

# *The importance of making sport sustainable*

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## *Abstract*

In the last few decades, climate change has become a real crisis with important consequences on many socioeconomic contexts, such as the sport sector. In fact, sports training and competitions are more and more threatened by extreme weather events and hot temperatures. Since the social and individual benefits of sport are well known, this could lead to further negative consequences. At the same time, sports industry and the other sport-related sectors such as sponsorship, apparel, media, and travel sectors contribute to the environmental crisis. Therefore, substantial changes are needed in this setting, in order to adapt the sport activities to the changing climate and to achieve sustainability.

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## **Introduction**

### *Climate crisis and sustainability*

In the last few decades, climate change has become a real crisis. In 2013-22, the global mean temperature reached 1.14°C above pre-industrial levels, progressively impacting the mental and physical health

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and survival of people worldwide, and projections suggest these risks could worsen in the future (Romanello *et al.* 2023). Each year, thousands of people are killed or affected by extreme temperatures, wildfires, floods and drought which in turn can generate food insecurity and favor the spread of infectious diseases (Pörtner *et al.*, 2023). At the same time, essential infrastructures are also damaged, and socioeconomic conditions of entire populations, especially of the most vulnerable ones, are constantly threatened (Romanello *et al.* 2023).

The evident impact of climate crisis on human life and the increasing awareness that it strictly depends on human activities, the need to undertake effective solutions have been taken in account by several international organizations. In particular, the need for making human activities sustainable in order to improve people and planet health has become essential.

In 1987, the United Nations Brundtland Commission defined sustainability as “meeting the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987).

In 2015, all United Nations Member States adopted the 2030 Agenda for Sustainable Development, which contains the 17 Sustainable Development Goals (SDGs) that all countries are called to achieve in a global partnership in order to guarantee a prosperous and peaceful future for the worldwide population and for the planet (Table 1) (United Nations, 2015).

Table 1 - UN 2030 Sustainable Development Goals

Goal 1. End poverty in all its forms everywhere
Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Goal 3. Ensure healthy lives and promote well-being for all at all ages
Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Goal 5. Achieve gender equality and empower all women and girls
Goal 6. Ensure availability and sustainable management of water and sanitation for all
Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all
Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Goal 10. Reduce inequality within and among countries

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Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

Goal 12. Ensure sustainable consumption and production patterns

Goal 13. Take urgent action to combat climate change and its impacts

Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 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

Goal 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

Goal 17. Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

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Countries from all over the world are currently engaged in meeting these goals, but the increasing threat of climate change make difficult this achievement, especially for the developing ones.

### *Sport and climate change*

Physical activity in all its forms plays an important role for communities: it positively influences health, contributes to social cohesion, and offers employment opportunities to millions of people.

The climate emergency that the global population is currently facing, with an exponential increase in extreme weather events such as floods or heat waves, has inevitable repercussions also in the field of physical activity and sports (Bernard *et al.*, 2021).

The relationship between sport and climate is controversial: on the one hand, sports activities produce a high quantity of emissions that contribute to determining climate change, on the other extreme weather events have significant negative effects on competitions, on athletes' health and performance, but also on the levels of physical activity of the populations involved, in particular for some categories such as children and people with chronic conditions (United Nations Department of Economic and Social Affairs, 2022).

The transport of people and supplies linked to major sporting events, the production of sports equipment, the construction of sports facilities and the production of waste related to the competitions have a significant environmental impact. For example, it has been calculated that the 2008 Beijing Olympics produced emissions of 1.2 million tons of CO<sub>2</sub>, which

rose to 3.4 million in the 2012 London Olympics and 3.6 million in the 2016 Rio de Janeiro Olympics (Goldblatt *et al.*, 2020).

Various factors may contribute to the environmental footprint of the different sports. Some sports activities may imply more intensive resource use, waste generation, and greenhouse gas production than others. For example, motorsports require an intensive consumption of fossil fuels and oils, with consequent emissions of greenhouse gases; golf is practiced in wide portions of land, which are obtained through deforestation and must be maintained through a large use of water and chemicals; winter sports need complex facilities that require considerable energy consumption, even for the production of artificial snow.

On the other hand, the effects of climate change on major sporting events have become evident (Orr *et al.*, 2022). The increase in average temperatures and the unpredictability of meteorological phenomena often cause the cancellation or postponement of competitions, with significant consequences for the organizers and clubs, but also for athletes and spectators. In 2018, the devastating fires that occurred in California forced the cancellation of the National Basketball Association basketball matches at the Golden Center in Sacramento. In 2019, Typhoon Hagibis hit Japan, where the Rugby World Cup was taking place. Although the consequences on the competition were limited to the cancellation of some matches and the flooding of some facilities, it is necessary to consider the long-term consequences that this and other similar destructive events can have on sports practice, given the impact they can have on the facilities used for training or matches, but also on amateur practice, when resources useful to the whole population are affected.

With reference to the increase in temperatures, for example, during the 2020 Tokyo Olympics long-distance competitions were moved to Sapporo, due to the stifling heat recorded in the capital, with peaks of 41°C and dozens of deaths from heat stroke. Identifying cities that can host summer championships is in fact becoming increasingly difficult due to the possible exposure of individuals to extreme weather factors, just as the holding of winter events is affected by the lack of snow and ice. It has been estimated that only 10 locations will be able to host winter sports by 2050, and only six by 2080. In addition, the increased degradability of snow due to higher temperatures increases the likelihood of injuries. During the 2014 Sochi Paralympics, for example, the injury rate was six times higher than at the 2010 Vancouver Games.

As for the impact that climate emergency can have on the health of athletes and spectators, in recent years research has focused in particular on the effects of exposure to high temperatures (Bernard *et al.*, 2021).

Hyperthermic stress phenomena such as heat stroke or sunstroke are increasingly frequent among athletes, and the association between exposure to high temperatures and lower resistance, greater possibility of making errors during practice and greater aggressiveness in the game has been demonstrated.

Not all athletes are at the same risk of being negatively affected by exposure to high temperatures. For example, endurance athletes are at greater risk due to the high intensity of training and the length of training sessions and competitions. The main factors that determine the likelihood of experiencing heat-related problems include in fact environmental conditions such as temperature and humidity, but also the intensity and duration of exercise, as well as the clothing worn and individual factors such as age, body size and general health (Ebi et al., 2021).

### *Sport and sustainability*

The fundamental role of sport in promoting education, health, development and peace was underlined by the United Nations on 16 October 2014, which encouraged Member States to give sport due consideration in the context of the post-2015 development agenda (United Nations General Assembly, 2014).

Due to its global reach and its universal language, the sport sector, which gathers millions of people, practitioners, and professionals from all ages around the world, has the potential of promoting education, health, development and peace in communities, also engaging socially excluded groups (International Olympic Committee, 2015).

In 2015, the Commonwealth Secretariat made a consultation of sport and development experts to assess how sport can contribute to the achievement of SDGs. Participants identified seven goals and the ways in which sport could act to reach them (The Commonwealth, 2015).

The first goal is “SDG 3: Ensure Healthy Lives and Promote Wellbeing for All, at all Ages”. The Commonwealth highlighted the role of sport and physical activity in reducing the risk of developing non-communicable diseases by fighting inactivity, which is responsible for more than 3 million deaths each year and has a notable economic burden. Moreover, sport can convey health messages to several population groups.

The second goal to which sport can contribute is “SDG 4: Ensure Inclusive and Equitable Quality Education and Promote Lifelong Learning Opportunities for All”. Sport and physical activity have been recognized as fundamental rights by the International Charter of Physical

Education and Sport. Physical education is an inclusive instrument for the development of physical literacy and other learning outcomes, having positive effects on academic performance of all children.

Furthermore, by promoting gender equality, sport can also contribute to the SDG 5 “Achieve Gender Equality and Empower all Women and Girls”.

In addition, the Commonwealth’s report underlines the capacity of sport to create job, and then to contribute to the achievement of SDG 8 “Promote Sustained, Inclusive and Sustainable Economic Growth, Full and Productive Employment and Decent Work for All”.

Finally, it is recognized the role that sport can have in bringing people together and improve societies and cities (SDG 11 “Make Cities and Human Settlements Inclusive, Safe, Resilient and Sustainable and 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”), even through global partnership (Goal 17 “Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development”).

In 2017, the Sixth International Conference of Ministers and Senior Officials Responsible for Physical Education and Sport held in Kazan, Russia, produced a detailed plan of the ten goals and 36 targets on which sport can have the biggest impact (United Nations Educational, 2017). In addition to the goals highlighted by the Commonwealth, the Kazan Action Plan considered that sport can have a role even in achieving SDG 10 (reducing inequalities), SDG 12 (responsible consumption and production) and SDG 13 (combat climate action).

The United Nations Office on Sport for Development and Peace, instead, assumed that sport may contribute to all the seventeen SDGs: in 2024, the United Nations General Assembly consensus declared “Sport as an Enabler of Sustainable Development” (United Nations General Assembly, 2024).

In particular, a key role in combatting climate change has also been attributed to sport (United Nations Department of Economic and Social Affairs, 2022). The United Nations highlighted that, reaching and influencing millions of people worldwide, sport can increase individuals’ education and awareness on climate change. Athletes and teams can serve as role models for planet-saving behaviors to their supporters, especially the young ones. Furthermore, sport is increasingly recognized as a low-cost, high-impact tool to address global warming and reach sustainable development. Finally, reducing sport climate footprint through the

incorporation of sustainability standards in the sport industry can lead to sustainable production and consumption standards in other sectors.

### *How to make sport sustainable?*

In recent years, an increasing number of virtuous initiatives, both public and private, have been adopted at international and national levels (Goldblatt *et al.*, 2020).

The effects of climate change on the conduct of competitions can be addressed by choosing suitable locations or adequate planning that takes into account weather and climate factors, or by adopting solutions such as shading and air conditioning systems. However, when identifying such strategies, it is necessary to take into account the possible economic and environmental impacts that they may have and base them on the principle of sustainability. The organizers of the 2022 FIFA World Cup in Qatar, for example, had to face similar challenges, since the interventions aimed at cooling the air in the outdoor facilities entailed significant costs and environmental consequences.

Several sports organizations have started to initiate actions such as reducing their emissions or building new facilities based on cutting-edge standards. Some clubs have also sought to raise awareness of climate issues among their members and fans, inspiring other clubs to follow their model. The US Tennis Association introduced, in 2018, an “extreme heat strategy”, to allow players to take periodic breaks in the presence of high temperatures. It is also appropriate that those who practice physical and sports activities are made aware of the problems they may encounter in relation to exposure to extreme weather conditions and educated on the prevention strategies to adopt.

Many organizations and participants are working to implement more sustainable practices, such as the use of renewable energy, responsible waste management and environmental awareness. Improving the sustainability of sports depends to a large extent on the adoption of greener practices at the individual and organizational level.

In Germany, for example, the Bayer Leverkusen football club has drastically reduced the use of single-use plastics, employ renewable energy for its activities and well water for irrigation; in Great Britain, the England’s Forest Green Rovers football club uses exclusively clean energy and recycles rainwater, representing the world’s first UN-certified carbon-free team (United Nations Department of Economic and Social Affairs, 2022).

At the international level, the International Olympic Committee (IOC) has developed a Sustainability Strategy which focuses on climate action with the goal of moving beyond carbon neutrality and make the games carbon negative by 2030 (International Olympic Committee, 2018). To this aim, a “Strategic intents for 2030” plan was set to reduce both direct and indirect greenhouse gas emissions for operations and events associated with the Olympic Movement’s activities, and to adapt sport facilities and events to the consequences of climate change. Indeed, commitment to climate action is now required to cities which candidate themselves to host the Olympic Games (International Olympic Committee, 2017). As a consequence, the Tokyo 2020 summer Olympics strategy for climate action, included the use of pre-existing buildings and renewable energy for games and operations, and the engagement in a carbon offset program (United Nations Department of Economic and Social Affairs, 2022).

In 2016, the United Nations Sport for Climate Action Framework was launched by the United Nations Framework Convention on Climate Change (UNFCCC) and some of the leading sport entities with the aim of providing a systematic framework to the multiple existing initiatives (United Nations Climate Change, 2016). The UNFCCC encourages sport organizations to take systematic measures in order to reduce their carbon emissions and reach climate neutrality by 2050.

Believing in the leadership role that sport can play in driving climate neutrality beyond the sport sector, the Sports for Climate Action (United Nations Climate Change, 2016) brings together sports organizations and their communities in order to pursue two goals:

1. “Achieving a clear trajectory for the global sports community to combat climate change, through commitments and partnerships according to verified standards, including measuring, reducing, and reporting greenhouse gas emissions, in line with the well below 2 degree scenario enshrined in the Paris Agreement”;
2. “Using sports as a unifying tool to federate and create solidarity among global citizens for climate action” (United Nations Climate Change, 2016).

With global signatories joining every day, the Sports for Climate Action network has included climate action in the agenda of the sports industry and is tracing the future of sport. This commitment implies for signatories the implementation of actions to reduce greenhouse gas emissions and the transparent communication of their progress. Three years after the establishment of Sports for Climate Action framework,



signatories were requested to halve emissions by 2030 and aim to achieve net-zero by 2040.

The participants to the Sports for Climate Action Initiative support the goals of the Paris Agreement in limiting global temperature rise to 1.5 degrees Celsius above pre-industrial by adhering to five principles:

1. Undertake systematic efforts to promote greater environmental responsibility;
2. Reduce overall climate impact;
3. Educate for climate action;
4. Promote sustainable and responsible consumption;
5. Advocate for climate action through communication.

By adopting these targets, sport sector will really contribute to the sustainable growth of healthy, resilient, and zero carbon communities.

## Conclusions

Sport can consistently contribute to tackle climate change and increase sustainability worldwide. In the last few years, many initiatives have been taken in this direction. However, to reach this goal, several stakeholders are called to make further efforts.

First of all, sport must become sustainable by reducing its greenhouse gas emissions and non-renewable energy use, and governments should support these changes by establishing policy frameworks and incentives.

Furthermore, in order to promote sport as a tool to raise people's awareness about climate change, it is fundamental that national governments, in collaboration with international organizations, create collaborations with private actors, academia, science and technology sectors, and citizen communities and organizations. These partnerships are essential to allow sports leading climate actions among other sectors and changes in citizens' lifestyles.

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