the example of London, with the adoption of certification standards and organizational criteria that integrate sustainability, constitutes a reference model for future efforts in the field of environmental protection, which should also be inspired by the criticisms of opponents.

5.5 Risks inherent in the city hosting the games

As we will see later, the possibility that OGs are sustainable does not only concern environmental aspects, but also economic and social ones. Therefore it is not only necessary to worry that sports facilities are not built that will not be used and that the effects of increased traffic and possible pollution are evaluated. I consider it appropriate to also take a look at the financial and social criticalities, leaving the exploration of the dissent of the opponents of the games to the next chapter. The possibility of staging OGs, solving economic aspects and many issues raised by opponents, and of staging them in a sustainable way also for the environment, are part of the same discourse. The scenario that emerges is the "mega" dimension of the budgets, the presence of corruption risks and damage to the public interest by the private sector, the possibility of increasing inequalities.

The first critical point arises from the process in its entirety which, although extended to a time period of 12 years, is hugely challenging and therefore responsible for generating a sense of urgency in the city that hosts the OGs. For this reason, some scholars argue that

[7] *"the land and waterways were highly contaminated as a result of decades of industrial pollution and contained several invasive species such as Japanese Knotweed and Giat Hogweed"* (CSL, 2010, p. 34),

mega events such as the Olympics act as catalysts for efforts that cities would not otherwise support, attract the interest of public opinion and politicians and allow for the gathering of energy and funding enhanced by the urgency of meeting the Olympic deadline (Essex & Chalkley, 2003). The climate of excitement and enthusiasm including the appeal of considerable positive energies does not exempt the cities hosting OGs from the great risks associated with their staging. Below are some unwanted effects of the Games which will be further addressed in the following paragraphs.

In order to attract and host more spectators and tourists, organizations requiring a considerable workforce are created or strengthened; to increase national prestige through new sporting successes, the entire sporting movement of the host nation is supported and initiatives in support of people's physical well-being and moral vigor proliferate.

It is shown that, although the initial and immediate momentum of the mega events is indisputable, lasting negative effects may occur belatedly on the local population living in conditions of economic and social hardship with an aggravation of the differences between social groups due to the increase in the cost of living (Steiner, Frey, & Hotz, 2013, p. 23). Indeed, the cost of living may rise more than income growth despite new jobs. Most OGs-related jobs are temporary, low-wage jobs. The effects of land use for the construction of sports facilities are environmental and economic and lead to an increase in the value of homes and rents to the detriment of the neediest. The city's choice to host OGs depends on the sustainability of the economic commitment and the prospect of benefits, while at the same time there is the risk of aggravating differences and increasing disparities within the nation. Governments are often forced to intervene to finance the works necessary for OGs with the prevailing advantage of the territory of the city that hosts them, and the taxation of citizens is disproportionate and unequal compared to the advantages. Albertville had a very heavy negative economic balance estimated at USD 57 billion (Burton & O'Reilly, 2009, p. 2). The 1992 Games in Barcelona, often portrayed as an example of a city taking advantage of the opportunity, resulted in a debt of over USD 4 billion for the Spanish government with inequality at the expense of other citizens (Tavakkoli, 2016, p. 49).

Returning to the issue of numbers and associated criticisms, the cost of Sochi's winter OGs against a USD 12 billion budget resulted in an estimated final outlay of USD 51 billion (Baade & Matheson, 2016). The same amount is higher than the Gross Domestic Product (GDP) of Ghana, a country that occupies the 84th position in the world (sources

from the International Monetary Fund - www.imf.org) out of 198 surveyed nations. The same amount represents 5% of the GDP of Indonesia, the 16th nation in the world by GDP. We can better understand the weight of OGs from an economic point of view with respect to the wealth of nations. The places and nations that organized the OGs are a restricted "club". The 32 editions of the summer OGs (up to 2032 and excluding editions not held), have been or will be hosted only in 24 cities and 19 states, 11 of which are European.[8] All G7 countries hosted at least one edition while 18 editions were held by G8 countries. The country with the lowest GDP that hosted the games is Greece, 40th in the world.

In any case, based on specific situations, it was highlighted that there could be a positive balance in hosting OGs in developing countries (Wnorowski, 2011).

The phenomenon of gigantism of events and the complexity of the works to be carried out makes it difficult to avoid all negative impacts (Müller, 2012, p. 704).

In his study Tavakkoli (2016) provides many elements regarding the reasons that affect the economic balance of OGs. The examples above indicate that a city's ability to complete the project depends on the central government making a commitment to compensate for the financial difficulties that arise in the decade from the start of the bidding process to the final ceremony of the games. Unlike what happens for the FIFA World Cup (FWC) in fact it is a city and not a nation responsible for the organization. The economic support of the state can be decisive but it can aggravate internal disparities, financing the city that hosts the games with large common sums. Furthermore, the effect of public-private cooperation for the Olympic cause can degenerate into benefits for individuals and damage to the public interest. Other determining factors are the economic situation, the security framework required in relation to any threats to public order, the attitude of the local population that conditions economic development, corruption, the appropriate preventive estimate of the activities to be carried out, the adequate execution of the works that could be affected by the need to reduce time. The coverage of expenses will then depend on the influx of people as spectators.

A further perspective is given by the leveraging action that mega events such as OGs can carry out in the social, economic and environmental dimensions (people, profit, planet) and extend their effects beyond the ambition to deliver the games. To do this, it is

[8] these data were processed by the writer himself simply by consulting the list of cities that have hosted all editions of OGs on the site https://www.olympic.org/

necessary to plan and support the leverage effects with targeted actions, identify who is responsible for their success in agreement with the local authorities, as OCOG cannot replace the responsibilities that belong to democratically elected politicians (O'Brien & Chalip, 2008).

In conclusion, the economic aspects are a huge attraction for the candidate cities and many expenses are covered by central governments. The fact that there are still cities interested in hosting OGs seems to confirm the confidence that they can achieve the expected benefits.

5.6 Opponents to the organization of the games and the efforts of the IOC

A growing number of protesters are taking action to prevent their cities from hosting OGs. To fulfill the IOC's mission of staging OGs, their reasons should be seen not only as a wake-up call but rather as an opportunity to gather suggestions and improve the organization of all environmental, economic and social aspects. Otherwise, the IOC will find fewer and fewer cities willing to host OGs. The main reasons for opposition to OGs supported by some parts of the local community will be presented below.

Throughout the period of just over a century of the modern Olympic Games, the Olympic movement has experienced constant crises, the use of sport for political purposes, boycotts and terrorist attacks (Guttman, 1992). Protests with respect to the organization of the games are a phenomenon that has occurred continuously since 1968 (Mexico City) and has significantly affected above all the cities that are candidates for the winter games, characterized by smaller dimensions and more delicate environments and more exposed to the effects of possible damage (Goldblatt, 2016). Opposition to the expense of staging OGs and the lack of confidence in the IOC and OGOG takes place through media campaigns (for example "NOlympics Anywhere") and street demonstrations as happened also in East London (BBC, 2012).

Some scholars criticize that the Olympics are precisely the most globalized and commercialized event and doubt on the criteria for choosing the host city by the IOC (Palmer & Larson, 2015), (Wamsley, 2004).

The enormous economic resources required have made clear what Dr. Thomas Bach himself, president of the IOC, admitted in 2014:

> "*Sport must remain independent of politics, yet there must always be an awareness that its decisions can also have political consequences*" (Olympic News, 2014).

A clear separation of the organization of OGs from politics and social reality is no longer possible, and sporting events integrate the development of a community.

The consent of the citizens of the city hosting the games plays a fundamental role in the acceptance of the candidacy and on 6 occasions the organizing committees have renounced the offer due to the negative outcome of local referendums (Valvur, 2018). The referendum is a truly clear way to separate what is the intention of the political class from what is the will of the population (Hiller & Wanner, 2015). Raising the issue is an opportunity to mobilize people, discuss, deploy all energy, try to bring together the ambitions of the OGs and the interest of the host community.

During the 7-year period [9] from the acceptance of the candidacy to the unfolding of the games, the OCOG faces an innumerable series of problems that expose it to easy criticism from the opponents of the games. Knowing this phenomenon and managing it can contribute to the search for consensus and collect useful suggestions in the organization process in order to meet the expectations of all citizens, share objectives and enhance their criticisms. The criticism of the games requires a structured approach to the main aspects of the opposition: costs, the distribution of resources, the relocation of jobs; environmental damage; opposition to some governments of host or participating countries; sponsors; corruption, the decision-making role of the IOC considered too conditioning the host city; [10] the increase in traffic, overcrowding (Deery, Jago, & Fredline, 2004) the crime rate, prostitution and alcoholism (Ritchie, Shipway, & Cleev, 2009).

Regarding the mega-event and the role of the city government, Hiller (1999, p. 182) indicates that "a sense of urgency" is responsible for many of the problems that arise during the organization of OG and adds:

> *"A mega-event is normally sponsored by a body outside of the city or country in which the event is hosted that establishes the parameters and ground rules*

[9] Even more considering the progressive extension of the programming established by the IOC.

[10] "*Also, their governing body, the IOC, with its aristocratic constitution and ambiguous agenda, provokes opposition both with its authoritarianism toward hosting countries, and its ambiguous political decisions"*. (Zervas, 2012, p. 533)

> *for the event. Thus, in an important way, ultimate control of the mega-event does not rest with the host city, which is increasingly expected to provide financial guarantees and comply with other rules and timelines set by the sponsoring body. The awarding of a mega-event to a city is often contingent on the city meeting these external obligations in relation to a fixed date, which creates a sense of urgency that is not always conducive to urban democratic processes and established long-term planning goals."*

The perception of an unequal distribution of benefits among the population and an increase in disparities (Fredline & Faulkner, 2003) (Horne & Whannel, 2012) as a consequence of real estate speculation (Ritchie, Shipway, & Cleev, 2009) and the increase in the rates of all goods and services constitutes a dominant element of the opponents of games.

Other central themes of the opponents are the belief that sports facilities are oversized and useless for the future life of the host community and that the same economic efforts should be better directed to the resolution of social and urban problems (Zervas, 2012). Other criticisms are directed towards the sponsors of the games. Despite the programs developed since 1985 by the IOC to establish stable relationships and common objectives with Olympic sponsors (The Olympic Partner program - TOP program), the skepticism about the social responsibility of large companies that allow the games to be run through their financial commitment is linked to the belief that they do it to take advantage of the Olympic flag for private commercial and economic purposes, encouraging the consumption of unnecessary products especially among young people (Coburn & McCafferty, 2017).

In order to contain the gigantism of OGs, the IOC has decided to limit the number of sporting events (IOC, 2014b, p. 14) The criteria for doing so have also been criticized. According to Hiller and Wanner (2015) the criteria for introducing, maintaining or excluding a sport from the Olympic program have the potential to discriminate sports disciplines on the basis of their ability to be spectacular, suitable for the media, approved by some social and economic realities, considered, by the IOC, best able to serve for the educational and aesthetic purpose of the OM.

Wamsley with regard to the educational capacity of Olympism writes:

> *But, generally, given the evidence of the twentieth century, it is suggested here that we cannot look to the IOC or the Olympic Games to initiate and sustain a humancentred peace movement, one of the fundamental tenets of Olympism. Indeed, the problem with Olympism is the Olympic Games. All things considered, the Olympic Games of the twentieth century are a paradox. The basic contradiction is that the games, in their contemporary incarnation, are the antithesis of the very Olympic ideals they ostensibly cherish. From this assertion emanate two suppositions for exploration: first, the Olympic Games do not need Olympism, they negate it, and would be much more honest, and therefore humanistic, without it. Second, that Olympism does not need the Olympic Games.* (Wamsley, 2004, p. 234)

Finally, there is skepticism in relation to the possibility of achieving sporting successes by hosting OGs:

> *"In general, evidence suggests that in terms of economic impact and development, a city's or nation's having some "Olympic strategy," either serving as host locale or a financial commitment to increasing the success of its own athletes in these competitions, does not usually constitute a wise economic investment"* (Sanderson & Shaikh, 2020, p. 46).

In conclusion, the criticisms of the games concern many areas of their organization and of the Olympic movement itself. The economic, environmental and social justice aspects are the most controversial issues.

5.7 Legacy and sustainability of the Olympic Games

Through the documents that for years have guided the IOC, the OCOGs and the entire OM, the approaches for managing the sustainability of OGs have been discussed. The results achieved by the most recent editions in terms of sustainability were presented, highlighting the economic risks and the reasons of opponents to OGs. How all this information has been gathered and leveraged by the IOC in recent years to address the sustainability challenge by 2030 is the goal of this chapter. The IOC's new strategy to achieve the sustainability of OGs and their positive legacy will be addressed. The legacy of the Games, not discussed until now, will prove to be functional and integrated with the

ambitions of sustainability, with very large overlapping areas. The reference will be the IOC's strategic documents on sustainability (IOC, 2017b) and on legacy (IOC, 2017b), which highlight the beginning of a new period in which the IOC and the entire OM will have to demonstrate that they translate their vision into action.

The term legacy has been used since the 1950s (Leopkey, 2009, p. 7) but its introduction into the Olympic Charter took place in the edition in force in 2004 (IOC, 2004, p. 12) as a consequence of the Symposium held in 2002.

As already reported in chapter 5.1, in the OC it is written:

> *"The IOC's role is:*
>
> *15. to promote a positive legacy from the Olympic Games to the host cities, regions and countries"* (IOC, 2020, p. 17).

Defining the concept of legacy is the first step in identifying how OGs should be staged to achieve it.

Scholars' research to define aspects of the legacy had already begun. The absence of a formal definition by those who used that word made legacy an arbitrary umbrella to cover one's ends rather than an operational tool.

> *"word legacy, however, is elusive, problematic and even a dangerous word for a number of reasons. When the term is used by organising committees, it is assumed to be entirely positive, there being no such thing as negative legacy when used in this context. Secondly, it is usually believed that legacy benefits flow to a community at the end of the Games as a matter of course. […]. Thirdly, legacy is often assumed to be self-evident, so that there is no need to define precisely what it is"* (Cashman, 2005, p. 15) in (Preuss, 2007, p. 84).

In 2009, Leopkey (2009, p. 5) collected the legacies of OGs in table form, classifying them into "*planned and unplanned, positive and negative, intangible and tangible*", according to the definition of Preuss (2007, p. 86). Preuss himself, referring to the etymology of the word in the Anglo-Saxon area, pointed out that legacy implies a

voluntary act of those who leave it (p. 84).[11] This involves knowing not only the intention to leave a legacy, but what to leave.

The identification and classification of the aspects that could contribute to the legacy of OGs allowed for the acquisition of knowledge. Finally, since 2017 the legacy of OGs and the ambitions for their sustainability have been formally specified by the IOC, who has also defined its own role in the whole process. The focus can now shift to the measurements of the stated goals as the IOC has clearly expressed a willingness to achieve them. The sustainability and legacy goals for OGs declared by the IOC are summarized below.

"IOC Sustainability Strategy" (IOC, 2017b) provided the first systematic organization to sustainability ambitions by identifying 3 spheres or responsibility with 18 objectives (IOC as an organization, 9 objectives; IOC as a owner of the OGs, 4 objectives; IOA as a leader of the OM, 5 objectives) and 5 focus areas with a total of 17 intents (p. 5):

- Infrastructures and natural sites (6 intents: use of existing infrastructures, minimum environmental impact, legacy, protection of greenery, respect for local culture, air and water quality);
- Procurement and resource management (2 intents: responsible production; optimized life cycle);
- Mobility (3 intents: friend of the environment; social friend; sustainable tourism);
- Workforce (4 intents: health, gender equality, education; compliance with protocol and laws);
- Climate (2 intents: carbon reduction, event planning accordingly).

The same document establishes that sustainability is one of the 4 working principles of the OM along with universality and solidarity, unity in diversity, autonomy and good governance. The mission is to ensure the celebration of the Olympic Games, with the athlete at the center, for the promotion of Olympic values in society (p. 16).

After this publication, further documents belonging to a series called "Sustainability Essentials" have been published. They address specific issues such as measuring the carbon footprint of games, sustainable sourcing, the Plastic Game Plan for Sport, climate change and the sustainability of sport. Progressively, with a notable acceleration and after

[11] *Sense of "property left by will, a gift by will" appeared in Scottish mid-15c* (etymonline, n.a.)

years of relative poverty or little in-depth analysis of official sources, the IOC is shaping its own solid documentary basis to address environmental issues.

On its website IOC has dedicated an entire section in which documents that deal systematically with every environmental problem are being published (IOC, n.a. g).

In the same year the "IOC Legacy Strategic Approach" defined 4 objectives divided into items. The key points are: the legacy that is intended to be achieved with the staging of the OGs must be agreed first with the OCOG and then integrated into the organization and continuously monitored; it must be documented, celebrated and shared; it is necessary to consolidate the World Union of the Olympic cities and establish new partnerships (IOC, 2017b, p. 3-4). The IOC has arranged for the collection of relevant information on the site by dividing the aspects of the legacy into: people, cities, sports, Olympic Venues (IOC, n.a. a).

In the appendix, Table 6 page 156, I try to verify whether the elements of legacy identified by Leopkey (2009, p. 10-11) through her literature review have finally been covered by the strategic documents of the IOC. The additional columns, the content of which should be demonstrated, constitute at this stage only an exercise to try to grasp the general aspects. They indicate in which of the two contexts (sustainability / legacy) and to which objectives declared by the IOC to associate each element. The IOC covered all the aspects deemed relevant by scholars and also stated that "*it does not overlook pitfalls and negative results from its activities*" (IOC, 2017b, p. 15). The fact that many of the aspects have overlapping points between legacy and sustainability seems to be entirely consistent with the IOC's strategy. Already in the "Agenda 2020", in recommendation 4.3 (IOC, 2014b, p. 17), IOC had combined legacy and sustainability. Furthermore, the IOC requires both to be integrated into the entire process of organizing OGs (IOC, 2017b, p. 2-3). Since 2014, the IOC Sport and Environment Commission (SEC) has been transformed into the Sustainability and Legacy Commission (SLC) (Karamichas, 2020, p. 79). This is consistent with the theory of complexity (see also 3.1.3 page 27) and the very definition of sustainability that embraces and connects the three spheres (social, economic, environmental - see also page 10-12), that is, the same areas in which to build relevant legacies.

Therefore, the possibility of supporting the staging of OGs should be based on the OCOG's ability to measure the implementation of legacy and sustainability objectives.

While the OCOG may decide which legacies to work on, those that have direct environmental implications cannot be overlooked. The situation that arises no longer leaves room for mere intangible aspects precisely because they are the result of the same process of which the tangible ones are part, that is, the staging of the OGs as a whole.

This principle is recalled by the IOC itself:

> *"Olympic legacy is the result of a vision. It encompasses all the tangible and intangible long-term benefits initiated or accelerated by the hosting of the Olympic Games/sport events for people, cities/territories and the Olympic Movement* (IOC, 2017b, p. 12).

Their definition and the commitment to achieve them, together with forecasting and compliance with costs, assume the central role of the agenda. The depth or superficiality of the process of measuring and disseminating the results is a further indication of the credibility of the "good" event.

The "IOC Legacy Strategic Approach" (IOC, 2017b, p. 15) reports examples of tangible legacy, such as new sports facilities and urban infrastructure, and intangible ones, such as changes in attitudes / behaviors. Of the latter, it recognizes the greater difficulty of measurement but also the greater importance for people and society.

One of the intangible legacies expected by the IOC is the intellectual one, defined as "*all information and knowledge and assets in the form of new skills, know-how, content, methods, tools and other skills that have been produced or acquired for the purpose of organizing the Games. Olympic*" (IOC: 2012a). The Transfer of Knowledge (TOK) includes information useful for making sustainable choices.

Knowledge construction is also useful for measuring other intangible benefits. For example, Herrington (2015, p. 139-149), after the London Games, conducted a study to identify citizens' perceptions of the legacy of games, recognizing that many aspects considered positive by some are negative for others. This type of research constitutes a tool available to the organization of OGs to meet the expectations of the largest number of citizens of the host city, recognize the negative effects afflicting them and act accordingly.

This approach involves an extended organization capable of covering aspects of city life and contrasts with the simple purpose of finishing preparations on time. Edize and Ward referring to sustainability write:

> *Cities have popularly used powerful quangos, undertaking 'fast track' initiatives with uncomplicated objectives and limited local involvement or accountability. Sustainable development, in contrast, implies a carefully considered and calibrated process which engages with social and environmental as well as economic agendas, and involves local participation* (Edize & Ward, 2015, p. 163).

From this point of view, the London experience was a novelty and the Commission for a Sustainable London declared, before and after the games:

> "*We have always maintained that, taken in isolation, delivering and Olympic and Paralympic Games is an inherently un-sustainable thing to do. We therefore cannot call the programme truly sustainable unless the inspirational power of the Games can be used to make a tangible, far reaching difference*" (CSL, 2010, p. 3).

> "*On balance we believe there is sufficient evidence to conclude that sustainable practices inspired by the Games should outweigh the inevitable negative impacts of the Games over time*" (CSL, 2013, p. 2).

The aspects discussed by scholars relating to the criticalities of OGs both in terms of legacy and in terms of sustainability have been substantially acknowledged by the strategic documents of the IOC. In fact, since 2017, the IOC has indicated very clearly what are the results that must be achieved by the organizing committees of the OGs from now on, with a perspective of 2026. These documents represent an epochal change in the direction of the sustainability of OGs and must invest the entire Olympic movement. The IOC proposes itself as a leader in the transformation into action of its vision of sustainability through sport.

5.8 Conclusion

Many topics have been addressed in this chapter which together contribute to an assessment of the sustainability of games that includes their ability to respect the natural environment. Over time, the IOC has developed guidelines for both sustainable development, i.e the Olympic Movement Agenda 21, and environmental impact assessment, i.e. the Olympic Games Impact. The IOC has encouraged the transmission of knowledge, from OCOG to OCOG, in order to allow OGs to have a positive legacy on

host cities. Although these objectives have been declared in the OC for some time (1994 for sustainability, 2004 for positive legacy) on the whole, adequate criteria for evaluating results have not been provided for many years. This is evidenced by the modest results achieved in many editions of the OGs, with *white elephants* around the world, severe criticism and popular opposition movements. Acceptability criteria have long been lacking both in the environmental context, for example a limit of total CO_2 emissions, and in the economic one, as a budget ceiling, and for the legacy in its tangible and intangible aspects. Furthermore, no penalties have been envisaged in the event of failure to achieve the objectives declared by OCOG in the bidding process, giving the opportunity to make promises at the time of submitting their bids, without consequences in the event of non-compliance. The broken promises concerned both aspects of sustainability and legacy, in particular the intangible ones which are also considered by the IOC to be the main reason for the staging of OGs. The fact that there have always been bidding cities seems to confirm their opportunity to take advantages, at least on an economic level, in hosting OGs, thanks to their central governments intervening to balance their budgets. However, the number of offering withdrawals testify to strong doubts both about the effectiveness of the games in being environmentally friendly and about being the best option for host cities to build positive legacies. Opposition has been very strong for winter games that are believed to impact environmentally delicate territories and for summer games in democratically and economically developed cities whose citizens did not feel that hosting OGs was a positive opportunity. These cities and their citizens have preferred other strategies for investing their resources to pursue their sustainable development. Another aspect highlighted relates to the *mega* dimension of OGs which is not the one that best fits the concept of sustainability. They have never been hosted by cities of low-GDP countries. To date, the club of the cities that hosted the games is small and it seems difficult for cities from developing countries to join it (Griesbach, 2021).

Finally, with the latest strategic documents of the IOC, published in 2017, respectively relating to sustainability and legacy, all the objectives that the staging of OGs should achieve, the need to objectify them and the way to do it, have been clearly defined, including have evaluations carried out by third parties independent of the OCOG.

Considering the overall duration of the organizational process, the effects of these changes will be seen only when the first organized OGs are held, starting from the bid process, according to the new strategies of the IOC, therefore in 2026.

Therefore, a completely new phase is opening up and the opportunity to achieve the objectives set by 2026, in line with the United Nations 2030 Agenda, represents a great challenge. If won, it really could finally represent the success of the IOC and Olympic Movement vision for a better and sustainable world through OGs.

CHAPTER VI.

THE COVID 19 PANDEMIC AND SUSTAINABILITY IN SPORT

The year 2020 has shown that even the best planning cannot eliminate all risks and exclude the option of bankruptcy. The pandemic has highlighted some criticalities of the sports system that should be analyzed nationally and internationally:

- sport activities for all (gyms, fitness centers, introduction to sport) have been suspended in many countries in order to contain the spread of infections which is favored by the interactions typical of the context of these practices; for their continuation, low priority has generally been given and limited or no efforts have been made while other activities which expose to similar risks but which are essential, have never been interrupted even during the lockdown (European Parliament, 2020);
- Professional sport was stopped and, when it was possible to restart, the competitions had to be subject to safety measures including the limitation or absolute absence of the public (Triantafyllidis, 2020);
- a considerable number of events have been canceled or postponed and these include international championships as European Football Championship (UEFA, 2020) and the Olympics (TOKYO 2020, 2020);
- unorganized sporting activity carried out individually was allowed not only at home but also in open spaces (European Parliament, 2020);
- the postponement or cancellation of sporting events in 2020 resulted in a reduction of their environmental impact estimated at 1.5 billion less CO_2 emissions only for trips not made by spectators (Triantafyllidis, 2020);
- change in ways of training with certain sports (e.g. cycling and running) that have had less impact (Mutz & Gerke, 2021);
- during the pandemic there has been the spread of simulators and many people have dedicated themselves to esports. It is necessary to consider these technological trends and verify how they can give ideas for the change of traditional sports.

Sports practice, precisely because it is characterized by forms of aggregation, has for the first time found in this specific characteristic a critical aspect; the governments, already involved in the management of the pandemic emergency, have decided to intervene by

stopping the sport. After a 10-12-week break that occurred in many countries, the professional leagues were allowed to resume competitions. Sports with significant commercial revenues, strong sponsorships and television rights revenues were the first to do so. The championships resumed without spectators and with the adoption of expensive safety protocols, including the anti-Covid 19 test repeated constantly to the athletes (Reuters Staff, 2020).

The world of mass sport has instead found an abrupt stop and the restart has not yet taken place in many countries (Fisher, 2021). Individual sports activities carried out in very popular open places such as ski resorts were also closed (Stone, 2020).

Free individual practice was able to continue unabated and many people chose this mode of exercise in the absence of legal and safe alternatives.

The closure of sports facilities to the public and the risks of contagion of athletes have led to organizational choices, the effectiveness of which could be considered for the future.

Real Madrid Club de Fútbol - RMCF played its Spanish national tournament and UEFA Champion League (UCL) matches at the small Alfredo Di Stefano venue in Valdebebas.

This made it possible to carry out maintenance work at the Santiago Bernabeu (SKY, 2020), taking advantage of the fact that the matches must be played in the absence of spectators.

The characteristics of a sports facility are not strictly linked to the needs of the match itself but must be subject to further minimum requirements relating to services for spectators, VIPs, press officers and other specifications, as in the case of UCL (UEFA, 2018). At the time of construction, as we have seen previously, the evaluation of the capacity of a sports facility is made taking into account the regulations and needs of the sports club that uses it, taking into account the number and degree of participation of fans and other strategies of marketing.

Except for the need to compete safely and on regular playing fields, many of the existing facility requirements are useless for competitions without an audience. Even without a pandemic during the OGs in Rio and London, many sport venues were used below their potential as not all tickets were sold (Grohmann, 2016) (BBC, 2012). Even when the pandemic is over, after an expected return to fan participation in stadiums, the option of continuing to watch competition through TV and digital media may be more strongly

considered. These alternatives can be tested and the value and significance of physical participation in sporting events may change.

For the completion of the championship and the health protection of the athletes, the NBA and UCL finals were organized with a change of calendar and above all with the use of a limited number of sport facilities up to just one. In the case of the NBA, the Orlando "bubble" was created, in which all the athletes were isolated together with the appropriate health control measures throughout the final phase of the championship. From a sporting point of view, both events were successful (Washington post, 2020).

As for the OGs of Tokyo, a criticism can be leveled at the IOC which took a long time before deciding to postpone the games (Enya, Saini, Dankwa, Grassi, & Plakouda, 2020) and when it did it used the following communication strategy:

> *"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"*
>
> (TOKYO 2020, 2020).

The doubt has not yet been resolved whether the Games can take place next summer or whether they will be definitively canceled. The consequences of even the exclusion of the public remain to be evaluated. This would result in not having the revenues estimated by the Tokyo Organization Committee of Olympic Games (TOCOG). Cancellation could result in the renegotiation of contracts with sponsors and TV rights and the agreed amounts could be lost.

> *"With the future of the event still up in the air, the organizers and the Japanese government stand to lose the 277 million U.S. dollars invested into the new Olympic Stadium in Tokyo. Japan has committed a total of 13.4 billion U.S. dollars towards organizing the event"* (Lange, 2020).

IOC and TOCOG are probably developing a contingency plan that had never been imagined before, in order to limit or reverse the damage. If the infrastructure of the city of Tokyo, the sports facilities, the transport systems, the services, the technological systems, the urban plan and the entire legacy promised by the games remain intact, there will be only the regret of not having played the OGs. If, on the other hand, the tangible and intangible legacy were to fail, this will have a future impact on the organizational process

and the way to establish and control objectives. The Olympic Charter declares to use sport as a means to achieve other purposes. The cancellation of the Games would further highlight the risk of making an effort to obtain results outside the sport and of achieving failure due to lack of the means. This would give other arguments to what the critics of the Games claim, namely that OGs involve large expenses that should be incurred to directly meet the needs of the host city. Critics also argue that the stated goals are a lever to justify OGs while a city that has already addressed and solved its problems could host them more easily and would not suffer damage if they are not held. It should be noted that the application process has not proved sufficient to overcome the political, social and economic differences existing between many cities in the world and has failed to expand the club of possible candidates with many cities being excluded even from the very possibility of participating in the selection.

The answer to all these criticisms could be given by Olympism if there is a positive legacy on the city of Tokyo, even if the games are canceled. This would demonstrate that sport is a means and not an end and that when OGs can take place they ensure an intangible added value to the celebration of humanity. This could make Tokyo truly Olympic without OGs.[12]

We have to wait to understand what will actually happen and if, when and how OG Tokyo 2020 will be played. This can provide the IOC with insights into how to better organize in the future OGs sustainably including the eventuality that they cannot take place.

Home confinement and restrictions on practicing many sports have brought many people closer to simulators (Fakazlı, 2020). A noteworthy example is given by ZWIFT, a platform that allows to participate in training and cycling races. Participants are each in their own home, and the software and equipment protocols reproduce realistic racing conditions (ZWIFT, 2021). These solutions allowed not only to continue physical exercise, but also to maintain positive contacts with distant people who share the same passions and desire to compete.

The pandemic therefore may have left some food for thought:

- unorganized sport has greater resilience and this reconciles with sustainability;

[12] At the time this and the following sentences were written it was not known whether the Games would eventually be held.

- the phenomena of potentially aggressive sports tourism in the environment as they involve a large number of people in delicate environments, have been confirmed as critical during the pandemic; the economic consequences of this situation on local realities modified to accommodate a considerable number of tourists should not be overlooked;
- a portion of organized sporting practice in gyms and sports centers was deemed unnecessary and showed criticality with respect to other forms of practice which also have a lower environmental impact;
- the “richest” sports have resumed the championships even in the absence of spectators; we will have to see the effects on the change in budgets, on the investments in the facilities, on the reliability of ticket sales, on the salaries of athletes and technicians;
- increasing the gap between rich sports and those who can rely on limited budgets;
- possible increase in the disparities of athletes from different nations in relation to the resumption of training and the economic resources dedicated to them given the emergency in which many countries find themselves;
- review of the tournament organization formulas;
- revaluation of spectator accommodation in sports facilities;
- reconsider Olympism’s ambition to deal with things other than sport or to do it without necessarily dealing with the Olympics;
- build the legacy of OGs from the very beginning of the bidding process, also considering the possibility that they cannot be staged;
- better awareness of the environmental impact of sport to avoid unnecessary activities.

CHAPTER VII.

CONCLUSION

7.1 Environmental Olympism

Olympism is a philosophy of life and so is Environmentalism.

The Olympic Charter (OC) is rather vague: it indicates the direction in which to move, without operationalizing how to do it.

Living according to Olympism requires using the Olympism perspective to address every problem. For example, the Fundamental Principles (FPs) of the OC do not specify what training methods and substances athletes can take or what their behavior should be. However, the ambition of excellence, the balance of qualities of body and mind, the joy of effort and the (vague) principle of fair play (FP4) allow us to recognize what and who are authentic Olympians. Desirable direction, summarized in the vagueness of the FPs, does not require the philosopher to continually rewrite the principles from which to derive everything. Those who choose to experience Olympism make it pervasive in their lives, far beyond training and practicing sports, basing their actions on the few universal purpose-oriented principles embodied in the OC.

Similarly, the assessment of the ecological impact of the construction and management of a building requires a defined set of rules that institutions and scientists should indicate in detailed procedures. Meanwhile, Environmentalism enunciates a broad and vague concept of respect for the value of nature to inspire every behavior of those who embrace this philosophy of life with the ultimate goal of protecting the environment.

It is possible to associate the values of the Environmentalism with those of Olympism but the two philosophies have different assumptions. Olympism focuses on the centrality of humanity and the development of its potential. Environmentalism recognizes nature as a complex system with its own rights that could be violated by one of its parties; the best behavior of humankind is the most functional to a steady state aimed at the conservation of the ecosystem.

The Olympic sport to date has generated an impact on the environment and the possibility of continuing to practice it is threatened by the loss of the integrity of ecosystems and the effects of climate change. The International Olympic Committee (IOC) has responsibly introduced taking care of the environment among its tasks. An objective that remained

unfinished for many years and above all hidden in the Olympic Charter. In this work I have shown that environmentalism has a lot in common with the fundamental ethical principles of Olympism and for this reason it could be explicitly mentioned together with them. Not only should the environment be directly indicated in FP1 as a pillar of Olympism along with education and culture, but also used as a means to realize its philosophy of life, build a better world and celebrate humanity through sport. The IOC has identified three ways to take care of the environment: the support of awareness on environmental issues, the sustainable practice of sport and the Olympic Games (OGs) held in accordance with these principles. The first is based on education. I highlighted that the Olympic educational approach respects the dictates that scholars consider important for education in sustainability: addressing complexity and dilemmas; develop the ability to transfer educational experiences into practical life through critical thinking and choice criteria based on responsible priorities when there is no win-win options.

Complexity is by far the greatest obstacle for educational systems and therefore also for the Olympic one. The interactions between human activities constantly fall into the three spheres that together identify the scope of sustainability: environment, economy and people. The resulting system cannot be described by monodisciplinary approaches and requires extensive knowledge in many fields of knowledge. This not only makes the education of the learners difficult, but also the preparation of the teachers. Sport has the particularity of being able to propose complex situations to learners that have little effect on reality but which represent a training ground for life and allow them to transfer the skills acquired in daily practice. The importance of experiences lived in the environment in contexts that are not governed by the spirit of competition has been recognized. The latter hinders the birth of a relationship of harmony with the environment that is experienced as a place of competition or variable to be kept under control. Conversely, the experience of exploration and contact with nature brings the learner closer to it and facilitates the adoption of responsible behaviors that are no longer the result of reasoning oriented towards convenience typical of the anthropocentric perspective.

However, studies indicate that significant environmental awareness milestones have not been achieved in most countries of the world, with sports education remaining centered on traditional aspects of sport.

In the education program for spectators, athletes, technicians and all people involved in sports, the difficulty of disseminating information to a very wide audience of people must be faced. It is precisely the number and diversity of people that reduces the possibility of providing everyone with the most appropriate message and therefore limits the effectiveness of communication. In fact, for the purposes of the individual path that goes from awareness of environmental issues to the choice of consistent behavior, up to the ability to be a leader and reference for others by promoting responsible behavior, everyone should receive adequate information in compliance with the level of individual advancement. The IOC is planning an athlete-based communications campaign as a role model but has not yet finalized its strategy.

Collecting the main aspects of interaction between sport and environmental issues in a table, I indicated the areas in which to adopt responsible behavior at all levels: for example the responsible use of sports equipment, green transport systems, the sustainable food chain, clothing and other products that use raw materials and energy responsibly, the drastic reduction in the consumption of non-renewable products, the containment of waste production through reuse and recovery practices, the creation of sustainable sports facilities, rules of the game that take into account impact on the environment and much more.

All this information is part of the educational messages to be spread by all the people who are concerned and are part of the sports world, even as fans. They also constitute the starting point for good practices, capable of removing the obstacles that make responsible choices difficult. Behavior transformation depends on the availability of sustainable services, such as transportation, sports facilities, responsibly produced and affordable materials. Furthermore, it has been shown that there is a correlation between the degree of satisfaction of personal needs, economic availability and sensitivity to environmental issues, with greater attention from the richest people. This can lead to further discrimination as it is difficult for those who do not access resources adequately to adopt a responsible behavior for the environment. This shows that the environmental issue is part of a complex system which includes education but also economic and social conditions. This is also reflected in the options of sports federations, where some sports, mainly involving some social classes, can rely better than others on the willingness of practitioners to move towards environmentally responsible choices with the latter that can become engines of change. This concerns for example some sports such as golf.

The approach to sustainability requires the involvement of the entire sports movement. By leveraging the concept of identity and belonging and associating the image of the federations with environmental responsibility projects, these can be more easily embraced even by enthusiasts. This is not a green washing maneuver but a serious commitment to take care of the environment starting from the place where the sport is practiced. This should be done in a way that is consistent with the values that are proper to Olympism.

The whole intermediate level of sport should operate in such a way as to remain in contact with the territory and act locally in harmony with social, cultural and economic resources. For example, it should initiate collaboration with universities, energy and water suppliers, waste and transport managers, organizations that care for the needy, young researchers. Any level of the sporting organization has the possibility to act because even a small local initiative contributes to the great environmental cause and to act as a lever within society.

A critical aspect for all levels of the Olympic Movement is the construction and management of sports facilities. Everyone should assume their responsibility in organizing sporting events in sustainable facilities and in sustainable ways themselves. It is desirable to introduce certification and control systems by the federations capable of verifying how the whole movement of sport keeps in mind the environmental aspects in every context and that it makes every effort to reduce its impact with predefined programs. It involves carrying out specific measures concerning the consumption of energy, water, soil, emissions, waste production, improper use and waste of raw materials and establishing limits and activities to mitigate and compensate for the consequent impacts. Furthermore, by acting on the regulations, virtuous behavior should be promoted in the context of competition in order to ensure its sustainability and to lead by example. An athlete who voluntarily breaks a racket or throws a food wrap on the street during a competition clearly manifests neglect and is to blame precisely because this behavior constitutes a threat to the environment. The message that the athlete can let go or take care of the performance while someone else has to take care of the damage and waste is blameworthy. It is precisely the huge number of practitioners, ranging from budding athletes to those of international fame, contributing to the environmental impact deriving from travel and the use of environmental resources. Added to this are the travels of the spectators, who have proven to be the main responsible for the carbon footprint, together with the sport facilities.

The universe of sports centers, the production of tools, the countless journeys of practitioners, the production of sportswear, the eating habits of athletes and their fans, training techniques and health and hygiene practices related to sport, consume enormous resources and produce an environmental impact that they should deal with directly.

Furthermore, to meet everyone’s educational needs, it is appropriate to rethink sustainable ways of practicing sport by removing obstacles to change and orienting it towards responsible choices. We are witnessing more and more the assault of natural spaces outside the urban boundaries, in search of fun and entertainment in non-anthropized environments with the spread of continuously innovative sports that are more often responsible for increasing consumption than for protecting the environment. Conversely, the usability of green spaces in the vicinity of all sports facilities should be facilitated, through collaboration with local realities in order to promote the sustainable development of cities. Moderately man-made contexts adjacent to or integrated into urban contexts should respond to the needs of contact with nature and constitute a brake on the further consumption of intact spaces that could be compromised by an unwary crowding of do-it-yourself sports tourists of dubious environmental awareness.

Billions of people play sports, from grass level to world level champions. Everyone should have an environmentally friendly approach. Where it is not possible, despite efforts, to adopt solutions capable of guaranteeing the right to sport declared in the Olympic Charter and of doing so in a sustainable way, this responsibility should be assumed at the IOC level by seizing the opportunity of the global dimension that helps reality local to overcome the difficulties.

Finally, I turned to the last and highest level of the organization of the Olympic Movement whose mission is the organization of the OGs, that is, the IOC. After years of lack of sufficient definition of sustainability goals and continuous discussions on the legacy aspects of the OGs (concept introduced in the Olympic Charter in 2004), only more recently, in 2014, and with subsequent and further rapid progress starting in 2017, the two strategies were linked and integrated into the vision of the IOC. The Sustainability and Legacy Commission was born in 2014.

The ambition of the OGs, whose *mega* size clashes with that of the host city, puts a strain on the very concept of sustainability. It is therefore necessary to abandon the logic of urgency, to organize and plan the aspects of sustainability right from the bidding process,

integrating them at every stage of the process. It is a question of defining and implementing a unique project, capable of establishing from its birth the legacy to be left to the city and its inhabitants in social, cultural, economic and environmental aspects. Furthermore, it is necessary to measure the results, with tools that from the environmental point of view are articulated in precise document references, such as the calculation of carbon footprint, the control of energy flows and waste production and treatment. Even the intangible aspects lose some of their elusive nature since the objectives must be declared and this includes their awareness and prior knowledge. Furthermore, the current strategy connects the three spheres of culture, economic and environmental, in a unique and new way, and there is no success on one area if it does not reverberate on the others.

The IOC in its strategy has treasured the teachings and criticisms, detailing the tangible legacy in compliance with the principle of environmental sustainability and allowing the Organization Committee of the Olympic Games (OCOG) to define and carry out specific projects of relevance to the economic and social reality of the city. Considering that the programming of an edition of OGs takes 9 years from the presentation of the offer to the closing ceremony (continuing with a monitoring for another 3 years), the first cycle of verification of the effectiveness of the new strategy will be given by the edition of the winter games of 2026. Meanwhile, the Transfer of Knowledge between the Olympic cities, the production of literature linked to the recovery of the legacy of OGs of the past, the studies entrusted to scientific committees and scholars competent in the various fields, constitute proof of the further efforts of the entire Olympic Movement to support OCOG in understanding the organizational process of OGs and its optimization. This could be a last chance for the Olympic Movement’s credibility and its ability to play its part in the United Nations project summarized in the 2030 Agenda.

In order not to be overwhelmed by the changing society, the Olympic Movement needs to take up the other challenges that are arising, drawing inspiration from the consequences of the pandemic, from the progress of science, from the spread of new ways of expression through the media and remote participation, the frontier of eSports and the growing anthropogenic pressure on the planet. For example, the pandemic crisis has identified some areas of greater resilience, such as non-organized sporting practice, which also offers greater guarantees of sustainability. In order to do this, it will not be enough to have a cue of excellence in Olympic Games is this will not matched by an effective project of education and sustainability of the entire Olympic movement.

7.2 Where action has yet to be taken

Olympic Education:

- increase the opportunities for participation in exploration activities in the natural environment, free from the pressure of competition;
- develop communication programs suitable for each level of competence, specific for the context, sport and for the recipients.

In the practice of sport:

- introducing at all levels the task of monitoring the environmental impact with specific measures and implementing reduction programs with assigned timescales;
- the higher levels of the sports organization should intervene and give their support when there are no resources at the lower levels to take sustainable measures or the needs of the local community imply priorities other than the sustainable practice of sport;
- sports that take place in little anthropized environments should be reconsidered for their potential to further threaten ecosystems and therefore should be banned and alternatively practiced in spaces adjacent to urban ones, limiting the further extension of land surfaces used for the purpose of humankind.

Organization of the Olympic Games:

- the documentation produced by the IOC finally gives a framework of references for the organization of the sustainable Olympic Games but the entire process should be closely monitored to verify its effective implementation.

7.3 Further studies

- Considering that the main impact (about 80%) of sport on the environment is given by the travel of fans, studies should be conducted to evaluate the consequence of alternative forms of participation that can ensure emotional and educational results comparable to those expected from the participation in presence. These would allow in cascade to contain the size of the

infrastructures and to reduce the load on the support chains of all services, including food and waste management.

- develop protocols to be adapted to different situations to measure the environmental impact of each sporting activity.

ADDITIONS AFTER FEBRUARY 2021

This thesis was delivered, as indicated on the cover, in February 2021 but will be discussed in September 2021.

The extraordinary nature of the period marked by the COVID 19 pandemic led to the change of the Master's program with the completion of the thesis before attending the second semester. This also led to the postponement of the OGs which took place from 23 July to 8 August 2021. These situations suggested to me both the opportunity to enhance some notes that I would have studied better if the drafting of this thesis had been subsequent, and to make the first reflections on the sustainability of OGs in Tokyo. This is why I took the liberty of making small changes to the document, confirming that study and history are always a source of new knowledge and that what we write and think changes rapidly over time. Below is a list of the small changes made to the text:

- Added 12 lines at the end of paragraph 3.1.5, page 30, regarding physical education in New Zealand;
- Added 13 lines in paragraph 4.3, page 48, providing an example of rules regarding waste in space;
- Added 5 lines at the end of paragraph 5.5, page 68, regarding leveraging the OGs;
- Added Table 5 – Sustainable Development Goals and Sport, page 143, instead of a previous more concise list;
- Added 5 lines, below Table 6, page 157, regarding types of legacy of OGs;
- Finally, the following short considerations.

At the end of the Tokyo OGs, which took place for the first time during a pandemic, with a one-year delay and without an audience, it is too early to draw conclusions regarding their sustainability. However, there are already some documents that can help to deepen this issue and give the opportunity to make some comments. As has already been argued in paragraph A.2.1, and in other parts of this work, the impact of spectators is a very important part of the overall impact of the event. In the case of Tokyo, the absence of the public has reduced this direct effect on the environment. However, the negative effects on the three dimensions of sustainability may have been increased by the delay of one year, by the actions necessary to contain the pandemic, by the increase in activities and associated expenses, with the probable loss of opportunities for local communities and spectators.

Some aspects related to the 5 main sustainability themes established by TOCOG (2018) can also be mentioned, such as:

- Use of recycled materials, such as plastic podiums recovered from the oceans, cardboard beds, recycled aluminum torches and medals whose material has been recovered from electronic waste and use of wooden structures, uniforms made with recycled material: the fact that some materials continue to be used is not a good sign, while for the use of wood it is necessary to ascertain the origin, excluding that it may cause deforestation; the beds, podiums and mattresses can be transformed again into other products (Prideaux, 2021);
- Renewable energy and energy saving: use of solar, wind and water energy, generated from biomass and waste, use of LED-only lighting systems, electric transport (Prideaux, 2021).

According to Müller et al., (2021), activities aimed at sustainability remain only superficial and are declassified to greenwashing maneuvers. The study group examined the impact of the Olympic Games from 1992 to date, considering Tokyo as the third worst result and highlighting a worsening trend linked to the growth of OGs. These scholars used a comparative tool, based on the three aspects of sustainability (environmental, economic and social) to which they attributed the same weight. The overall average score on a scale of 100 (100 means sustainable) is 48, with Tokyo having an estimated score of around 40. According to the authors, the negative trend is linked to the continued growth of the event and they propose that OGs be hosted from a few cities in rotation, on the basis of already having all the structures and organization, suggest the reduction of spectators by improving the diffusion of digital content and the importance of having a further boost to good governance.

Only a few days after delivering this thesis, precisely on March 10, 2021, during the 137th session of the IOC, in his closing speech, President Bach recalled the commitment to sustainability with the ambition of the IOC to become climate-positive by 2024 with the Olympic Forest project which includes, among other things, the planting of trees in countries such as Senegal and Mali (IOC, 2021). Furthermore, he expressed the goal of organizing the future Olympic Games without the need to build new structures, using only renewable energy for climate-positive OG by 2030.

Considering that in February 2021 it was not possible to establish whether the OGs would take place, their staging marked history and will allow us to verify in the future the legacy effects of this unprecedented situation: in particular due to closed doors they have disappeared approximately ¥ 90bn in revenue for unsold tickets and one million visitors originally expected and not arriving in Japan with a reduction in the boost to the economy of around ¥ 300bn compared to what was planned (Harding, Inagaki, Ahmed, & German, 2021). The protests of a part of the local population who did not want the games to take place for fear of the spread of the virus did not prevent the organizers from defending the project (Takeo & Urabe, 2021), also appealing to the need for the protection of athletes and the desire to start sport again after the pandemic.

Japanese Prime Minister Suga, while declaring the fourth state of emergency for Tokyo since the start of the pandemic, stated:

> (the Olympics will serve as) “*proof that humanity has defeated the coronavirus*” (Alt, 2021)

The time window from February to today therefore confirms the persistence of skepticism on the possibility of having sustainable OGs and a positive legacy also for the local community, in a situation made even more difficult by the pandemic, despite the repetition of promises, from OCOG to OCOG, to organize the most sustainable and best games ever.

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Appendix

This appendix deals with two insights:

- differences between environmental principles and those of Olympism (see A.1);
- a (non-exhaustive) list of sport-related activities whose environmental impact should be limited (see A.2).

A.1 Exploring the principles of environmentalism

Environmentalism and jurisprudence (Pellizzon, 2020) are progressively recognizing that nature is also a subject of law and should be preserved regardless of the purposes of humankind.

While environmentalism and Olympism share similar principles to some extent, it does not mean that they have the same worldview and goals. In particular, while environmentalism refers to humankind more as the subject responsible for the preservation or destruction of the environment, Olympism has its stated goal in FP4: "The goal of Olympism is to place sport at the service of the harmonious development of humankind".

Table 4 lists the environmental principles, juxtaposed with the most pertinent Olympic ones. These principles are briefly described in the following paragraphs.

Table 4 – Comparison between the principles of environmentalism and Olympism

Principle of envinronmentalism		FP of Olympism
A.1.1	Precautionary principle	Harmonious development of humankind, social responsibility, building a better word;
A.1.2	Denial of Cornucopianism	(as the previous) social responsibility
A.1.3	Remote responsibility	Fair play
A.1.4	Intergenerational pact and legacy	Respect and preservation of human dignity; mutual understanding
A.1.5	Common but differentiated responsibilities	Solidarity
A.1.6	Sobriety	Balanced body, will and mind
A.1.7	Equity	Fundamental ethical principle

A.1.1 Precautionary principle

The concept of precaution has long been applied in public health and is generally identified with prevention. Its meaning refers best to the science of risk assessment in cases of no need or safe alternatives to a given action.

The precautionary principle is based on the failure of the principle of evidence. If there is no evidence that something harmful can be ruled out with certainty as a consequence

of an action whose effects we cannot predict, it is assumed that the damage will occur and this requires not taking that action. This constitutes an inversion of a principle of law which normally requires that the burden of proof be borne by those who affirm and not by those who deny (“*onus probandi incumbit ei qui dicit, non ei qui negat*”).

The precautionary principle aims to overcome the immobility caused by the loss of options in making a decision by creating a safety framework capable of stimulating the search for proven interdisciplinary solutions to complex problems. Through awareness and responsibility, it spurs research and implementation of the most appropriate urgent actions.

A.1.2 Denial of Cornucopianism

Cornucopianism is a belief in nature’s infinite abundance and an immeasurable faith in human ingenuity, which is insane and dangerous because mathematics says that in a world with finite resources there is a limit to growth (Worster, 2016) (Kelly, 2019).

> “*Anyone who believes exponential growth can go on forever in a finite world is either a madman or an economist*”
>
> Cit. Kenneth Boulding (Jackson & Victor, 2019, p. 950) (U.S. Congress , 1973, p. 248)

I argue that it is necessary to resize the objectives and take into account the reality of nature and the planet, using resources in balance with their renewal, in compliance with the precautionary principle.

A.1.3 Remote responsibility

The growing connections due to anthropogenic actions such as the transport of raw materials and finished products, migrations, the exploitation of large ecosystems that are related to each other (oceans, atmosphere, rivers), determine effects on a planetary level with repercussions that can be serious and which occur at considerable distances from the places where the causes reside. This introduces remote responsibility, that is a form of responsibility linked to the awareness that even when acting locally, it is necessary to think globally (Watanabe Y. , 2018).

A.1.4 Intergenerational pact and legacy

I have a son named Pietro. Since he was born I have been involved in feeding and dressing him, ensuring him a home and an education and meeting the needs related to his growth. My son is now 17 years old and is gradually becoming aware of his needs and is concerned about meeting them in the future as well. I did not think I was making a deal with my son when I brought him into the world and gave him the opportunity to live. My parents did the same to me. In fact, I grew up in a society that provides care, education, nutrition and which claims to want to support young people. If I think about what I can still do, I would take away the meaning of the efforts made if I could not secure a future for my child.

So I count on being able to leave my son the opportunity to meet his future needs, without compromising the place where I live, impoverishing it. If I pay attention and do what I write, he too may have the opportunity to do the same with the children he will have.

These simple steps show the spontaneity of the birth of the intergenerational pact which, applied to the most crucial resource that is our home, forms the basis of sustainability and environmental conservation. Affirming this principle means choosing to use our time and energy by dividing them between the possibility of satisfying our needs and ensuring the future ones of our children, making us part of a chain that binds us to all our ancestors and our progeny.

A.1.5 Common but differentiated responsibilities

The uneven distribution of resources, the various levels of social, economic and technological development characterize the peoples of the world. In relation to the effective possibilities of access to resources, technology and the current well-being of their people, the environmental legacy of their territories, nations have different capacities to participate in the environmental cause. Richer countries should devote more resources and address the implementation of a larger part of the activities aimed at preserving the planet.

A.1.6 Sobriety

Recognizing real needs and satisfying them with sobriety means giving up the trappings and rejecting greed as it is capable of distorting the appreciation and enjoyment of the opportunities that nature offers. Sobriety requires acting with awareness, controlling the impulses that lead to abuse, offense, appropriation, harm and destruction. Sobriety leads to minimalist choices capable of best preserving the environment and reducing consumption and waste. None should be considered solely as an economic entity whose value is commensurate with its purchasing capacity.

A.1.7 Equity

The main definitions of sustainability derive from an anthropocentric vision of the world and are based on the balanced exploitation of the planet’s resources in order not to impoverish it and not to compromise the same possibility for future human generations. The in-depth study of the complexity of sustainability and a growing sensitivity to the needs of all living species have recognized the need for the protection of all forms of life, introducing the concept of interspecies equity. Interspecies equity is not intended to satisfy the further needs of human beings to administer nature, but enables them to change their perspective and to recognize that many of the rights they claim for themselves are not exclusive to them but belong to all living creatures. The difference between humans and animals and plants lies in the fact that the latter have no tools to defend their rights and enjoy them.

A.2 Issues to consider for the environmental sustainability of sport

Below are the main issues concerning the sustainability of sport and which constitute an in-depth analysis of what is already listed in the Table 1 on page 16.

A.2.1 Air quality

Most of the emissions associated with participation in a sporting event are due to the means of transport used by fans to get to the stadium, estimated at over 80% of the total. To this phenomenon must be added the production of fine dust, with characteristics that are harmful to the human respiratory system and the environment. One of the moments of greatest exposure to atmospheric pollutants is the arrival and departure of fans before and after the event, due to the cars lined up with engines at

idle. But it is above all in tailgating that participants breathe exhaust fumes from engines and cooking systems (barbeques) and are exposed to other pollutants. Environmental measures demonstrated severe participant exposure with lasting effects on the urban context. Thus, while the air quality in the stadium is not a worrying factor, alarming values of air pollutants breathed by the participants are detected in the moments before and after the match and in tailgating.

Responsible concern for environmental

Specific education **i**nitiatives should target fans to raise awareness on responsible transport and the use of active mobility.

Promoting Sustainable Development in Sport

Free parking spaces should be reserved for those who book them with the commitment to arrive early at the event; improve public transport services dedicated to the sporting event; encourage the use of electric vehicles and bicycles and provide surveillance and anti-theft security.

Holding environmentally responsible Olympic Games

The Organizing Committee of the Olympic Games (OCOG) must implement environmental monitoring actions and ensure the conservation or improvement of air quality before, during and after the OGs are held.

A.2.2 Animals and plants (non-human living beings)

The sports world has many points of contact with other living beings who can take part in the competition as non-human athletes or who can be part of it as a context (for example the grass on which a football match is played and the one that constitutes the bottom of a golf course), such as equipment made from animal parts, as food to feed human athletes or spectators, as a mascot. Mascots often evoke the characteristics that athletes would like to possess (strength, aggression, speed, reflexes, endurance, cunning, sympathy, courage) and which constitute the projection of human desire in the anthropocentric vision of other living beings without necessarily worrying about their destiny (Sartore-Baldwin & McCullough, 2017). These uses and symbolisms can reinforce the belief in the power of human beings to create discrimination by

perpetrating abuses on other humans and other forms of life, even these increasingly protected by dedicated laws. The possibility of reconsidering the use of resources as not exclusively of humanity and of recognizing the principle of equity among species can constitute a further opportunity for sport to promote sustainability and justice extended to all living beings.

Responsible concern for environmental

Adequate messages intended for all athletes and spectators could make them aware that with their behavior they can give support to living beings in danger of extinction or subjected to unnecessary suffering.

Promoting Sustainable Development in Sport

IFs and NFs should promote the protection of animals, plants and their habitats through sports facilities and equipment that do not cause them unnecessary suffering and disturbance, as well as safeguarding the quality of water, air and soil.

Holding environmentally responsible Olympic Games

The IOC and OCOG should take into account the impact on non-human living beings in the territory hosting the OGs. The mascots, in addition to being often nice non-human characters, should arouse interest in the protection of the living beings to which they are inspired. Respect for all forms of life should be evident in every Olympic sport. The use of animals in Olympic sports should always be carefully evaluated to investigate under what conditions this participation does not cause them pain.

A.2.3 Calendar of competitions from the grass level

The sporting practice organized since childhood and early youth offers a calendar of competitions with many events, proposing models similar to those of elite athletes. This allows the promotion of sporting activity and increases the opportunity for young people to meet with their peers not only in their neighborhood or city. However, it also constitutes a further reason for frequent and often long journeys whose environmental impact should be considered.

Responsible concern for environmental

Participating in sporting events away from their homes is an attraction for children who are inclined to seek new experiences and aspire to emulate their favorite athletes. Their expectations could be met with a limited number of events and most of the opportunities to compete should be in close proximity. Encouraging the use of means of transport made available by sports clubs could favor socialization and the building of team spirit and would reduce the environmental impact deriving from the use of private cars.

Promoting Sustainable Development in Sport

Race calendars could be further optimized to reduce the impact on the environment by minimizing athletes’ travel. In relation to the levels of practice and the number of participants, engaging sports experiences should be guaranteed through events to be distributed on a territorial basis and a minimum number of major events.

For example, in the NBA championship, given the large distances between the cities of the teams, the number of games and the crowding of the calendar, a team can stay away from its headquarters to play several games in the city of another team. Some tournaments, such as that of the European soccer tournaments, are moving towards the division into groups hosted in different cities or nations, while only the winning teams enter the finals. This makes it possible to reduce the movement of teams and spectators, interventions on sports facilities and transport and to contain the associated costs and organizational problems of a major event played in a single host country. The same approach was used to complete the tournaments during the health emergency linked to COVID-19, obtaining a reduction in travel and simplifying organizational, logistical and health aspects of athletes, staff and the media. Precisely as they are successfully tested in a crisis situation due to the pandemic, these solutions could also be adopted in the future as an alternative to the organization of major events.

Holding environmentally responsible Olympic Games

The sustainability aspects related to the organization of the calendar of events could find difficult application in the context of the Olympic Games, whose program is

finely coordinated to meet many needs. However, the same aspects could be considered to establish competition calendars and qualification criteria which are both the responsibility of the Sports Federations in the Olympic four-year period.

A.2.4 Ceremonies

At the beginning of major sporting events, such as the Olympic Games, as well as at their conclusion, it is traditional to hold a ceremony. The ceremonies have a great celebratory significance of the event itself, of social, cultural and sporting messages with strong references to the host place. Large resources of energy and materials are generally used and should therefore be organized and implemented responsibly. Being an opportunity to send positive environmental messages, they should themselves be an example of sustainability.

Responsible concern for environmental

The organizers of sporting events should be informed that ceremonies can also have an environmental impact.

Promoting Sustainable Development in Sport

In organizing ceremonies, sobriety and the need for them to be held responsible for the environment should be considered.

Holding environmentally responsible Olympic Games

Olympic Games ceremonies should be held in an environmentally responsible manner and themselves be a vehicle for conveying messages related to sustainability.

A.2.5 Cities (sustainable cities)

Given the already mentioned beneficial effects of the relationship with the intact environment, it should be introduced and kept alive, guaranteeing in every place both the possibility of practicing sports in nature at an early age and unstructured physical exercise in all other age groups.

Many small inhabited centers and some large cities in which natural spaces or little affected by human intervention have been preserved, offer their citizens the

opportunity to practice outdoor sports without the need for long journeys from their homes. On the contrary, in relation to the places where they live and their study and work commitments, many people do not have the same opportunities.

Sports federations deal with organized sport by facilitating the achievement of the recommended physical activity level for health and by providing opportunities for socialization, cooperation and friendship. Participation in organized activities may result in practitioners subsequently choosing to exercise independently. Similarly, those who start by practicing autonomous activity are more likely to approach organized sport. Sports practice carried out independently, individually or among a few friends, presents flexibility of place, time, duration, frequency and does not impose competitiveness, without however compromising it. It differs from the organized practice which is carried out in larger groups at gyms and sports clubs. The latter are more traditionally engaged with early childhood, youth and professional sport. Those who practice independent sporting activities optimize the time available by going for a run or doing exercises at home or in the vicinity where public open spaces are available (Book, 2012) (Malchrowicz-Mośko, Rozmiarek, & Poczta, 2021).

Responsible concern for environmental

Although the sports government has competence only for activities that fall within the scope of sports federations, it could exert more pressure through the influence that people who have had positive sports experiences in nature can have on local authorities to meet the growing demand and awareness of the importance of conservation and usability of public green parks.

Promoting Sustainable Development in Sport

Walking or cycling to arrive in a green park or in natural places integrated in the cities to practice outdoor sports saves free time that would otherwise be required by long journeys and reduces the use of vehicles with environmental impact.

Sports federations, acting in the social, economic and political organization, can promote the availability of free spaces for independent[13] physical activity,

[13] "independent" i.e. "unstructured", "unorganized". Therefore I refer to activities carried out individually, spontaneously and autonomously. The phenomenon is widespread and significant in terms of physical exercise of the general population.

expanding the opportunities to bring people closer to sport and free play which positively correlates with the quality of life in all age groups (Mahdjoub & Spencer, 2015).

The level of physical activity decreases in the city due to the use of passive transport but can increase in the presence of suitable spaces for physical exercise that are easily accessible. The development of cities is in the balance between forcing people into an excessively confined, noisy and overbuilding space, or offering places for recreation and aggregation such as parks, allowing the use of better means of transport and providing innovative services (Boyko & Cooper, 2013). This requires that people feel comfortable staying for a long time, peacefully and safely in places reachable with active mobility (i.e. on foot or by bicycle) as they are close to where they live (Medeiros, Carvalho, Jéssica, & Penha, 2019). In these conditions, the parks spontaneously fill up with people dedicated to movement who, with their visible presence, encourage other citizens to adopt sustainable behavior and to recognize the importance and care of the places where they spend their free time. Also, by improving their fitness, it is easier for people to choose to actively move around the city. The proximity to homes facilitates those who have limited autonomy as they do not have a car or driving license, including children and the elderly. This indicates that a well-organized and sustainable city can better ensure fair opportunities for social interaction. However, those involved in sports should be able to evaluate the different perception of needs linked to wealth and age. These are the aspects that condition people’s decision to go to parks and public spaces and can facilitate those who are already economically and physically healthy and increase social distances (Book, 2020).

Holding environmentally responsible Olympic Games

Safeguarding the environmental integrity in the cities hosting the Olympic Games is one of the IOC’s ambitions which requires concrete commitments that will also be examined below.

A.2.6 Clothing (training clothing)

The use of technical clothing and training footwear is another element to consider and athletes should take care of it, possibly reuse it (and not throw it away after a sole use)

and make sure it comes from sustainable supply chains. The availability of technical material offered by sponsors can lead to underestimating the importance of the value of these products.

Responsible concern for environmental

The production of clothing also involves the use of materials and energy, often from non-renewable sources. For responsible purchase and use, information on the production system and useful life cycle of sports clothing should be provided.

Promoting Sustainable Development in Sport

Federations and individual athletes can choose to use responsibly produced material and optimize the cycle of use. Generally, the sports clubs' promotion strategy consists in withdrawing the clothing relating to the previous season and carrying out continuous restyling. In making these decisions, the procurement process should be revisited, waste generation assessed and the unnecessary impulse to consumerism avoided.

Holding environmentally responsible Olympic Games

Sportswear partners of the Olympic games should be required to responsibly produce and reuse the material. Furthermore, used clothing should be reintroduced into availability for use and discarded only when it no longer fulfills its function.

A.2.7 Equipments (sport equipments)

The growing possibility of producing low-cost sports equipment makes their purchase accessible to millions of people who can experiment with different activities. However, a low-cost approach often encourages purchases that prove to be of little use and constitute a whim for the occasional or even exceptional practice of a sport. The production of this equipment requires the use of unnecessary resources and generates an increase in waste.

Responsible concern for environmental

The sustainability of all products is essential for assessing the environmental impact. For this it is necessary to disclose the production processes of sporting

goods and how these could be improved; it is necessary to make known green solutions, to insist on the need to use renewable resources and to contain the volume of waste. The life and use cycle on the basis of which the environmental impact assessment is carried out should also be indicated. This information would facilitate responsible purchasing decisions and broaden the evaluation parameters otherwise limited to short-term economic convenience.

Promoting Sustainable Development in Sport

People attracted to the opportunity to try out fun disciplines should have the opportunity to use the equipment initially made available by sports clubs, before deciding on any purchases.

The products used by athletes and in the activities of sports federations should meet the requirements of sustainability, re-usability and adequate life cycle.

Holding environmentally responsible Olympic Games

Equipment used in OGs should be selected in relation to their environmental sustainability and manufacturers’ commitment not to market cheap product lines that do not meet the same requirements.

A.2.8 Facilities (sport facilities)

Sport facilities have the potential to generate a great environmental impact for their construction, use and demolition at the end of their life. This topic is dealt with in chapter 4.3.

Responsible concern for environmental

The use of environmentally friendly and functional facilities is an excellent example for all those who attend them, as athletes, technicians or spectators and guides them to responsible behavior.

Promoting Sustainable Development in Sport

IFs and NFs can encourage the green transition of sport facilities with specific regulations and certifications.

Holding environmentally responsible Olympic Games

The facilities that host the Olympic Games should be a shining example of functionality and sustainability and not turn into white elephants.

A.2.9 Gadgets

Sports fans are fond of the colors of their favorite sports club or athlete and directly produce, buy and wear materials and accessories, including make-up, with which they express a spirit of belonging and support. The gadgets market is responsible for an enormous use of resources and its environmental impact needs to be evaluated.

Responsible concern for environmental

These should be reused as often as they perform a function of their own, such as a shirt used for dressing. For products that are of no use, it is necessary to consider how they are made and how they should be disposed of to limit their environmental impact and in any case favor useful alternatives.

Promoting Sustainable Development in Sport

The transfer of the rights to the symbols and colors of sports clubs should take into account the consequences of their trade if this is based not on the usefulness of the products but on the display by those who buy them. Sports clubs that use a large number of variations to their match kits should take into account the responsibility and environmental impact of a market based on appearances into which they could draw their fans.

Furthermore, all athletes should make use of useful and adequate products and take care of them to ensure that they have a desirable and sustainable life cycle and by being an example, avoiding deliberate damage in moments of sporting frustration.

Holding environmentally responsible Olympic Games

All products authorized to display the symbols of the Olympics should have spread the spirit and values of OM and therefore also be respectful of environmental sustainability. The IOC should only authorize useful, responsibly manufactured,

durable and reusable products, capable of ensuring a balance between the resources used and their effectiveness.

A.2.10 Gyms and fitness centers

Millions of people go to gyms and fitness centers. Especially in large cities, structures have been created that offer a remarkable package of services and the possibility of attending physical activity courses that are attractive for novelty and differentiation. In these structures there are often very sophisticated systems and equipment that reproduce motor gestures under controlled conditions and that require energy. For example, a treadmill can consume around 700 watts / hour, which is even higher than the biological power of most users. Therefore, in addition to the energy consumption of the practitioner, there is a power consumption of the device used for training. Furthermore, these sports centers require the use of parking areas and other services provided to their customers, with the potential to increase the anthropogenic impact on the city environment and facilitate the further movement of people by private means. The physical exercise that takes place here replaces much of the motor activity that could be done profitably during normal daily life. For example, when people shop by bike or on foot, they buy what they need to live and at the same time maintain an active lifestyle. Instead, people tend to carry out useful activities that are perceived as routine by mechanical means while waiting for free time to exercise in gyms. The net balance is of a greater overall energy consumption and a growing environmental impact: means of transport are used more (in addition to trips to go to the gym) and training tools that require additional power.

Responsible concern for environmental

The equipment and all the places where exercise and sport are practiced contribute to achieving the benefits of an active lifestyle, but together they have the potential to generate harmful effects on the environment. For this reason, users should be aware that they can ask for information on how the services they use meet this need and how to do it better to contain or eliminate their own impact**.**

Promoting Sustainable Development in Sport

Sports associations should inform their athletes that it is desirable that they go to practice places with soft mobility whenever possible and ask them to be responsible

for the use of water, energy, equipment and all services made available after a careful environmental impact assessment process.

Holding environmentally responsible Olympic Games

This argument does not fall directly within the scope of action of the IOC and OCOG. In facilities used for training athletes during OGs, equipment suitable for training athletes and also environmentally friendly should be used. This could facilitate the adoption of good practices by athletes who can spread them when they return home.

A.2.11 Health services

Access to health services and recovery from illness and injury is a right of all people. Athletes, although it is often argued that sport meets health better, generally require specific care as they suffer injuries; moreover, in conditions of particular stress, their immune systems can be weakened with consequent intestinal infections and mycosis. In addition, in some cases they suffer from sleep disorders and migraines, related to stress and jet lag. Training and injury prevention and health protection techniques characterize the activity of most athletes. However, compared to their peers, they resort much more often to medical, physiotherapy and pharmacological therapies that consume generally non-renewable resources. While it does not compete with public health systems, the environmental impact of health care for athletes should be taken into account.

Responsible concern for environmental

The protection of health and the prevention of any disorder allows a reduction in the use of therapies and medical treatments, which involve considerable resources. The adequate level of sports practice correlates with health and sustainability for the health system, without subtracting resources from other needs. Educational campaigns should aim to recognize that the challenge of athletes is to not cause unnecessary harm and never underestimate the health consequences of what they do, without irresponsibly challenging physiological capabilities. The prospects for using treatments to restore the athlete’s health and integrity should also take into account the impact on resource use.

Promoting Sustainable Development in Sport

Although for many years all sports federations have been committed to reducing the health risks deriving from sporting practice, the number and type of injuries is always remarkably high, up to 1000 times greater than in the work activities of countries that provide for protection of workers. In addition to implementing adequate training measures for all age groups, it should be considered that the use of therapies should be considered a necessity and that the medicalization of athletes in order to improve their performance is not compatible with either the harmonious development of the person or with the sustainability of unnecessary services that are implemented for this purpose.

Holding environmentally responsible Olympic Games

Sports which cause a considerable number of injuries or which can compromise the safety and health of athletes in the long term should be regarded with suspicion. Olympic sport should be an example of respect for health as a means of reducing unnecessary recourse to medical treatment. Olympism’s effort should be directed at reducing medical care to reserve it for other needs of human beings.

A.2.12 Levels of Physical Activity and training volume

The World Health Organization (2020) have defined levels of physical activity that correlate with the best effects on health and with sustainability. Strenuous practice of a sport exceeds these levels and is associated with injuries, greater consumption of equipment and food, the need for travel, the use of training and recovery technologies and tools and health-related services that are generally not necessary for individuals of the same age who are in good health and practicing the suggested level of physical activity.

The suggested level of health is adequate for relationship life but would not allow for the best sports performance. Even if performance does not depend only on the volume of training, this is still a fundamental parameter to improve it and to be able to challenge other athletes who train hard. Therefore, training for sports practice, especially for elevated levels of competition, should also be evaluated in terms of environmental impact.

Responsible concern for environmental

Since the introduction of the first forms of play and then of training, children realize that greater application can lead to better performance. It stimulates challenging work and shapes their character, preparing them for other commitments of social importance. Specific training forms could stimulate practitioners to produce the best result in conditions where exercise time is regulated. In American colleges there are already criteria that limit the hours of weekly training. These criteria, in addition to leaving time and energy for other activities, can stimulate the improvement of the quality of training over quantity and transfer the concept of sustainability of sports practice in harmony with the other commitments of one's life. Having limited resources and time with respect to their total availability, children will have to optimize the use of those assigned to them, using an ecological approach.

Promoting Sustainable Development in Sport

It is possible to inform and make athletes aware of the impact that training techniques and injuries can have on their health and the environment. However, it is difficult to introduce regulations, especially in individual sports, to limit the hours and number of training sessions. Furthermore, in the absence of adequate evaluation and control methods, unfairness would be introduced.

Holding environmentally responsible Olympic Games

This point is related to the sustainability of the sport itself. Restrictions on training would require redefining performance disciplines in order to also consider negative effects on the environment. Up to now Olympism has never set limits to training except to guarantee the protection of young athletes.

A.2.13 Media (sport media)

At all levels of the competition, sports news is of interest not only to participating athletes, but also to technicians, sports managers, family members and a huge number of fans. A considerable amount of information concerns the calendars, the results, the rankings, the story of sports gestures in measurable terms and many comments and opinions also relating to the forecast of future results. In order to spread this sports news through the media, considerable resources are used in terms of people and means

to be taken into consideration for their environmental impact. Moreover, for the enjoyment of sporting events, the fans buy magazines and newspapers and spend a lot of time on TV, radio and streaming. Added to this is the intensive use of social networks with which images and comments on sporting moments are shared millions of times. Most of these activities, although they are of great interest to fans and technicians, do not directly contribute to the effectiveness of the sport in its mission.

Responsible concern for environmental

Only some official media channels are managed by the IOC and can contribute to the purpose of Olympism both directly, with the introduction of sustainable production processes, and indirectly. The awareness of a vast number of users can grow with the good example of the media and their action in openly addressing environmental issues with dedicated messages.

Promoting Sustainable Development in Sport

The sport that is exasperated or exclusively concerned with performance answers the question “What result did you have?” and hardly meets the sustainability requirements that are more consistent with the questions: “Did you have fun? Were you okay? Did you work hard?” What sportspeople are talking about is what will be addressed in sports communication. The communication strategy of the IFs and NFs should be oriented towards these objectives.

Holding environmentally responsible Olympic Games

Attending events as an audience could be revisited given the new possibilities provided by the media. Modern technologies have the potential to enhance the remote viewer experience, while physical participation may be predominantly local. This would minimize spectator travel and increase the willingness of cities to host events because their citizens could enjoy them without some of the side effects of a huge crowd.

A.2.14 Nature (sport in nature)

Numerous studies have highlighted the correlation between a positive contact with nature when young (but also in other age groups) and the strengthening of awareness

of its importance. Pedagogy and educational sciences identify contact with the natural environment as the premise for physical and cognitive development (Jickling & Wals, 2008).

Olympic sport, by definition, requires competition between athletes under standardized conditions to allow everyone an equal chance of success. The natural environment does not guarantee this condition. One moment and place can be quite different from the other: wind, rain, brightness, slope, wave height, surface conditions and other factors affect the reproducibility of conditions and the performance comparison. Furthermore, activities practiced in opposition to the forces of nature (e.g. mountaineering) have been subject to exclusion as the human element of a competitor is missing. The control of competition conditions by creating a standardized environment, undermines sporting practice in close contact with nature and promotes the concept of acting on nature to remove obstacles to the possibility of making evident the exquisitely human aspect of sport.

Among the factors that are determining the detachment of many young people from traditional sports is the search for new experiences in nature. To ensure sustainability, responsible travel to practice sites, their conservation and the use of green equipment are required.

By progressively introducing new sports disciplines into the Olympic program, the IOC takes its cue from the spontaneous evolution of practice among young people. The IOC should preserve the characteristics that have made these disciplines attractive and should ensure a minimal approach, with regulations capable of preserving the peculiarities and emerging needs among practitioners.

Of course, there are many disciplines for which environmental elements can determine performance (e.g. sailing). In the k1 slalom kayak, in the skeleton and bobsleigh, in ski jumping, sports facilities have already been built to artificially create the conditions suitable for standardized competition. This approach could extend to a growing number of disciplines with the increase of indoor facilities for skiing, wave generators for surfing, climbing walls and other facilities, whose diffusion pursues recreational purposes in large cities and where the practice of those disciplines would not be possible. The safety aspects, the possibility of guaranteeing the conduct of the practice and the competitions contribute to these choices. On the contrary, at the moment, in

the program of the Paris 2024 Olympic Games, surfing competitions will only be held if the sea and wind conditions are suitable.

A further reflection is given by the traditional connection of sport with the characteristic of the territory. The nature of the places has determined the possibility of practicing specific sports and not others. This is particularly true for sports that require a specific natural environment such as the mountains or the sea. Among the effects of globalization, there has been the spread of sports and the search for solutions to overcome the environmental obstacles to practice. This does not differentiate sport from other human activities and confirms the tendency of human beings to use their wits to achieve their goals. Recognizing the possibility of practicing any sport in the place where one lives or being able to go to places where it is possible to practice it, could conflict with environmental sustainability criteria and should be carefully evaluated.

To take this issue to the extreme, before playing golf (Vare & Scott, 2007), swimming or ice hockey, in a desert area or playing beach volleyball in the high mountains, we should be able to prove that it can be green. It should also be considered the possibility of adopting forms of training, whatever the conditions required in the competition, more able to reconcile with the nature of the place. It is necessary to take advantage of the opportunities offered by technology, for example by verifying whether skiing, ski jumping or climbing in an artificial facility can guarantee better practice and at the same time better preserve the environment, compared to practicing in a natural context and questioning the practice of some sports in relation to places. The combination of these goals is what we should aim for.

Responsible concern for environmental

A program of experience in nature should be included in all sports at an early age. Through fun sporting activities in nature, adults also develop awareness of environmental issues.

Promoting Sustainable Development in Sport

Sports activities that take place in nature can be challenging, sustainable and consistent with the declared purpose of enjoying nature while preserving its integrity, its resources and forms of life. The suspension or cancellation of sports

activities in nature when they do not meet these requirements, together with regulations capable of comparing the performance of athletes in different competition conditions, could preserve not only the sustainability and spontaneity of the natural experience but also the unrepeatability rather than the standardization of the races.

Holding environmentally responsible Olympic Games

The introduction of sport in nature into the OG program facilitates the spreading of awareness for environmental issues. Furthermore, it is itself an element in support of the sustainability of the OG as a characteristic of these disciplines.

A.2.15 Nutrition (sport nutrition)

Professionals and elite athletes may need a specific diet, both for the high energy expenditure and to satisfy any deficiencies in trace elements with a need for nutritional supplementation. Furthermore, especially during training and competition, athletes frequently use ready-made foods enriched with particular nutrients to better cope with the effort. New foods for athletes are continuously being produced. However, these foods are generally not necessary. The guidelines of the national institutes favor a healthy and varied diet, with diet models that meet the diverse cultural and personal needs of athletes. The consumption of products in the correct quality and quantity, the elimination of abuse and unnecessary products, contribute to the sustainability of the athlete’s diet. Many supplement products and specific processed foods have a considerable impact on the environment and compete for the same resources required for the food security of all peoples (see SDG.2). Science has shown that it is possible, even for athletes, to adopt a diet that reconciles with the pursuit of performance and sustainability. Athletes should reconsider their eating habits and see if they have an environmental impact that they can eliminate.

Also fans who follow their favorite athletes need to eat and drink when traveling and where competitions are held. In this context, the atmosphere of fun, sociability, being away from home, any situations of tiredness or discomfort and personal habits can lead to a reduction in the capacity to respond appropriately to stimuli of an emotional, affective, olfactory, visual nature. and economic that result in inappropriate food choices. In many cases, for reasons of the safety of sports facilities, it is not possible to

enter with food and drink containers. Generally there are operators with exclusive right of sale, obtained through commercial agreements with the manager. These sellers for economic and financial reasons enter into agreements for the procurement and distribution of sponsored products. Therefore the fans, who in this context may have a strong incentive to buy, can access a choice limited to products sold within the sports facility.

Responsible concern for environmental

Specific awareness campaigns on the importance of sustainable nutrition should be carried out at all levels. In fact, the food supply chain alone is responsible for most of the anthropogenic impact on the environment. Essential information should be provided on the principles of sustainability applied to food to allow everyone to make responsible choices that are also compatible with each person’s culture and tradition.

Promoting Sustainable Development in Sport

Federations, sports clubs and athletes should refer to sustainable diets and avoid unnecessary use of products that do not meet this requirement and that can be replaced with others of lesser impact. In nutrition for training and competition, as well as for spectators, it is necessary to recognize the cultural, social, economic and environmental value of food and avoid any form of waste.

The plant manager, in the stipulation of food marketing agreements should indicate requirements for the packaging (which affects the type and quantity of waste), for the type and quality of products and their nutrients, for the supply chain. In this way it would be easier to reconcile the purchases of the fans with the need to feed themselves, to preserve health, to have quality and nutritious products at the right cost (which affects the participation budget) and to respect sustainable production and consumption criteria. Game breaks, the condition of being seated, the typical rituals of these events, can lead fans to consume food and drink even without being hungry and thirsty. Generally there are no public water fountains available and to drink sugary products are often bought together with unhealthy food. Convenience reasons end up favoring foods such as hot dogs over vegetables that are hardly available. The possibility that operators pass in front of the spectators with drinks,

ice cream and sandwiches makes these products easily accessible and increases the purchase and consumption. The possibility of acting on the theme of the nutrition of people entering a stadium should take into account many of these factors. Convincing a very large number of people of the opportunity of a healthy and sustainable diet would be extremely difficult while it would be easier to involve sellers in marketing and distribution programs of products that have the desirable requirements and capable of determining a guided change in consumer habits. There is evidence that the action of the actors at the meso level of decision-making processes is capable of influencing individuals, particularly in nutrition (Layton, 2008).

Leftover food can be used for the local community through the support of organizations that help those in need.

Holding environmentally responsible Olympic Games

Nutrition in the Olympic village should always be attentive to sustainability and ensure that food is not wasted. Non-compliance with this criterion should be a reason for exclusion from OM partners.

A.2.16 Personal care

Athletes, in relation to frequent physical exercise, have greater personal care needs. Therefore they consume copious quantities of water, detergents, deodorant and other products. The consumption of water is an aspect that impacts sustainability and so do personal care products. The need to wash the outfits used in training also impacts the environment. Athletes should pay attention to the consumption of these resources, including product packaging, and make sure they avoid any waste and use products from responsible supply chains. This area also includes personal specific hygiene practices (hair treatments, tattoos, nail care, ointments) with the potential to generate an unjustified environmental impact.

Responsible concern for environmental

Even the most personal aspects such as hygiene require particular attention to sustainability. The greater the need to resort to personal hygiene practices, the greater the environmental impact and the more attention will be needed to limit it.

Information on correct hygiene should complement communications to athletes and should contain useful information for responsible choices. Some examples are: avoiding waste of water and soaps; whenever possible use clothes and towels a couple of times before washing them.

Promoting Sustainable Development in Sport

Athletes and sports clubs should monitor their water consumption, establish reference values to be respected based on the number of training sessions and athletes, use sustainable detergents for personal care and for washing clothes and towels.

Holding environmentally responsible Olympic Games

The Olympic village should be built to reduce waste in the area of hygiene and care of people and partners with responsible supply chains should be selected.

A.2.17 Prizes (medals, cups, trophies)

The prizes to the winners can consist of medals, cups, trophies, money and in many competitions there are other products offered by sponsors. The prizes are an integral part of the memory and identity of the athletes who jealously preserve them. They take on a symbolic meaning and we all have in mind the moment when an athlete has raised a cup to the sky or bitten a medal. In some cases the prizes are collected in exhibitions and museums, especially in team sports. The production chain involves many workers and artists. Prizes, like all artifacts, can have an environmental impact and the production chain should be responsible.

Responsible concern for environmental

Athletes and all practitioners should be made aware of the symbolic value of medals and cups and that they should be sustainable.

Promoting Sustainable Development in Sport

The federations and all those involved in organizing the competitions should reward the winners with cups and medals made in a responsible and sustainable way, with

low or no environmental impact materials and trophies to pass from hand to hand to the winners.

Holding environmentally responsible Olympic Games

The Tokyo OCOG decided to produce the medals by recovering heavy metals from electronic waste with the aim of allowing their reuse and having a positive environmental impact, preventing them from becoming pollutants. This or equivalent decisions should be made from now on.

A.2.18 Rules of the game

The rules of the game should always take into consideration respect for the environment and the possibility of using materials for the construction of renewable or low environmental impact equipment. The same applies to the field and the criteria for their eligibility to compete, which must in any case comply with adequate safety standards.

Responsible concern for environmental

The practice of a sport that has rules that are also effective for the environment could in itself constitute a form of education in sustainability.

Promoting Sustainable Development in Sport

The decision on the rules of the game is the responsibility of the federations. Compromises should be found to preserve the characteristics of a game and possibly introduce progressive changes that allow an ecological transition. Too restrictive rules regarding the playing surface can result in excessive use of energy and water to cultivate the lawn while establishing that it is made up of a native lawn would preserve biodiversity. The regulations could deal with many aspects such as the use of specific equipment, the maximum frequency of replacement, the maximum size of the facilities for competitions and training.

Holding environmentally responsible Olympic Games

The rules on the number of participants, composition of teams, number of disciplines, composition of staff, sharing of health personnel and means of

assistance can further influence the direction of the sustainability of the Olympic Games.

A.2.19 SDGs (sport and SDGs)

The Sustainable Development Goals are strategic goals defined by the United Nations in order to achieve social, economic and environmental development capable of ensuring a better future for all. The SDGs have specific indicators which should be investigated and which serve to establish the progress made and the level of adequacy of the results. Here I will limit myself to indicating the contribution that I believe sport can make to the achievement of each SDGs in three levels:

1. The contribution of sport can be very little or no;
2. Sport can make a contribuition;
3. Sport can make a strong contribuition.

I will present my point of view in the form of a table, in order to give a general and synthetic look.

Table 5 – Sustainable Development Goals and Sport[14]

ID	ISSUE	Contribute of sport			How SPORT should help to achieve the SDG
SDG.1	End poverty in all its forms everywhere;	1			Little contribution
SDG.2	End hunger, achieve food security and improved nutrition and promote sustainable agriculture;		2		Nutrition is a very important aspect of those who practice sports and sports organizations can do a lot to promote a healthy and sustainable diet. More difficult to intervene, if not with other programs, in countries where hunger is a widespread phenomenon. There, we need partnerships and strong action by governments. In any case, as emerges from other SDGs, sport can exert pressure and orient the international community.
SDG.3	Ensure healthy lives and promote well-being for all at all ages;			3	There are numerous studies that correlate physical and psychological health with an appropriate level of exercise.
SDG.4	Ensure inclusive and equitable education and promote lifelong learning opportunities for all;			3	The education of future citizens requires an awareness of values that Olympic education considers essential and which should be communicated together with the practice of sport. This is also stated in the Olympic Charter.
SDG.5	Achieve gender equality and empower all women and girls;			3	The organization of sporting events, such as relay races with athletes of both genders, is a strong tool for promoting gender equality.
SDG.6	Ensure availability and sustainable management of water and sanitation for all;		2		The use of water resources is closely related to many products and facilities: sports organizations need to use them responsibly.

[14] This table was sent by the author of this thesis to Professor Dimitris Gargalianos who used it in the powerpoint presentations of module "O1. Olympic Movement and International relations" in the 2021 academic year.

ID	ISSUE	Contribute of sport			How SPORT should help to achieve the SDG
SDG.7	Ensure access to affordable, reliable, sustainable and modern energy for all;	1			The practice of sport is associated with a high consumption of raw materials and energy and the use of renewable energy sources and materials with low environmental impact should always be pursued.
SDG.8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all;	1			The same considerations can be made regarding SDG.1
SDG.9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation;		2		Sport can contribute to the development of technologies that can have beneficial effects on other fields (e.g. sustainable facilities, tools for disabled athletes, production of equipment such as shoes and clothing in a sustainable way).
SDG.10	Reduce inequality within and among countries;	1			The same considerations should be made regarding SDG.1.
SDG.11	Make cities and human settlements inclusive, safe, resilient and sustainable;		2		The sport-city, a city built for an active and responsible lifestyle, where people make a limited use of unnecessary energy and products, is a very promising prospect.
SDG.12	Ensure sustainable consumption and production patterns;		2		As with the other SDGs concerning access to raw materials and energy, it should be remembered that sport consumes both these resources a lot and should take care of doing it in a responsible way.
SDG.13	Take urgent action to combat climate change and its impacts;		2		Climate change depends on the use of non-renewable energy and raw materials and to an excessive extent. The same applies to other SDGs (for example SDG.12).

ID	ISSUE	Contribute of sport			How SPORT should help to achieve the SDG
SDG.14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development;				The practice of sport can affect all ecosystems as a place of practice or as there are environmental repercussions for pollutants or consumption of raw materials, including a diet that is not respectful of the environment.
SDG.15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss;		2		The same considerations of the previous SDG.14. The nutrition of those who practice sports, equipment and energy (including that of the movement of spectators) correspond to a very high share of the total energy and consumption of the planet. Therefore sport is responsible for making its own contribution and possibly influencing production systems that are not committed to the environment.
SDG.16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels;		2		Sport can achieve these goals above all by the strength of example and education (SDG.4) and also by acting at an international level through the condemnation of countries where discrimination exists. See also SDG.17
SDG.17	Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development.		2		The IOC has a partnership with the United Nations and this makes it a soft tool for achieving sustainable development and peace.

Addressing how sport can make its contribution to each of the Sustainable Development Goals is not the ambition of this work. Here it is sufficient to list them to give an idea of the links with the activities of the OM. Precisely because they are closely related to OGs, many aspects are still dealt with in chapter 5.2 and 5.4.

The IOC Sustainability Strategy (IOC, 2017b) is the document that indicates the IOC's ambitions to contribute to sustainable goals. The main recommendations concern the active leadership role of the IOC in order to verify that each level of programming and each activity natively integrate the relevant economic, social and environmental aspects. Furthermore, it is proposed to monitor the organization of OGs and their legacy, in close contact with the World Union of Olympic Cities (WUOC).

The involvement of the OM progressively extends from a small number of SDGs (i.e. SDG.3, SDG.4, SDG.5, SDG.11, SDG.16, SDG.17) indicated in 2016 by the United Nations (Lemke, 2016) up to almost all the SDGs (SDGF, 2018), precisely for the interactions of sport in all areas of development.

A.2.20 Spectators

Sporting events such as football matches also take place in the presence of 80,000 spectators against an extremely limited number of athletes (in this case 22 players on the pitch plus reserves). Spectators not only move from their homes to reach the event venues, but they increase their consumption, produce more waste than staying at home and use infrastructures such as roads, railways, sports facilities, health centers, hotels and restaurants which should be adequately sized to ensure the necessary logistical support and public safety.

Responsible concern for environmental

Suitable communication campaigns should guide spectators to choices of responsible behavior regarding their movements, their presence in the competition venues and the consumption of resources.

Promoting Sustainable Development in Sport

The virtuous behavior of athletes and sports clubs in their movements, consumption, waste production, use and respect for materials and places, is the basis of the influence they can exert on spectators with regard to environmental issues.

Holding environmentally responsible Olympic Games

The involvement in the organization of the logistical aspects related to the spectators, the way in which they arrive at the competition venues and the services made available and their ability to be based on sustainability is the prerequisite for the organization of events consistent with this need. This requirement is imposed by the IOC on the bidding cities and requires to be verified for compliance with its objective.

A.2.21 Tailgating (and other activities that take place at sporting events)

A further opportunity for fans attending an event to get together is given by tailgating. Around temporary structures organized with parking spaces for cars it is possible to eat, buy products with team logos, listen to music, celebrate. So many fans and other people gather. Participation is usually facilitated for those who travel with their own car. Tailgating adds meaning to the event (belonging, sociability, nostalgia and support).

The paradox is that tailgating is considered low-cost and has a high effect on participation without taking into account the serious environmental impacts generated: excessive noise and light, release of biological and chemical pollutants in the land, destruction of vegetation, emission of gas greenhouse effect through cars and portable generators, use of food from unsustainable supply chains, chemical toilets, use of disposable materials, significant production of waste, water and soil pollution, soil consumption. For each of these aspects, the organization of the event, the local authorities and the participants should take measures to reduce the impact such as: balanced use of spaces compared to free spaces; study of accesses and routes to facilitate carpool, electric vehicles and bicycles; use of ecological chemical toilets; planting where areas of vegetation have been compromised; reduction of noise and light emissions, limitation to the use of portable generators; use of sustainable products, waste separation and containment of production. From a form of tribal aggregation with irresponsible traits, through environmental impact mitigation measures, it is possible to raise the quality of these events with the potential to constitute an opportunity for positive socializing (Xue, Gao, & Kerstetter, 2018).

Responsible concern for environmental

Socialization activities are important for participation in sport, therefore information campaigns should be particularly careful in suggesting the best behaviors aimed at avoiding an unwanted environmental impact.

Promoting Sustainable Development in Sport

The IFs and NFs should manage or have close collaboration with those who organize entertainment events for spectators and the local population at sports competitions, so that no damage is caused to places, people and other living beings.

Holding environmentally responsible Olympic Games

The IOC and OCOG should interact with all efforts with local authorities and all stakeholders involved in exhibitions, sales and shows and socialization events during OGs to manage and reduce possible environmental impacts.

A.2.22 Technology (in sport)

The use of increasing technology in sport has the potential for environmental impact. In fact, the effort for continuous innovation requires energy resources and determines that the products used in the past are no longer competitive for sports. For example, today it would be unthinkable to participate in a tennis tournament like Wimbledon with a 1950’s wooden racket. The speed of innovation is responsible for a greater consumption of sports equipment and reduces their life cycle. This aspect does not only concern professional and elite sport but much more the amateurs who constitute a huge base of practitioners, often willing to spend large sums to have the latest model of bicycle, tennis racket or skis. Of course, technology, like other aspects discussed above, also has enormous potential to solve problems and for example produce new products in a sustainable way. Therefore all this should be taken into consideration and associated with the use for its entire useful life cycle of each equipment, avoiding premature replacement. Furthermore, the technology can affect a growing number of devices that can actually facilitate sports practice but whose need could be questioned. Very often, sensors and training technologies go beyond what is useful for controlling the physical exercise of millions of practitioners. Therefore technology constitutes an attraction with the potential to bring many people closer to an active lifestyle or to sport, but at the same time it is responsible for a growing quantity of products and services that have an environmental impact. Often they do not improve sports practice and sometimes exceed the real opportunity to monitor parameters that fall within the sphere of health.

Responsible concern for environmental

The growing availability of innovative products requires people to be informed about their actual usefulness and about existing alternatives in order to make responsible choices.

Furthermore, they should be informed that the possibility of simplifying the athlete's task to improve their external performance does not necessarily correspond to the balanced development of the person and the possibility of containing the environmental impact of the practice.

Promoting Sustainable Development in Sport

IFs and NFs should evaluate the introduction of innovations in the regulations of the Olympic disciplines in order to remove obstacles to the affirmation of the human aspect of sport and facilitate the dissemination of the practice to the largest number of people in a sustainable way.

Holding environmentally responsible Olympic Games

The IOC should encourage technology or refuse its indiscriminate introduction into sport but always with the same purpose: to stimulate the search for better and more attentive solutions to the environment, to the needs of athletes and the usability of sport for athletes and fans.

A.2.23 Tourism (sport tourism)

In addition to tourism for participation in sporting events as spectators, the occasional practice of sports in holiday resorts is widespread. This can have impacts on the territory of tourist destinations due to the modification of the natural environment and intensive exploitation in limited periods of the year. The long-term effects are due to the accommodation and sports facilities and the interaction with the ecosystem with changes in the behavior of animals and impact on the native flora. Furthermore, the resources employed can compete with those needed for the creation of spaces suitable for sport in the places where everyone lives.

This phenomenon falls within the sphere of tourism and the modalities of the practice are associated with entertainment and pastime. However, in the common sense of the term and given the fact that there are sports clubs that provide services through instructors and equipment, this phenomenon is associated with sport.

Responsible concern for environmental

The fact that a particular sport is practiced in an attractive environment should be accompanied by evidence that it is sustainable and does not cause harm also in relation to the number of practitioners. Those who travel and practice sports in holiday areas should

have been informed of the possible environmental impact and the necessary measures to eliminate it.

Promoting Sustainable Development in Sport

FIs and NFs should consider the use of equipment and systems that impact the nature of places and require energy (eg ski lifts and snowmaking in ski resorts) so that such use is optimized and limited. Training and competition regulations could also demonstrate the sport’s commitment to reducing its environmental impact. For example, in the mentioned case of skiing, it could be emphasized that although skiers have fun and compete downhill, their training is tough and requires walking up the slope. A sport practiced in a sustainable way can be a model for tourists looking for fun and to avoid mass phenomena, fashion and economic affairs at the expense of nature.

Holding environmentally responsible Olympic Games

Sports that reinforce environmentally aggressive tourism should demonstrate their commitment to addressing and countering this phenomenon in order to be included in the Olympic program.

A.2.24 Tournaments (Globalization part I - international tournaments)

The number of international trophies is also increasing and many athletes who practice individual sports such as tennis, skiing, athletics are constantly moving from one part of the world to another according to a remarkably crowded calendar of competitions. The same phenomenon applies to team sports which involve international trophies with a considerable number of away matches. Furthermore, in some cases, national competitions are held in countries far from those to which the athletes or teams belong, to attract the public and sponsors (for example, the final of a national football cup can be played in another country).

Responsible concern for environmental

Athletes, teams, coaches, sports managers, referees and spectators should be informed on how to reach competition and training venues more responsibly and how their travel can compromise the sustainability of the sport.

Promoting Sustainable Development in Sport

The assessment of the environmental impact of an event depends on factors of scale that should be considered by the organizers at city, regional, national, up to international and

world level. This means that IFs and NFs should also consider measures to reduce and compensate for the environmental impact of travel for better planning of competition and training calendars of federations, clubs and athletes.

Holding environmentally responsible Olympic Games

The IOC and OCOG do not deal directly with tournaments but this issue allows to mention some considerations that fall within their competence.

The management of the races of a mega event such as OGs has the ambition to bring together all athletes from all over the world and from all disciplines with a very short calendar (the Summer Olympics last 2 weeks). The IOC's scope for intervention on planning is therefore minimal, except for the choice of cities capable of guaranteeing the most favorable environmental and climatic conditions and the most suitable infrastructures to host OGs. The other activities of the IOC and OCOG in this area are the same as those concerning issues A.2.26 and A.2.27. The meeting and travel plans of all IOC and OCOG personnel involved in the organization of the OG should be subject to an environmental impact assessment and the methods of meetings, including via web, and the means of transport to be used should be carefully considered. The same approach should be applied to assess how all athletes, staff, media and spectators arrive in the OG host city and return to their home countries and how to act further (in agreement with IF and NF) on schedule planning of the championships and tournaments also taking into account the rest periods of the athletes.

Compensatory environmental measures could be split by the OM among all tiers, including those of the nations participating in the games.

A.2.25 Training (environmentally sustainable training)

By carrying out a search on the numerous scientific and sports sites with the keywords "Environmental Sustainability" and "Athletic Training", as confirmed also by Potteiger (2020) there are very few studies. Much could be done to reduce the environmental impact of training in particular with regard to the production of waste, including those relating to health care that uses disposable materials, paper, plastic, copious amounts of water that is often wasted. The ability to organize training spaces, have water in reusable containers, use chilled ice bags instead of single-use chemicals, use elastic bandages instead of disposable taping, reduce the paper used for training programs, arrange separate waste collection, drinking fountains and the use of left over water to irrigate plants are some of the activities that could

be implemented. Factors such as the convenience of disposable products and the excessive cost of other green products, combined with a lack of awareness of the correct actions to be taken, are factors that limit the adoption of green behaviors (Potteiger, Pitney, Cappaert, & Wolfe, 2016) (Potteiger, Pitney, Cappaert, & Wolfe, 2016b) (Robinson, 2020) (MAC Athletics, 2011) (González-Serrano, Sanz, & González-García, 2020).

Responsible concern for environmental

Athletes of all levels (even those who practice unorganized physical exercise) are often not aware of the environmental impact of their activity and give priority to their fitness and performance ambition. Information campaigns should focus in particular on how to limit use to non-renewable resources and contain the generation of waste.

Promoting Sustainable Development in Sport

IFs and NFs could indicate requirements to be respected in training and facilitate athletes in the vicinity of their venues: some technologies could be enhanced and others be limited. For example, running on the treadmill could be evaluated considering the consumption of unnecessary energy while it could be studied how to recover the physical energy expended in exercise. Similarly, training could become greener if we consider the best times and locations in order to reduce the needs for heating, cooling and lighting. Other research should make it possible to verify the amount and type of training waste and how to reuse the materials or better dispose of them.

Holding environmentally responsible Olympic Gamess

The IOC and OCOG should also make equipment available and facilitate training methods that can better meet the need to contain the use of non-renewable resources in the Olympic Village and Games Venue. Olympic athletes who train and live responsibly with respect to environmental issues can give an example regarding methods, equipment, sports tourism, travel and all activities related to the practice of physical exercise.

A.2.26 Travel (for training, for participation in seminars, meetings at all levels of organization)

Many endurance athletes spend a few weeks in the mountains during the training period to change certain blood parameters. Other athletes also move from one hemisphere to another to look for the climatic conditions suitable for training at any time of the year. These trips have the potential to increase the environmental impact of training. Furthermore, it should be

verified how much the training methods contribute to the balanced development of the person and how much simply to obtaining physiological adaptations. In any case, the times and methods of training determine the environmental impact of each athlete that should be evaluated.

Within the federations, many updating activities of technicians, referees, managers, assemblies at a territorial, national and international level, checks of the places and structures that will host the events, are just some examples of the many travel reasons and events of possible environmental impact.

Responsible concern for environmental

Participation in refresher courses for managers and technicians at all levels, as well as athletes of the same specialty in rallies or training in environmental conditions different from those of their own headquarters, are generally desirable and useful experiences. However, environmental impact aspects should be considered and all participants should be aware of this issue.

Promoting Sustainable Development in Sport

The IOC and the Federations should take care to convey at all levels the principle that trips made for training purposes and to participate in seminars and operational meetings should be well planned and carried out only when necessary, taking into account their environmental impact. All levels and events should be minimized by using forms of distance communication whenever possible. Incentives involving travel and the purchase and management of cars and other means of transport of the Federations and the IOC should be evaluated taking into account environmental sustainability.

Holding environmentally responsible Olympic Games

See issue A.2.24.

A.2.27 Travels of atlhetes (Globalization part II)

There are effects of the globalization process in team sports such as football, volleyball, basketball and rugby. Teams are often made up of athletes who come from different continents. This involves further travel for many athletes to join their families or to compete with their national team on their continents and countries of origin.

Responsible concern for environmental

Although it is a extremely difficult problem to manage and strictly linked to item A.2.24 (tournaments), athletes and teams should be aware that reducing their travel and traveling responsibly would have positive consequences for the environment.

Promoting Sustainable Development in Sport

IFs and NFs should consider the continuous movement of athletes around the world (including those to return to their families and join national teams) and should take this into account in the environmental sustainability report of the sports clubs they belong to. This assessment should be followed by adequate environmental compensation measures and act further on scheduling calendars and planning of championship break periods for atletes’ rest.

Holding environmentally responsible Olympic Games

See issue A.2.24.

A.2.28 Water (use of water and water saving)

Lack of water is increasingly problematic in many parts of the planet in relation to over exploitation in agriculture, livestock, industry, high population density and as a consequence of climate change and pollution. The water used should be purified to avoid carrying biological and chemical pollutants responsible for environmental damage in the subsoil, in river systems and in the sea. Forecasts indicate that the availability of water will be an increasingly critical and strategic aspect for a growing number of peoples in the world (Ault, Cole, Overpeck, Pederson, & Meko, 2014). In addition to the repercussions on agricultural production with effects on food security, a lack of water can lead to disease, desertification and other environmental damage. Procurement activities through drilling, river diversion, lake withdrawal, sea water desalination are responsible for further direct and indirect environmental damage, linked to energy expenditure, landscape change and further subtraction of water from ecosystems already in pain. Sport consumes a significant amount of water for irrigation of playgrounds, golf courses, for the operation of swimming pools, hockey fields and for the activity of athletes and fans. Consumption depends on the places where the sports venues are located and, in the case of lawns, on the objective of having extremely regular playing surfaces, often consisting of non-native monoculture grass planted on draining soil. The number and size of the fields increase and the conformation of the stadiums does not allow the spontaneous growth of the turf. In this scenario, water consumption reaches

enormous amounts compared to the number of events hosted in the calendar year with severe distraction from other vital needs of communities. New technological water management systems make it possible to recover and store rainwater, reuse water for bathrooms and limit consumption for laundries, restaurants inside the facilities and toilets. Innovative irrigation and soil preparation techniques and the return to a mix of native herbs allow to rationalize the use of water. These solutions contain management costs and have the effect of reducing the environmental impact (Nick, 2015). Technology adds to water saving education programs, which alone can allow a 60% reduction in consumption (Roccaro, Falciglia, & Vagliasindi, 2013). Much remains to be done to contain water consumption and limit it to the use of rain falling on sports facilities. For exceptionally large stadiums which host numerous events with many spectators and which are located in areas with little rain, this is an impossible goal and requires environmental compensation measures.

Responsible concern for environmental

Awareness-raising campaigns to reduce water consumption and avoid pollution run parallel to those to preserve the air and the environment in a broad sense. Suitable educational programs are needed to inform on how individual behaviors can better contribute to the protection of this indispensable asset even during sports practice or participation in sporting events as spectators and in all aspects of daily life.

Promoting Sustainable Development in Sport

FIs and NFs should at all levels comply with best technological and behavioral practices, to control the consumption and purification of the water used, with objectives and programs defined over time. Regulations can also be used for this purpose: for example, appropriate and sufficient conditions could be established for playing on a grassy lawn rather than allowing excessive consumption of water to make it perfect.

Holding environmentally responsible Olympic Games

The consumption of water, which has a direct impact on the environment, similar to that of the use of non-renewable energy resources, is a fundamental point of the sustainability strategy of the games and should be pursued by the IOC and the OCOG. The interventions to be implemented extend across all the choices concerning infrastructures, health, sanitation, nutrition and hydration, materials (including clothing and equipment) that consume water in manufacturing. Of course, it is also necessary to evaluate how to optimize the use of this resource for the various disciplines in the specific context of OGs.

Leopkey's table (Leopkey, 2009, p. 10-11) is proposed below, modified by adding the columns "Sustainability / legacy" and the strategic objective of the IOC in the context of sustainability deemed pertinent to each item. The other columns are the original ones of the table and refer to the Preuss classification criteria (Preuss, 2007, p. 86).

The additional columns were filled in by associating the original entries with the corresponding objectives / intentions in the strategic documents of the IOC (IOC, 2017b, p. 42-43). The association proposed here should be the subject of study and verification. Furthermore, it was taken into account that the OCOG has the right to define the legacies it intends to achieve and can consider additional objectives to the strategic ones (in this case "opt" is related to "optional").

Table 6 – Event Legacy Summary

Type of event legacy	*Sustainability/Legacy*	*IOC objectives* [15]	Tangible/ Intangible	Planned/ Unplanned	Positive/ Negative	References
Sporting legacy (increased participation, program development	*Legacy (People)*		Intangible	Planned Unplanned	Positive Negative	(Cashman, 2005); (Cashman & Hughes, 1998); (Chappelet, 2006); (Coalter, 2004); (Girginov & Hills, 2008); (Toohey, 2008); (Zimmerman, 2007)
Economic legacy (including tourism, economic development, business development, and profit)	*Sustainability Legacy (City)*	*010*	Tangible	Planned Unplanned	Positive Negative	(Anderson & Solberg, 1999); (Cashman, 2005); (Cashman & Hughes, 1998); (Chappelet, 2006); (Kasimati, 2003); (Preuss, 2004), (Preuss, 2007); (Ritchie J. R., 1984), (Ritchie J. R., 2000); (Solberg & Preuss, 2007); (Terret, 2008); (Toohey, 2008), (Weed, 2008); (Zimmerman, 2007)
Infrastructure/ physical legacy	*Sustainability 1-3 Legacy - Venues*	*01*	Tangible	Planned	Positive Negative	(Cashman, 2005); (Cashman & Hughes, 1998); (Chalkley & Essex, 1999); (Chappelet, 2006); (Essex & Chalkley, 2004); (Jones, 2001); (Kissoudi, 2008); (Preuss, 2007); (Ritchie J. R., 1984), (Ritchie J. R., 2000); (Searl, 2002); (Zimmerman, 2007)
Information and education legacy	*Sustainability Legacy (People)*		Intangible	Planned Unplanned	Positive Negative	(Cashman, 2005); (Halbwirth & Toohey, 2001); (Preuss, 2007); (Ritchie J. R., 2000); (Shipway, 2007); (Toohey, 2008); (Zimmerman, 2007)

[15] The numbers in this column refer to the objectives / intentions of the IOC reported in the document cited (IOC, 2017b, p. 42-43)

Type of event legacy	*Sustainability/Legacy*	*IOC objectives* [15]	Tangible/ Intangible	Planned/ Unplanned	Positive/ Negative	References
Cultural legacy	*Legacy (People)*	*014*	Intangible	Planned Unplanned	Positive Negative	(Cashman, 2005); (Cashman & Hughes, 1998); (Khan, 2004); (Kidd, 1992); (Preuss, 2007); (Ritchie J. R., 1984); (Ritchie J. R., 2000); (Shipway, 2007); (Zimmerman, 2007)
Symbols, memory and historical legacy	*Legacy (Obj 3)*		Intangible	Unplanned	Positive Negative	(Cashman, 2005); (Cashman & Hughes, 1998);
Urban legacy (e.g., city transformation and urban regeneration)	*Sustainability Legacy (City)*			Planned	Positive Negative	(Carlsen & Taylor, 2003); (Chalkley & Essex, 1999); (Chappelet, 2006); (Essex & Chalkley, 1998), (Essex & Chalkley, 2004); (Ritchie J. R., 2000)
Psychological legacy (e.g., community pride, public life)	*Legacy (People) (Opt)*		Intangible	Planned Unplanned	Positive Negative	(Cashman, 2005); (Preuss, 2007); (Ritchie J. R., 1984), (Ritchie J. R., 2000); (Zimmerman, 2007)
Social legacy (e.g., housing, social programs)	*Sustainability Legacy (People)*		Intangible Tangible	Planned Unplanned	Positive Negative	(Chappelet, 2006); (Lenskyj, 2000), (Lenskyj, 2002); (Raco, 2004); (Ritchie J. R., 2000); (Shipway, 2007); (Toohey, 2008), (Waitt, 2003)
Environmental legacy	*Sustainability Legacy (Opt)*	*01, 02, 03, 04, 05, 08, 09, 010, 011, 012*	Intangible	Planned Unplanned	Positive Negative	(Briese, 2001); (Chappelet, 2008); (Levett, 2004); (Toohey, 2008), (Zimmerman, 2007)
Political legacy	*Sustainability Legacy*		Intangible	Planned Unplanned	Positive Negative	(Burbank, Andranovich, & Heying, 2001); (Cashman, 2005); (Ritchie J. R., 1984); (Toohey, 2008)
Destination image legacy	*Sustainability Legacy (City)*		Intangible	Planned Unplanned	Positive Negative	(Brown, Chalip, Jago, & Mules, 2004); (Dyreson & Llewellyn, 2008); (Morse, 2001); (Preuss, 2007); (Ritchie & Smith, 1991); (Whitson & Macintosh, 1993); (Xing & Chalip, 2006)
Health legacy	*Sustainability/ Legacy*	*06, 07*	Intangible	Planned Unplanned	Positive Negative	(Shipway, 2007)

A further distinction has been proposed by Chappelet (2012, p. 78) and concerns personal and territorial legacy. Personal legacy belongs to the individual, as an athlete, citizen, spectator, volunteer or person involved in the organization. This legacy remains part of people's baggage wherever they go in the future. The territorial legacy remains instead associated with the place of the event.

(UNESCO, 2019. "Measurement Strategy for SDG Global Indicator 4.7.1 and Global Indicator Thematic Indicators 4.7.4 and 4.7.5 using International Large Scale Assessments in Education", GAML6/REF/9 *Table 1. Global Content Framework for SDG indicators 4.7.1, 4.7.4 and 4.7.5*)

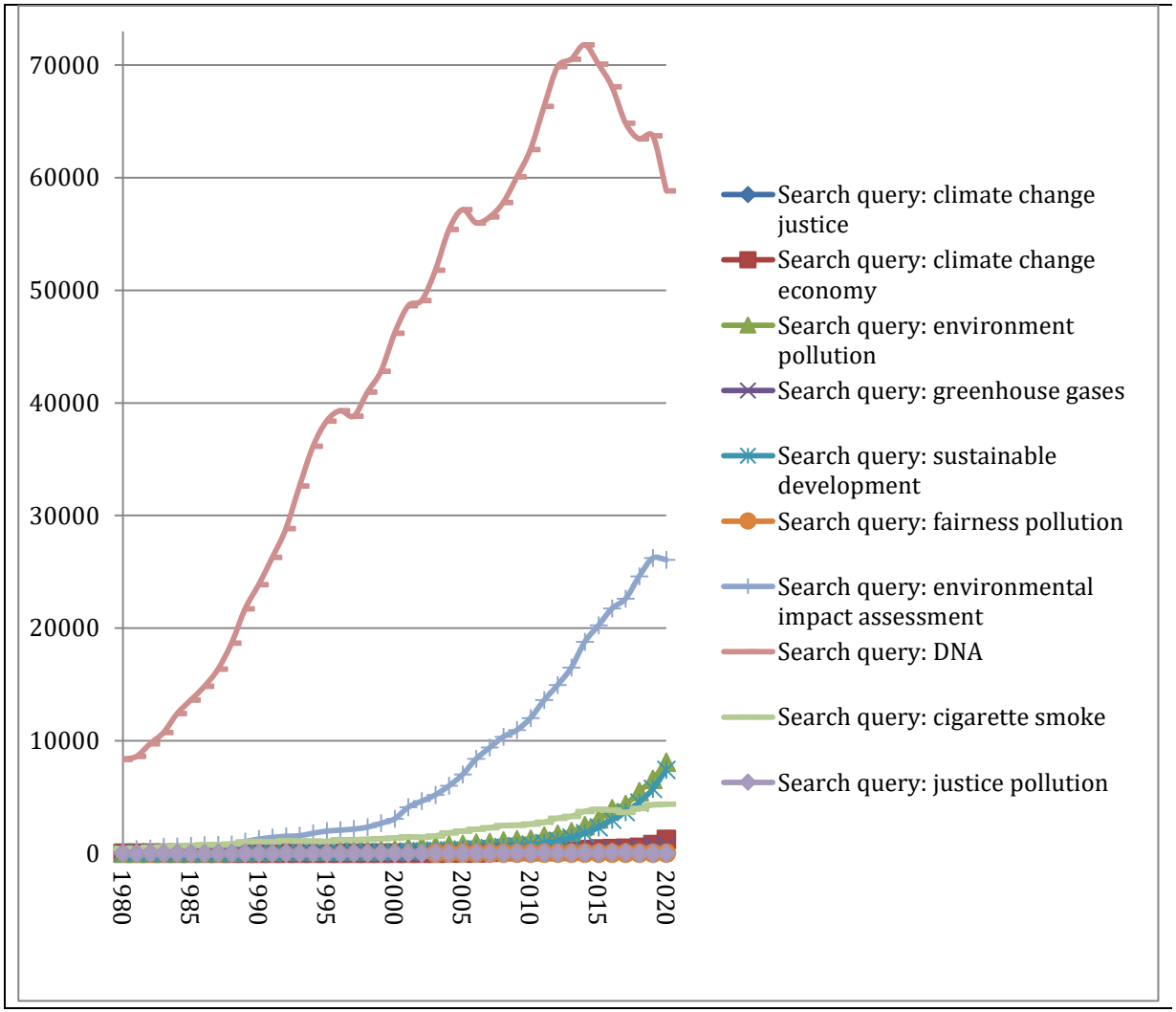
Table 7 – SDG Global Indicator 4.7.1, 4.7.4 and 4.7.5

	Category	**Sub-category**	
Global Citizenship Education (GCED)	Interconnectedness and Global Citizenship	Globalization	
		Global/international citizen(ship), global culture/identity/community	
		Global-local thinking, local-global, think global act local, glocal	
		Multicultural(ism)/intercultural(ism)	
		Migration, immigration, mobility, movement of people	
		Global Competition/ competitiveness/ globally competitive/ international competitiveness	
		Global Inequalities/disparities	
	Gender Equality	Gender equality / equality / parity	
		Empower(ment of) women/girls (female empowerment, encouraging female participation)	
	Peace, Non-violence and Human Security	Peace, peace-building	
		Awareness of forms of abuse/harassment/violence (school-based violence/bullying, household-based violence, gender-based violence, child abuse/harassment, sexual abuse/harassment)	
	Human Rigts	Human rights, rights and responsibilities (children's rights, cultural rights, indigenous rights, women's rights, disability rights)	
Education for Sustainable Development (ESD)		Freedom (of expression, of speech, of press, of association/organisation), civil liberties	
		Social justice	
		Democracy/democratic rule, democratic values/principles	
	Health and Well-being	Physical health/activity/fitness	
		Mental, emotional health, psychological health	
		Healthy lifestyle (nutrition, diet, cleanliness, hygiene, sanitation, *clean water, being/staying healthy)	
		Awareness of addictions (smoking, drugs, alcohol)	
		Sexual and/or reproductive health	
	(Category)[16]	(#)[16]	**(Sub-category)[16]**
	Sustainable Development	(1)[16]	Economic sustainability, sustainable growth, sustainable production/consumption, green economy
		(2)[16]	Social sustainability, (social cohesion re sustainability)
		(3)[16]	Environmental sustainability/environmentally sustainable
		(4)[16]	Climate change (global warming, carbon emissions/footprint)
		(5)[16]	Renewable energy, alternative energy (sources) (solar, tidal, wind, wave, geothermal, biomass…)
		(6)[16]	Ecology, ecological sustainability (ecosystems, biodiversity, biosphere, ecology, loss of diversity)
		(7)[16]	Waste management, recycling
	Environmental Science (geoscience)	Physical systems	
		Living systems	
		Earth and space systems	

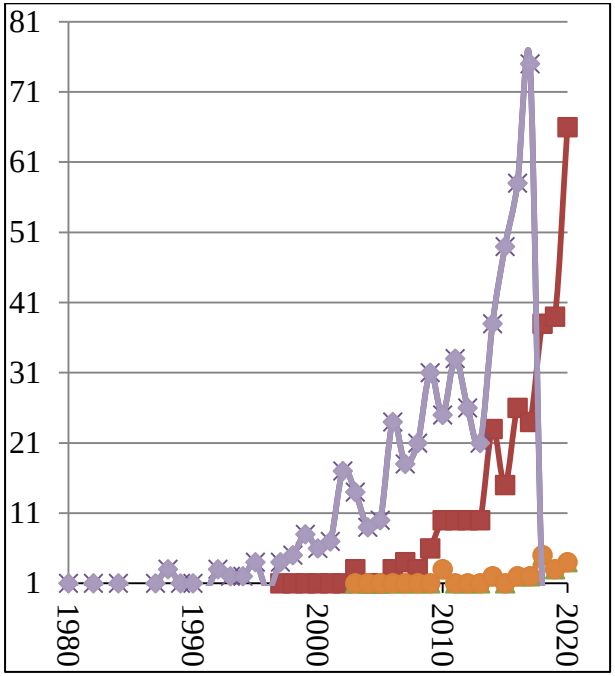
[16] The fields with the writing in brackets have been introduced to be used as a reference in Table 1

Figure 1 – Trend in the number of publications related to the specified key words.

(from 1980 to 2020 on the scientific platform https://pubmed.ncbi.nlm.nih.gov)



Horizontal axis: year;
Vertical axis: number of articles (data consulted on 10 February 2021 and referring to all types of published documents; some topics, such as cigarette smoking and DNA, are used comparatively)



DOI: 10.13140/RG.2.2.21220.30088

SCAN ME

Picture – 3 – Students of the 2019-20 Cohort at the opening ceremony of the academic year in September 2019

Picture – 4 – Students of the 2019-20 Cohort in the Ancient Olympia Stadium

Picture – 5 – Some students of the 2019-20 and 2020-21 Cohorts during a lesson in May 2021 - Second semester in distance learning due to the Sars-Cov-2 pandemic