

## Chapter 4: Environmental and sustainable development conditions specific to the various Olympic disciplines



### 4.4.2.4 Special waste, toxic products and sources of pollution linked to open-water swimming

A priori, there are no toxic products linked to open-water swimming. However, a warning should be given about perfume and sun cream products used by swimmers, which are released into the water.

Perfume products use elements known as polycyclic musks, some of which (Galaxolide®, Abbalide®, Tonalide®, Fixolide® and Astralide®), while not poisonous to wildlife, are difficult to biodegrade and accumulate in the food chains, particularly the aquatic food chain. To avoid this, you should not apply perfume before swimming in open water.

Protection against ultraviolet radiation is becoming increasingly indispensable, especially because of the seasonal hole in the ozone layer. However, some products used in these filters (Benzophenone 3, Homosalate, 4-Methylbenzylidene Camphor, Octyl Methocyanamate and Octyl Dimethyl PABA) can accumulate in fish and are suspected of having a sterilising effect, as they disrupt the endocrine system. For this reason, sun creams containing these five molecules should either be avoided or used only after swimming in open water.

### 4.4.2.5 Other aspects of open-water swimming linked to sustainable development

Open water is the most natural place to learn to swim. It is an excellent way of exploring the aquatic environment, pitting oneself against the forces of nature (waves and currents) and assessing the place of humanity within this world. It is a recreational environment to be enjoyed by all generations. Open-water swimming is also a sport which, being open to all social categories and all ages, enables the various members of society to meet and share a common activity.

## 4.5 Land-based sports in open-air stadiums

### 4.5.1 General

Land-based individual and team sports practised in open-air stadiums include athletics, tennis, archery and shooting sport. Team sports are football, baseball and hockey. This chapter also deals with pentathlon and triathlon, even though it also includes disciplines practised indoors and in the natural environment, as well as swimming.

The main environmental aspects of land-based sports practised in open-air stadiums relate to stadium construction, equipment management, event organisation and the conduct of participants and spectators. The other contribution these sports can make to sustainable development concerns their role in helping athletes from the most disadvantaged social backgrounds to be integrated into society or to climb the social ladder.

The popularity and media attention enjoyed by land-based sports played in open-air stadiums means that they can set an important example by promoting the image of sustainable development among the general public.

### 4.5.2 Athletics

#### 4.5.2.1 General

Apart from the marathon, walking events, cross-country, road events and events in the mountains, most disciplines of athletics take place in stadiums. This chapter looks at the environmental and sustainable development aspects of all the disciplines involved in an athletics competition, whether held in a stadium or in the natural environment, as well as recreational running and walking.

#### Some facts

- Athletics is one of the four Olympic disciplines that have been included in all editions of the modern Olympic Games, since 1896.

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- Relay races for messengers over distances of between 3 and 5 kilometres were very popular among the Incas.
- The first Olympic medal of the modern era was presented in athletics to James Connolly, winner of the triple jump, on 6 April 1896.
- The marathon event at the first Games in Athens, won by Spyridon Louis, was run over a distance of 40 km. The current distance of 42 km 195 m was not introduced until the 1908 Games in London. The Games Organising Committee added 195 m to the 42 km, which was more or less the equivalent of 26 miles, on account of the distance from Windsor Castle to the royal box at the stadium in London.
- At the Athens Games in 2004, marathon runners breathed in at least three times more methane and 30% more carbon dioxide than Spyridon Louis did at the first Games in Athens in 1896.
- A marathon runner can sweat up to 4 litres per hour in hot, humid conditions!
- In Canada, around 3,700 km of abandoned railway tracks have been converted into paths for walking, jogging and horse riding.

### 4.5.2.2 An environment-friendly approach to athletics

In themselves, the different athletics disciplines practised in stadiums or the natural environment do not pose a threat to the natural environment as long as the athletes respect various rules of conduct which are the same as those that should be followed by everyone in their daily lives.

#### Rules of conduct for preserving the environment for athletics events

- Whenever possible, travel to the stadium or race venue by public transport, bicycle or on foot;
- Consider when possible, the use of products that conform to environmental and sustainable development criteria;
- Never throw away empty bottles, packaging or food waste in the stadium or in the natural environment. Place them in the bins provided or take them away and dispose of them at the club or at home;
- Never leave behind worn-out or damaged equipment (shoes, clothing, various accessories) in the stadium or in the natural environment. Give them to a company that treats, recovers or recycles solid waste;
- Never go jogging in protected natural environments.
- When jogging in the countryside, use existing paths. Do not run across gardens, cultivated fields or pasture;
- When jogging in the countryside, respect the traditions of the local population. Find out in advance about local traditions, cultures and beliefs.

### 4.5.2.3 Impact of athletics competitions and the necessary facilities

With regard to the rules to be respected in order to avoid environmental damage, we will distinguish between stadium-based events on the one hand and non-stadium-based events, primarily walking and marathon events, on the other.



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Figure 42: Athletics is one of the most popular and accessible sports and can be practised without damaging the environment.

### Responsibility of those involved in stadium-based athletics competitions

#### For the organisers

- Provide spectators with a convenient public transport system for travelling to the event;
- Preference should be given to day-time competitions if renewable energy is not available for lighting;
- Offer the public an adequate number of toilet and waste collection facilities which are well maintained and allow for waste water to be treated and solid waste to be recycled or destroyed without risk to the environment;
- Inform users of the rules of conduct to be observed: keep the toilets clean, save water and collect rubbish;
- Collect damaged or abandoned equipment or accessories and ensure they are properly destroyed or recycled (worn-out shoes or clothing, broken poles, hurdles or javelins, discuses, shots, etc.).

#### For the competitors

- Behave impeccably in terms of fair play and respect for the environment (do not throw rubbish, such as water bottles or packaging, inside the stadium).

#### For the public

- Whenever possible, travel to the competition venue by public transport, bicycle or on foot;
- Respect the rules of conduct on use of the toilet facilities and disposing of rubbish, particularly packaging and empty bottles.

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### Responsibility of those involved in non-stadium-based athletics competitions

#### For the organisers

- Provide spectators with a public transport system enabling them to travel along the route of the event;
- Create and clearly mark out footpaths for spectators that respect the site and its inhabitants;
- Offer the public an adequate number of toilet and waste collection facilities along the whole of the route;
- Inform users of the rules of conduct to be observed: keep the toilets clean, save water and collect rubbish;
- After the event, collect up the rubbish left by spectators in the bins provided and ensure it is properly destroyed or recycled;
- As far as media and athlete assistance vehicles are concerned, choose models equipped with anti-pollution systems (catalytic converters, particle filters) or electric, hybrid or biofuel engines;
- Repair the sites used for the event once it is finished. Set aside a sum of money to cover any compensation for damage caused to individuals or local authorities.

#### For the competitors

- Behave impeccably in terms of fair play and respect for the environment (do not throw rubbish, such as water bottles or packaging, on the ground).

#### For the public

- Whenever possible, travel to the competition venue by public transport, bicycle or on foot;
- Do not stray from the marked footpaths;
- Do not remove anything from the environment, e.g. plants, flowers, branches, pebbles, stones, shells, etc;
- Respect the rules of conduct on use of the toilet facilities and disposing of rubbish, particularly packaging and empty bottles.

#### 4.5.2.4 Special waste, toxic products and sources of pollution linked to athletics

There are no forms of special waste, toxic products or specific sources of pollution linked with athletics.

#### 4.5.2.5 Other aspects of athletics linked to sustainable development

Athletics, particularly jogging and walking, has become very popular among people living in large modern cities. This phenomenon is linked not only to the benefits it provides for physical fitness, but also to the way it relieves the stresses of every-day life. In this respect, these sports fulfil a significant social function in the sustainable development of metropolitan societies. In addition, when practised away from urban areas, walking and jogging can help to preserve respiratory functions damaged by the polluted city air.

Several athletics disciplines are suitable for athletes with disabilities. They offer an important means of integration and recognition for these athletes and help to foster public acceptance of disabilities.

Athletics is also easily accessible for all categories of the population, whatever their social background or their country's level of development. Jogging and walking in particular do not require any specific facilities and can be practised in all kinds of environments. They therefore represent an ideal way for athletes from the most disadvantaged population groups to gain recognition and climb the social ladder.

Athletics is a sport which, because it is easy and inexpensive to organise, particularly lends itself to physical education in schools. Through the variety of disciplines it covers, it can be practised at all stages of a child's physical development. Endurance events are also an excellent way of learning to manage physical effort.

Finally, the growing popularity of walking and jogging in industrialised nations can provide an opportunity to restore abandoned roads or railways and make them into paths suitable for these sports.



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### 4.5.3 Tennis

#### 4.5.3.1 General

Outdoor tennis is played on several different surfaces: natural (grass), semi-artificial (clay) and artificial (hard). It requires special equipment (net and fencing) and can seriously affect the natural environment if these facilities are not designed and maintained in a way that protects the environment.

The environmental impact of indoor tennis is mainly related to the buildings or halls in which the courts are located (see paragraph 4.6).

#### Some facts

- Modern tennis is based on real tennis, which was very popular in France in the 17th and 18th centuries and was played indoors (the French Revolution began in the real tennis hall at the Château de Versailles). Modern tennis retains two aspects of real tennis: its name (from the French word “tenez”, which players would shout before serving) and the point scoring system (15, 30, 40), the origins of which remains a mystery.
- Hard courts were developed for climatic reasons. Tennis was originally played in England at the end of the 19th century, firstly on grass but then, as the sport gained in popularity, it became necessary to build both clay and hard courts in more arid countries, where grass did not grow so well.
- According to The American Journal of Medicine (2002; 112: 689-695), older people who play tennis regularly are 40% less likely to suffer a heart attack than those who do not!
- In Japan, the Eco-Net initiative has established a system for recycling used tennis balls (around one million per year). They are reused in schools to make padded feet for table and chair legs in order to deaden the noise and protect the floors.

#### 4.5.3.2 An environment-friendly approach to tennis

The main factors of an environment-friendly approach to tennis are the means of transport used to travel to the court and the equipment used. Once they are no longer wanted, rackets and balls must be properly destroyed, recycled or reused. The carbon and glass fibres that tennis rackets are made from and the nylon strings are virtually non-biodegradable. The same is true of the nets.

The rubber in the balls deteriorates a little faster and can be recycled or reused in various ways.

#### Rules of conduct for preserving the environment for tennis

- Whenever possible, travel to the club or court by public transport, bicycle or on foot;
- Consider, when possible, the use of products that conform to environmental and sustainable development criteria;
- Never throw away empty bottles, packaging or food waste on the court. Place them in the bins provided by the club or take them away and put them in the bin at home;
- Never leave behind used or damaged shoes, clothing, rackets or balls on the court. Give them to a company that treats, recovers or recycles solid waste.

#### 4.5.3.3 Impact of tennis competitions and the necessary facilities

Tennis courts and related facilities represent an artificial addition to the natural environment. They should not be built on fertile agricultural land. Particular attention should be paid to the type of court surface used, since it is important that its permeability for rainwater and runoff remains as high as possible, particularly in arid and semi-arid areas.

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Where several courts are situated together outdoors, they should be arranged in an environmentally friendly way. The synthetic surfaces of some courts are virtually non-biodegradable, but are ideal for recycling and reuse.

### Responsibility of those involved in tennis competitions

#### For the organisers

- Climate permitting, try to hold tournaments outdoors and in the daytime rather than indoors or at night, when they use up a large amount of energy;
- Offer the public an adequate number of toilet and waste collection facilities which are well maintained and allow for waste water to be treated and solid waste to be recycled or destroyed without risk to the environment;
- Inform users of the rules of conduct to be observed: keep the toilets clean, save water and collect rubbish;
- Collect damaged or abandoned equipment or accessories (used shoes or clothing, rackets and balls) and ensure they are properly destroyed or recycled;
- On grass courts, use herbicides as little as possible, or not at all. Only consider using approved, degradable products, never organochlorates or organophosphates;
- When renovating hard courts, try to remove the used surface in such a way that it can be recycled or reused.

#### For indoor tournaments

- Choose buildings with good thermal insulation in order to reduce energy losses caused by heating or air conditioning;
- Choose installations with renewable energy systems such as wind, geothermal or solar energy systems;
- Ensure that there is no asbestos in the insulating material used.

#### For the competitors

- Behave impeccably in terms of fair play and respect for the environment (do not throw rubbish, such as water bottles or packaging, in the stadium);
- Never leave behind used rackets or balls. Give them to recycling companies or throw them away with solid waste.

#### For the public

- Whenever possible, travel to the competition venue by public transport, bicycle or on foot;
- Respect the rules of conduct on use of the toilet facilities and disposing of rubbish, particularly packaging and empty bottles.

#### 4.5.3.4 Special waste, toxic products and sources of pollution linked to tennis

Carbon and glass fibre rackets, racket strings, nylon nets and synthetic hard materials are all forms of special waste produced by tennis that can be recycled using the following processes:

- incineration: synthetic materials are burned and the heat produced by combustion is recovered, for example in cement works.
- crushing: rackets can be crushed to produce inert granules that can be used as an inert additive, for example in road surfaces.
- pyrolysis: plastics are decomposed by heat, producing heavy oils that can be used as boiler fuel.

Tennis balls are made of rubber and fabrics whose mechanical and acoustic absorption properties can be reused in several ways, such as in acoustic or thermal insulation, shock absorbers, etc.

The use of herbicides for grass court maintenance is inadvisable. However, if they must be used, it is vital to avoid using prohibited molecules (consult the relevant regulations in the USA, Canada or the European Union, see



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bibliography) and organochlorate or organophosphate herbicides. Only degradable products that have recently come onto the market should be used. The dose suggested by the manufacturer offers a good indication of degradability: materials that require more than 800 g of the active ingredient per hectare (80 mg per m<sup>2</sup>) should be avoided.

### 4.5.3.5 Other aspects of tennis linked to sustainable development

Tennis is one of the most popular sports and is played by people of both sexes and all ages. It is also accessible to people with a motor disability, and wheelchair tennis is particularly popular and spectacular. For all these reasons, tennis can aid social integration, which contributes to sustainable development.



Figure 43: Wheelchair tennis is one of the most popular and widespread sports among disabled athletes (Paralympic Games, Athens 2004).

## 4.5.4 Archery

### 4.5.4.1 General

Archery is a sport of skill and concentration generally practised outdoors on archery fields. It is a traditional sport found in a large number of civilisations, with strong imagery which draws on a large number of myths and legendary heroes such as Cupid, Robin Hood, Ulysses and Legolas. It can also be practised on horseback. It requires equipment which can be either made by the archer himself, or highly sophisticated for top-level competition. At the Olympic Games, men's and women's archery is contested individually or in teams.

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### Some facts

- The appearance of archery is closely linked to the mastery of hunting by prehistoric humans. In Africa, stone arrowheads more than 20,000 years old have been found.
- In China, Confucius described the three principles of wisdom (Chi), benevolence (Jin) and courage (Yu). In wisdom, the Chinese system includes etiquette and its ethical values (Rei) to indicate how one should behave towards others. In this sense, the ceremonial used for archery in the Chinese aristocracy is regarded as the highest expression of refinement and good manners, as when shooting, the skill lies not in piercing but in striking the centre of the target, i.e. having the right movement thanks to the right mental attitude.
- Traditional archery in Japan is called Kyudo, which means « way of the bow ». Kyudo uses a very long bow (2.20m). The grip is located asymmetrically on the lower third of the bow to allow an archer to fire kneeling or on horseback.
- In the 13th century, Genghis Khan was able to build his vast empire thanks to the skill of his Mongolian riders, who sat high in their stirrups and were thus able to fire arrows in all directions.
- For the 1992 Olympic Games in Barcelona, the flame was lit by a burning arrow fired into the cauldron by a disabled archer.



Figure 44: Modern technology has taken nothing away from the traditional and symbolic image of archery: the beauty of the bow and the purity of the archer's technique.

#### 4.5.4.2 An environment-friendly approach to archery

Archery requires concentration and quiet, which implies an intact environment. However, the bow is also a weapon, which needs to be used with care and only for sporting purposes.

#### Rules of conduct for preserving the environment when practising archery

- Never use your bow outside the areas set aside for archery, nor with a view to killing or injuring;
- Use public transport or a bicycle, or travel on foot to and from the archery field;
- Consider, when possible, the use of products that conform to environmental and sustainable development criteria;
- Never leave behind at the field empty bottles, packaging or leftover food. Place these in the bins provided, or hold on to them and put them in the waste bin at home;
- Never leave behind at the field old clothes or accessories (bows, arrows, wrist slings, quivers, tabs, arm protectors, dress shields, etc.). Take these to a firm which can treat, recover or recycle solid waste.





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### 4.5.4.3 The impact of archery competitions and the necessary facilities

Archery competitions can have very little environmental impact provided that the archery fields blend well into the landscape and meet all safety requirements during events, and if all organisers and participants respect certain rules of conduct.

#### Responsibility of those involved in archery events

##### For the organisers

- The training area must be fenced off to make it impossible for the public or archers themselves to enter it by mistake, whilst ensuring visibility for the shooting areas. The field should preferably face north;
- Make known and ensure respect of the safety instructions displayed at the field;
- Avoid using toxic pesticides on the grass of the field;
- Access to targets, target lanes and firing points should allow the best possible access to archers in wheelchairs;
- Provide the public with an adequate number of well-maintained toilets and rubbish disposal facilities, to enable waste water to be treated and solid waste to be recycled or destroyed with no risk;
- Inform users of the rules of conduct to be followed: clean toilets, water saving and waste collection;
- Collect and ensure the proper destruction of, or pass on for recycling, the waste generated by the public and the equipment or accessories damaged or left by the athletes (bows, arrows, wrist slings, quivers, etc.).

##### For the participants and their entourage

- Set an example in terms of sporting fair play and respect for the environment. In and around the venue, do not drop rubbish such as food, bottles, packaging or damaged accessories like arrows, wrist slings, quivers, tabs, etc.).

##### For the public

- Whenever possible, use public transport or a bicycle, or travel on foot to and from the competition venue;
- Respect the rules of conduct with regard to the use of toilet facilities and waste disposal, particularly for packaging and empty bottles.

### 4.5.4.4 Special waste, toxic products and pollutants linked to archery

The special waste and toxic products to which attention should be paid essentially concern bows and their accessories, and maintenance of the grass area.

Bows are composed of two arm sections made of layers of fibreglass, carbon, ceramic, wood or foam stuck together. The string is made of either polyester (Dacron) or polyamide (Kevlar) fibres, or alternatively high-performance polyethylene (Fast-Flight). Arrows are usually made of carbon fibre and aluminium. Wooden bows which are no longer used can be burnt, or shredded and used for compost. For the others, the aluminium should be given to a company which recycles this, while the synthetic fibres can be disposed of by burning in special installations (turned directly into energy), shredding (turned into construction materials) or pyrolysis (turned into oil for burning).

Preference should be given to targets in recyclable or recycled materials. For the straw targets attention should be paid to the glue used to hold the straw rings together (avoid glues containing organic solvents) and the composition of the paints (which must be free of organochlorides, organic solvents and heavy metals).

If herbicides are used to maintain grass areas, they should be used cautiously. It is vital to avoid using prohibited molecules (consult the relevant regulations in the USA, Canada or the European Union, see bibliography). It is advisable only to use highly degradable products that have recently come on to the market.

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### 4.5.4.5 Other aspects of archery linked to sustainable development

Archery is a sport which, thanks to its legendary or historical figures, conveys a positive image of determination and justice, and can be particularly useful for building positive ethics in the education of young people. From building a bow to using it, the young archer can thus learn to master and take responsibility for all the parameters which will enable him or her to practise this sport, or more simply to identify with a legendary hero.

Archery is sport with a very long history and strong cultural values. Archers must bear these notions in mind if they are to appreciate and testify to the reality and importance of the idea of sustainability.

Archery is also a practice which unites many civilisations in all regions of the world, which have developed by using this method of hunting and this weapon. Still today, it constitutes a link between the pygmy in the forest of equatorial Africa and the athlete who practises the sport in a modern metropolis.

## 4.5.5 Shooting sport

### 4.5.5.1 General

In the Olympic Games, shooting sport, essentially an individual sport, includes 15 events, in rifle, pistol and shotgun, using fixed and moving targets. Shooting sport requires precision and rapid reflexes. The problems specific to this sport as regards the environment are those related to safety and pollution that may be produced during outdoor events by certain elements of the targets and by the lead used in the bullets and shot.

#### Some facts

- Shooting sport was a mixed Olympic sport until the Los Angeles Olympic Games in 1984, when separate women's and men's events were introduced.
- The auditory function is involved in shooting sport, not just for hearing itself, but because it plays a role in maintaining balance and verticality, by means of the posterior labyrinth.
- The lead used in bullets for shooting sport and hunting is thought to represent around 1% of the lead released into the global environment.
- The lead released into aquatic environments (ponds, estuaries) is more toxic than that which is released into the ground because it can become soluble (especially in acidic water with a pH below 7) and therefore accumulates in living organisms more easily.

### 4.5.5.2 An environment-friendly approach to shooting sport

The main requirements of an environment-friendly approach to shooting sport are an emphasis on safety and the need to avoid disturbing wild animals by using guns in natural settings, and to avoid contaminating the environment with bullets, shot or accessories.

#### Rules of conduct for preserving the environment for shooting sport

- Never use your guns outside the ranges or areas designated for this purpose, or with the purpose of killing, injuring or frightening;
- Be aware of the current legislation as regards guns;
- A gun should always be considered to be loaded and must never be aimed at yourself, another person, or any animals;
- Guns should always be transported in a proper case, unloaded and equipped with a mechanism that makes its immediate use impossible. Ammunition should be transported separately;



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- At home, guns should be kept in a safe location. Guns and ammunition that are subject to authorisation must be housed according to the regulations. Repairs and maintenance should be carried out in a safe location;
- Consider, when possible, the use of products that conform to environmental and sustainable development criteria;
- Use ear protection;
- Wherever possible, use lead-free bullets and targets without aromatic hydrocarbons;
- Never throw away empty bottles, packaging or leftover food in the shooting area. These objects should be disposed of in the bins provided for this purpose or taken back and put in the bin at home;
- Whenever possible, bullets, shot and clay targets should be recovered after events and given to a company that treats, recovers or recycles solid waste.

### 4.5.5.3 Impact of shooting sport competitions and the necessary facilities

During shooting competitions, special attention is paid to the recovery of bullets, cartridges and clay targets that could contaminate the environment.

#### Responsibility of those involved in shooting sport competitions

##### For the organisers

- Avoid installing outdoor shooting ranges near inhabited areas, in ecologically important sites as regards fauna (reproduction, migration zones, etc.) or near water, particularly if the water is acidic;
- Outdoor shooting ranges should be secured in such a way that accidental access to the public or other shooters is rendered impossible, while preserving maximum visibility in all shooting areas. The ranges should preferably face north;
- Post clearly and enforce safety instructions within the site;
- Avoid using toxic pesticides on grass areas;
- Provide sufficient toilet and waste collection facilities for the public. Ensure that they are well maintained and that they allow for the treatment of waste water and the safe recycling or destruction of solid waste;
- Inform users of the rules of conduct to be observed: keep the toilets clean, save water and collect rubbish;
- Collect waste left behind by the public and shooters and ensure it is properly destroyed or recycled;
- If lead bullets or shot and clay targets containing aromatic hydrocarbons are used, collect these items very carefully after events and give them to specialist companies.

##### For the shooters and their personnel

- Always observe exemplary behaviour in terms of safety, sportsmanship and respect of the environment (do not dispose of food, bottles or packaging within the range and help to recover bullets, cartridge and used targets).

##### For the public

- Whenever possible, use public transport or a bicycle, or travel on foot to and from the competition;
- Respect rules of behaviour regarding safety, the use of toilet facilities, and waste disposal, particularly packaging and empty bottles.

### 4.5.5.4 Special waste, toxic products and sources of pollution linked to shooting sport

The problem of contamination by nitrogenous compounds used in cartridges (trinitrophenols, trinitrotoluenes, etc.) is relevant only for outdoor events. When shooting ranges are to be transformed for other uses, the soil will need to be analysed and the site may need to be rehabilitated. In principle, indoor events take place using rifles and pistols that work by compressed air and do not cause any contamination; nevertheless, if cartridge rifles and pistols are used indoors, there must be good ventilation.

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Bullets and shot are made of lead, a metal whose toxicity is quite high. It is therefore important to ensure that this lead does not contaminate the environment. For this reason, methods for recovering bullets fired must be considered.

Several countries are already considering banning the use of lead shot. Lead substitutes (iron, zinc, tungsten composites, etc.) are particularly important for hunting which takes place in the natural environment, especially in humid areas. Apart from zinc, these alternatives are more expensive than lead.

Lead bullets and shot can be recovered in various ways:

- For rifle and pistol shooting, a “backstop” behind the targets can be used to collect the lead.
- Target boxes or electronic scoring targets in most cases have integrated bullet stops which collect the bullets.
- For shotguns, the shot can be collected by sheets or netting on the ground, vertical nets, adapted to the different firepower, or natural or artificial walls placed behind the targets.

Some “clay pigeons”, may contain polycyclic aromatic hydrocarbons (PAHs), which are carcinogenic. It is important to check that the targets used were made recently and are free of PAHs.

Finally, noise pollution must be attenuated by installing the shooting area away from inhabited zones or zones inhabited by fauna, or by installing noise-reducing walls.



Figure 45: Bullet interception barrier at a shooting range in Finland.

### 4.5.5.5 Other aspects of shooting sport linked to sustainable development

A few events in shooting sport simulate hunting. The sport can therefore play an important role in defending sustainable game management policies (creation of safe areas for reproduction, restriction of hunting during reproduction or migration periods, etc.).

## 4.5.6 Football

### 4.5.6.1 General

Football is undoubtedly the world’s most popular sport. While official competitions are held on grass or artificial surfaces in stadiums that meet well-defined criteria, most football pitches are informal pieces of land (fields, playgrounds, waste ground, etc.). Due to its popularity and universality, football has an important role to play in sustainable development through its extraordinary potential to bring solidarity and social advancement to groups and individuals.



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### Some facts

- The international association football federation (FIFA) currently has 207 member national associations from all over the world. Around 1,500,000 clubs have nearly 250 million players regularly participating in matches.
- The 2002 FIFA World Cup in Japan and Korea was watched by a cumulative TV audience of around 29 billion people.
- For the 2006 FIFA World Cup in Germany, the United Nations Environment Programme and host country Germany have signed an agreement ("Green Goal Initiative") to ensure that this event will be the first FIFA World Cup not to affect climate. The local organising committee will invest EUR 500,000 in the Tamil Nadu region of India, which was devastated by the 2004 tsunami. This project will consist mainly of the revegetation of the region, which should compensate for one-third of the 100,000 tonnes of greenhouse gases that will be generated by people travelling to and from the FIFA World Cup matches.
- Football is so popular that it is even used to report on environmental problems. For example, in order to raise awareness of how much of the Amazonian forest is being destroyed (23,130 km<sup>2</sup> per year), Greenpeace has compared it with the deforestation of a surface area equivalent to six football pitches per minute!

### 4.5.6.2 An environment-friendly approach to football

Competition football is usually played in clubs, while recreational football is a more informal activity amongst friends, neighbours, work colleagues, class mates, etc. In all these situations, ensuring that football is environment-friendly must be both an individual and a collective responsibility.

One particular aspect of the relationship between football and the environment concerns the pitch. Choosing the location for a football pitch can provide an opportunity to support the environment by renovating derelict land for this purpose. Finally, the club or team aspect of football can be used to promote conduct that supports sustainable development.

### Rules of conduct for preserving the environment for football

- Whenever possible, travel to the stadium or pitch by public transport, bicycle or on foot;
- Consider, when possible, the use of products that conform to environmental and sustainable development criteria;
- Never throw away empty bottles, packaging or food waste in the stadium, on the pitch or in the natural environment. Place them in the bins provided or take them away and dispose of them at the club or at home;
- Never leave behind worn-out or damaged equipment (boots, clothing, balls) in the stadium or in the natural environment. Give them to a company that treats, recovers or recycles solid waste;
- When creating a new football pitch, consideration should first be given to whether neglected land, such as waste ground, industrial wasteland, disused fields, etc. might be rehabilitated for this purpose;
- Negotiate the lease and management of this land with its owner and clean, maintain and if possible service it by installing basic toilet facilities and organising waste disposal;
- Take advantage of the club or team aspect to educate team mates and raise their awareness of the need to respect the environment and fair play and combat violence and racism;
- Ensure the club or team participates in environmental activities: Environment Day, cleaning of the district or town, tree-planting, etc. Failing this, take the initiative of promoting such activities.

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Figure 46: Informal football is an invaluable socialisation tool and can also provide an opportunity to rehabilitate neglected land (Tan Lap region in Southern Vietnam).

### 4.5.6.3 Impact of football competitions and the necessary facilities

Football events attract huge numbers of spectators, whether friends and family members watching a local match or the 100,000 or more who fill the terraces of the most prestigious stadiums. More than in any other sport, the impact of football competitions therefore depends as much on the attitude of spectators as on that of the organisers and players.

#### Responsibility of those involved in football competitions

##### For the organisers

- Promote and provide a convenient public transport system for travelling to the event;
- Preference should be given to day-time competitions if renewable energy is not available for lighting;
- In and around the stadium, offer the public an adequate number of toilet and waste collection facilities which are well maintained and allow for waste water to be treated and solid waste to be recycled or destroyed without risk to the environment;
- Inform users of the rules of conduct to be observed: keep the toilets clean, save water and collect rubbish;
- Prevent spectators from bringing into the stadium potentially hazardous items (firecrackers, flares, coloured foam sprays, etc.) which might cause suffocation, intoxication or fire;
- Prohibit the sale and bringing to the stadium of packaging and glass bottles that could cause injury if smashed or used as projectiles;
- Collect damaged or abandoned equipment or accessories and ensure they are properly destroyed or recycled (worn-out shirts or boots, balls, etc.);
- After the event, repair any part of the stadium or its surroundings that may have been damaged by spectators.

##### For the players and their entourage

- Behave impeccably in terms of fair play and respect for the environment (do not throw rubbish, such as water bottles or packaging, knee supports, compresses, etc. in the stadium);
- Avoid making unsporting, insulting or racist remarks during the match and in media interviews.



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### For the public

- Whenever possible, use public transport or a bicycle or travel on foot to and from competitions;
- Respect the rules of conduct on the use of the toilet facilities and disposing of rubbish, particularly packaging and empty bottles;
- Encourage the team by demonstrating fair play towards opponents and act as a peacemaker if there is any verbal or physical violence;
- Curb any demonstrations of racism.



Figure 47: Spectators as well as players and organisers have great responsibility for ensuring that matches are held in conformity with sustainable development.

#### *4.5.6.4 Special waste, toxic products and sources of pollution linked to football*

If herbicides are used to maintain grass football pitches, they should be used cautiously. Manual weeding is preferable if labour is inexpensive and unemployment levels high. As far as herbicides are concerned, it is vital to avoid using prohibited molecules (consult the relevant regulations in the USA, Canada or the European Union, see bibliography) and organochlorate or organophosphate herbicides.

It is advisable only to use degradable products that have recently come onto the market. The dose suggested by the manufacturer offers a good indication of degradability: products that require more than 800 g of the active ingredient per hectare (80 mg per m<sup>2</sup>) should be avoided.

#### *4.5.6.5 Other aspects of football linked to sustainable development*

Team sports such as football are invaluable socialisation tools which should be used to promote sustainable development. Due to its enormous popularity, football has great potential to bring together individuals and groups of people with different backgrounds, social standings, beliefs and cultures. This means that football has a specific role to play in promoting dialogue and understanding between these groups.

However, football must also combat the expressions of violence and racism, mainly amongst supporters, that tarnish its image. The football authorities are making great efforts in this area, but it is also the responsibility of players, managers and club officials, who must actively discourage this type of behaviour and use all available means to get the message across.

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The team aspect should be used to develop environmental and social activities which, if successful, can only benefit a team's performances on the pitch. Environmental protection activities carried out together can help to unite a group of people in a fun and useful way. Teams and clubs can also play a decisive role in sustainable development by providing socialisation and integration opportunities for disadvantaged or marginalised groups.

### 4.5.7. Baseball

#### 4.5.7.1 General

Inspired by British sports such as rounders and cricket, baseball originated in the United States during the second half of the 19th century. Although it is a team sport, it is made up of individual performances.

#### Some facts

- The national baseball league created in 1876 in the United States was the first professional league.
- The joint practice of baseball was one of the means to reunify the north and south of the United States after the civil war.
- Baseball contributed to overcoming racial barriers thanks to the performance of Jackie Robinson who, in 1947, was the first black player allowed into the professional league.
- Baseball became an Olympic sport on the programme at the Barcelona Games in 1992.

#### 4.5.7.2 An environment-friendly approach to baseball

Baseball is a sport in which official matches are held in stadiums but which, in regions where it is very popular, may also be played informally in all kinds of settings. In the latter situation, choosing a location for a baseball pitch can therefore provide an opportunity to support the environment by rehabilitating derelict land for this purpose.

#### Rules of conduct for preserving the environment for baseball

- Wherever possible, use public transport or a bicycle or travel on foot to and from stadiums and pitches;
- Consider when possible, the use of products that conform to environmental and sustainable development criteria;
- Never throw away empty bottles, packaging or food waste in the stadium, on the pitch or in the natural environment. Place them in the bins provided or take them away and dispose of them at the club or at home;
- Never leave behind worn-out or damaged equipment (balls, bats, gloves, helmets, shin guards, etc.) in the stadium or in the natural environment. Give them to a company that treats, recovers or recycles solid waste;
- When creating a new baseball pitch, consideration should first be given to whether neglected land, such as waste ground, industrial wasteland, disused fields, etc. might be renovated for this purpose;
- Negotiate the lease and management of this land with its owner and clean, maintain and if possible service it by installing basic toilet facilities and organising waste disposal;
- Ensure the club or team participates in environmental activities: Environment Day, cleaning of the district or town, tree-planting, etc. Failing this, take the initiative of promoting such activities.

#### 4.5.7.3 Impact of baseball competitions and the necessary facilities

In the numerous countries where this sport is popular, baseball competitions attract a large number of spectators. The impact of these competitions therefore depends as much on the attitude of spectators as on that of the organisers and players.





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### Responsibility of those involved in baseball competitions

#### For the organisers

- Promote and provide a convenient public transport system for travelling to the event;
- Preference should be given to day-time competitions if renewable energy is not available for lighting;
- If there is an adequate water supply, choose natural rather than artificial grass for the baseball pitch (or diamond), since the manufacture of artificial grass uses up non-renewable energy and resources;
- In and around the stadium, offer the public an adequate number of toilet and waste collection facilities which are well maintained and allow for waste water to be treated and solid waste to be recycled or destroyed without risk to the environment;
- Inform users of the rules of conduct to be observed: keep the toilets clean, save water and collect rubbish;
- Collect damaged or abandoned equipment or accessories and ensure they are properly destroyed or recycled (balls, bats, gloves, helmets, shin guards, etc.);
- After the event, repair any part of the stadium or its surroundings that may have been damaged by spectators.

#### For the players and their entourage

- Behave impeccably in terms of fair play and respect for the environment (do not discard rubbish, such as water bottles or packaging, accessories, etc. in the stadium);
- High-level players, coaches and club officials should avoid making aggressive, insulting or racist remarks during the match and in media interviews.

#### For the public

- Wherever possible, use public transport or a bicycle or travel on foot to and from competitions;
- Respect the rules of conduct on use of the toilet facilities and disposing of rubbish, particularly packaging and empty bottles.



Figure 48: If there is an adequate water supply, baseball pitches should be made of natural rather than artificial grass, the manufacture of which uses non-renewable energy and resources.

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### 4.5.7.4 Special waste, toxic products and sources of pollution linked to baseball

The baseball pitch (diamond) is made up either of grass and clay or artificial grass. If herbicides are used to maintain grass pitches, they should be used carefully. Manual weeding is preferable if labour is inexpensive and unemployment levels high. As far as herbicides are concerned, it is vital to avoid using prohibited molecules (consult the relevant regulations in the USA, Canada or the European Union, which may serve as a reference on this subject, see bibliography) and organochlorate or organophosphate herbicides. It is advisable only to use degradable products that have recently come onto the market. The dose suggested by the manufacturer offers a good indication of degradability: products that require more than 800 g of the active ingredient per hectare (80 mg per m<sup>2</sup>) should be avoided. Artificial grass should be destroyed or recycled by a specialist company. It should never be dumped in the natural environment, since it has a low level of degradability, nor burned, since it can produce toxic fumes. The same applies to accessories made of synthetic materials, such as helmets and shin guards. The aluminium in baseball bats should be recycled.

### 4.5.7.5 Other aspects of baseball linked to sustainable development

As in all team sports, the team aspect can be used to develop environmental and social activities which, if successful, can also benefit a team's performances on the pitch. Environmental protection activities carried out together can help to unite a group of people in a fun and useful way. Teams and clubs can also play a decisive role in sustainable development by providing socialisation and integration opportunities for disadvantaged or marginalised groups.

## 4.5.8 Hockey

### 4.5.8.1 General

Hockey is an Olympic sport for men and women, played on grass or, in high-level competitions, on a synthetic surface. At the Olympic Games, matches are played outdoors, although hockey can also be played indoors. The sport originated in England in the Middle Ages, and is the modern-day descendant of sports in which a stick was used to push a ball, sports that have been traced back to Mesopotamian civilisations that existed 2,000 years BC.

#### Some facts

- Competition between different sports! In medieval England, hockey had become so popular that it was banned for a while because it was taking people away from archery, an activity that was more beneficial in terms of the defence of the country;
- The rules of hockey have changed considerably over recent years, taking into account the fact that the game has become faster due to synthetic surfaces, the widespread use of resin on hockey sticks, as well as the need to improve the protection of players from accidental injury;
- After hockey was excluded from the Olympic Games in Paris in 1924, Frenchman Paul Léautey decided that an International Federation should be created in order to defend the sport at international level.

### 4.5.8.2 An environment-friendly approach to hockey

Hockey can be played without causing any environmental damage or pollution. Through a club's activities, it can even help to improve the environment.

#### Rules of conduct for preserving the environment for hockey

- Whenever possible, travel to competitions by public transport, bicycle or on foot;



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- Consider when possible, the use of products that conform to environmental and sustainable development criteria;
- Never throw away empty bottles, packaging or food waste in the stadium, on the pitch or in the natural environment. Place them in the bins provided or take them away and dispose of them at the club or at home;
- Never leave behind worn-out or damaged equipment (balls, sticks, gloves, helmets, shin guards, etc.) in the stadium or in the natural environment. Give them to a company that treats, recovers or recycles solid waste;
- Ensure the club or team participates in environmental activities: Environment Day, cleaning of the district or town, tree-planting, etc. Failing this, take the initiative of promoting such activities.

### 4.5.8.3 Impact of hockey competitions and the necessary facilities

The impact of hockey competitions on the environment can be negligible as long as spectators, organisers and players respect a number of simple rules.

#### Responsibility of those involved in hockey competitions

##### For the organisers

- Promote and provide a convenient public transport system for travelling to the event;
- Preference should be given to day-time competitions if renewable energy is not available for lighting;
- In and around the stadium, offer the public an adequate number of toilet and waste collection facilities which are well maintained and allow for waste water to be treated and solid waste to be recycled or destroyed without risk to the environment;
- Inform users of the rules of conduct to be observed: keep the toilets clean, save water and collect rubbish;
- Collect damaged or abandoned equipment or accessories and ensure they are properly destroyed or recycled (balls, sticks, gloves, helmets, shin guards, etc.).

##### For the players and their entourage

- Behave impeccably in terms of fair play and respect for the environment (do not discard rubbish, such as water bottles or packaging, accessories, etc. in the stadium);
- Avoid making aggressive, insulting or racist remarks during the match and in media interviews.

##### For the public

- Whenever possible, use public transport or a bicycle or travel on foot to and from competitions;
- Respect the rules of conduct on use of the toilet facilities and disposing of rubbish, particularly packaging and empty bottles.

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Figure 49: The synthetic surfaces used for high-level competitions have made the game quicker, but they need to be treated carefully when they are replaced.

### *4.5.8.4 Special waste, toxic products and sources of pollution linked to hockey*

In high-level competitions, hockey is played on a synthetic pitch. When these surfaces need to be replaced, they should be destroyed or recycled by a specialist company. They should certainly not be left in the natural environment, since they are made of a virtually non-degradable material, nor burned without special equipment fitted with smoke filters, since they can produce toxic fumes. The same applies to accessories made from synthetic materials, such as sticks (which used to be made of wood but are now made of carbon fibre, but not metal), helmets and shin guards.

### *4.5.8.5 Other aspects of hockey linked to sustainable development*

As in all team sports, the team aspect can be used to develop environmental and social activities which, if successful, can only benefit a team's performances on the pitch. Environmental protection activities carried out together can help to unite a group of people in a fun and useful way. Teams and clubs can also play a decisive role in sustainable development by providing socialisation and integration opportunities for disadvantaged or marginalised groups.

## 4.5.9 Modern pentathlon

### *4.5.9.1 General*

Modern pentathlon is a sport for men and women comprising five different events. Three are held in open-air stadiums: running (3,000 m), swimming (200 m freestyle) and riding (jumping), and two indoors: pistol shooting from 10 m and fencing (épée). Since the Atlanta Olympic Games, the competition has been completed in a single day, with the events in the following order: shooting, fencing, swimming, riding and, finally, running.



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### Some facts

- The modern pentathlon was devised and proposed by the founder of the modern Olympic Games, Baron Pierre de Coubertin. It first appeared on the Olympic programme in 1912.
- Pierre de Coubertin wished to create a modern sport devoted to the complete athlete, based on ancient pentathlon, to develop and demonstrate both his physical qualities and his mental resources.
- This sport simulates the challenges faced by a messenger who leaves on horseback. His horse is brought down in enemy territory; after defending himself with pistol and sword, he swims across a raging river and finally delivers the message on foot.

#### 4.5.9.2 An environment-friendly approach to modern pentathlon

Since modern pentathlon comprises a variety of disciplines, an environment-friendly approach to this sport involves paying close attention to its possible impact on different aspects of the environment: land, water and animals.

Rules of conduct for preserving the environment for the modern pentathlon

In order to preserve the environment, modern pentathletes must respect rules of conduct specific to the five disciplines concerned. Particular mention should be made of the riding event, before which the athlete only has a few minutes to get to know the horse. The athlete therefore needs a high level of understanding of the animal.

#### 4.5.9.3 Impact of modern pentathlon competitions and the necessary facilities

The environmental impact of modern pentathlon competitions and the necessary facilities can be considerably reduced if the different events are held close together, thus limiting the need to travel; if the additional pressure on the natural environment is kept to a minimum; and if existing infrastructures are used as much as possible for each of the disciplines.

### Responsibility of those involved in modern pentathlon competitions

*The Union Internationale de Pentathlon Moderne (UIPM) proposes the following measures to reduce the environmental impact of the modern pentathlon:*

- Participants should be able to walk between the different event venues;
- The running event, which used to take place in the natural environment, should be held in an athletics stadium or on roads;
- The shooting event, which used to be held outdoors, now uses air pistols with small targets, which means it can be held in the same hall as the fencing event.

The responsibility of the different groups of people involved in modern pentathlon events (organisers, athletes and the public) depends on the specific recommendations related to each of the disciplines involved.

Furthermore, if the facilities are used for these other disciplines, the organisers, coaches and athletes should help their colleagues with the task of preserving the environment and ensuring the facilities can be used in a sustainable way.

#### 4.5.9.4 Special waste, toxic products and sources of pollution linked to the modern pentathlon

Please refer to the relevant chapters for each of the disciplines involved.

#### 4.5.9.5 Other aspects of the modern pentathlon linked to sustainable development

Because of the diversity of the disciplines involved, modern pentathlon can particularly contribute to the balanced

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development of young people, as well as a recreational approach to different elements of the natural environment, such as water and animals. In order to facilitate this and to make the sport accessible to the most disadvantaged groups, the UIPM has created "Biathle", a continuous running-swimming-running event that does not require any special equipment (clothing, shoes or timing devices).

### 4.5.10 Triathlon

#### 4.5.10.1 General

Triathlon is an endurance sport for men and women, comprising three consecutive events: swimming (1,500 m), cycling (40 km) and running (10 km). It has been part of the Olympic Games programme since Sydney 2000. There are other variations of triathlon: the winter triathlon, the duathlon (cycling and running) and the aquathlon (running and swimming).

#### Some facts

- The triathlon originated in California in the early 1970s as a result of the jogging craze among urban populations.
- The 1904 Olympic Games included an event called the triathlon, which comprised the long jump, shot put and running.

#### 4.5.10.2 An environment-friendly approach to the triathlon

On account of the diversity of the disciplines concerned, an environment-friendly approach to the triathlon involves paying attention to its possible impact on the aquatic and terrestrial environments.

#### Rules of conduct for preserving the environment for the triathlon

An environment-friendly approach to the triathlon involves respecting the rules of conduct specific to the three disciplines concerned.

#### 4.5.10.3 Impact of triathlon competitions and the necessary facilities

The environmental impact of triathlon competitions and the necessary facilities can be considerably reduced if the events are kept close together geographically in order to minimise travel and if the presence of the public at the different competition sites is well managed.

#### Responsibility of the organisers, athletes and public during triathlon events

The responsibility of the different people involved in triathlon competitions depends on the specific recommendations for each of the disciplines involved.

Furthermore:

- members of the public should be able to walk between the different sites;
- there should be an adequate number of water supply points, portable toilets and bins at all the event sites and on the routes between them.

#### 4.5.10.4 Special waste, toxic products and sources of pollution linked to triathlon

Please refer to the corresponding chapters on each of the disciplines involved.

#### 4.5.10.5 Other aspects of the triathlon linked to sustainable development

The triathlon combines all the aspects of sustainable development present in the disciplines concerned.

