

MANUAL
ON
SPORT
AND THE
ENVIRONMENT



International Olympic Committee

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*Department of International
Cooperation and
Development*

FOREWORD

Over the last decade, the International Olympic Committee (IOC) has seen in itself a particular responsibility to promote sustainable development. Today, the environment is the third dimension of the Olympic Movement, alongside sport and culture.

It is in this spirit that for 10 years the Sport and Environment Commission, chaired by Pál Schmitt, has worked, and has, in close partnership with the United Nations Environment Programme (UNEP), organised awareness-raising and educational campaigns for members of the Olympic Family and athletes in general on the importance of a clean environment and sustainable development, enabling them to improve their quality of life without comprising that of future generations.

Olympic Games which respect the environment and the principles of sustainable development: such is the other objective of the IOC and the Olympic Movement. It is very important that, going beyond their organisation, the Olympic Games leave a green legacy to the host country. Due concern for environmental aspects is thus a prerequisite for any candidature to host the Olympic Games.

The IOC undertakes to ensure that the Olympic Games take place in conditions which demonstrate a responsible attitude towards the environment. It is also necessary that all parties linked to the Olympic Movement place the appropriate importance on sustainable development.

The Olympic Movement must deepen its knowledge of the environment so that it can undertake concrete actions leading to enhanced nature protection. We must prepare our strategies from a realistic standpoint and call for the cooperation of all partners likely to provide expertise and additional support, taking fully into account specific circumstances and available means.

This Manuel on Sport and Environment will be without doubt a useful tool to better learn and identify the environmental issues related to the practice of sport and thus to continue placing sport everywhere at the service of the harmonious development of humanity and our environment, and thereby contribute to our well-being.

Give the planet a sporting chance!

*Jacques Rogge
President of the
International Olympic Committee*

INTRODUCTION

Environmental issues are becoming a general concern all over the world, as they affect the daily lives of each and every one of us. Admittedly, the concept of environment is not new; moreover, it is deeply related to each specific culture and its relationship with nature. Nonetheless, numerous major international conferences and countless scientific research projects have, over the past few decades, underscored the urgent need to address these issues on the basis of a coherent and world-wide approach, and urged the different players of society to adopt concrete measures to reduce their negative impacts on the environment, thereby ensuring the well-being of present and future generations.

Sport, as recreational and physical education activities, is nowadays a major component of society. It gathers under its umbrella millions of adepts world-wide and constitutes, through its clubs, associations and other organizations, a major and well-structured network in our society. But as one of many human activities, it also impinges on the environment. Given that global environmental problems are deeply rooted in local environmental conditions and behavior, the interaction of the sports community with the environment in which its activities are performed must be carefully analysed, and ways to improve it must be sought, to the benefit of all. Indeed, the concepts of sport and environment are fully interdependent and need to be addressed simultaneously.

The Olympic Movement, as the movement encompassing sports organizations, athletes and other persons who agree to be guided by the Olympic Charter, has a direct and concrete role to play in the field of environmental protection. Olympism is a philosophy which places sport at the service of the harmonious development of men and women, and contributes to building a better world by educating youth through sport. In this sense, a healthy global and local environment is a natural partner of the Olympic ideals and the promotion of Olympism. Environment fully deserves to be considered as the third pillar of Olympism, after sport and culture. The Olympic Movement has therefore the responsibility of addressing environmental issues and integrating its actions within the framework of sustainable development.

The International Olympic Committee (IOC), as the coordinator of the Olympic Movement, is convinced that it has to assume a leading position in this field. Its goals are two-fold. First, and more specifically, the IOC ensures that the Olympic Games are held in conditions which demonstrate a responsible concern for environmental issues. In this respect, we are pleased to observe that major efforts have been accomplished with the cooperation of the Organizing Committees. Second, and on a more global scale, the IOC wishes to promote an educational programme among the members of the Olympic family advocating environmentally sound practices and turning environmental challenges into new opportunities to associate the sports community to sustainable development. Hence, our action during the Games of the XXV Olympiad in Barcelona, where all the International Federations and National Olympic Committees signed the Earth Pledge and thereby committed themselves to contributing towards making the Earth a safe place. It is also in this context that the IOC decided to establish cooperative links with the United Nations Environmental Programme (UNEP), the leading international institution in the field of environment, with which we have undertaken several joint initiatives. The former IOC President, Juan Antonio Samaranch, who launched the sport and environment issue, further

reinforced this trend by creating a Sport and Environment Commission, which I have the privilege to chair, together with a special section in the administration responsible for the implementation and follow-up of all IOC environmental actions. Through a genuine awareness-building process and the setting up of an appropriate working structure, the IOC has given itself the basis for the definition and implementation of its environmental policies.

Such is the framework in which this Manual on Sport and the Environment was prepared, for use by all the members of the Olympic Movement, from the largest and most developed entities to the smallest organizations, all the way down to the individual level. It is designed for a public which is not necessarily equipped with a specific expertise in environmental issues, and aims to provide basic tools to identify problem areas, establish priorities and find appropriate responses to issues stemming from the relationship between sport and the environment. This being said, by no means do the recommendations included in this Manual purport to be the panacea. Cultural, historical, geographical, political and economic specificities all have to be considered, as they impinge significantly on the nature and extent of any environmental measure which may be undertaken.

The contribution of the Olympic Movement and of its numerous volunteers must be complementary, the basic responsibility to protect the environment lying with governments. Nevertheless, we are firmly convinced that much can be done with limited means. Each step taken to harmonize the development of sport with its environment can, in the long term, make a real difference to the cause of sustainability.

*Dr. Pál Schmitt
Chairman
IOC Sport and
Environment Commission*

CHAPTER I: KEY CONCEPTS AND ISSUES CONCERNING SPORT AND THE ENVIRONMENT

The environment is everything that surrounds an organism or organisms, including both natural and human-built elements. Human beings, as all the other species that form the global ecosystem, have always interacted with their environment and, in the process, shaped it to some extent. However, human beings are the only species able to affect the ecosystems considerably. Since ancient times, the use of fire has altered flora and fauna, farmers have cut forests and domesticated certain species of animals, and early civilizations have transformed deserts through irrigation.

Today, the Earth itself is undergoing a global transformation. Rapid population growth combined with the development of fossil fuel-based industrialized societies has dramatically accelerated the impact on the environment. Climate change, the global destruction or pollution of ecosystems and other environmental problems are closely linked to our attitudes and practices. This also applies to sports activities. Like any other human activity, sport is set in a physical environment and has effects on it.

The practice of sport includes activities at different levels. It ranges from persons who occasionally engage in sports activities and physical education to elite athletes, from small clubs to International Federations, from local competitions to championships and large scale events such as the Olympic Games. The practice of sport implies, to a varying degree, a structured organization, sports facilities and equipment, logistics and sponsors, media, and athletes of course, i.e. persons who practice a sport more or less intensively.

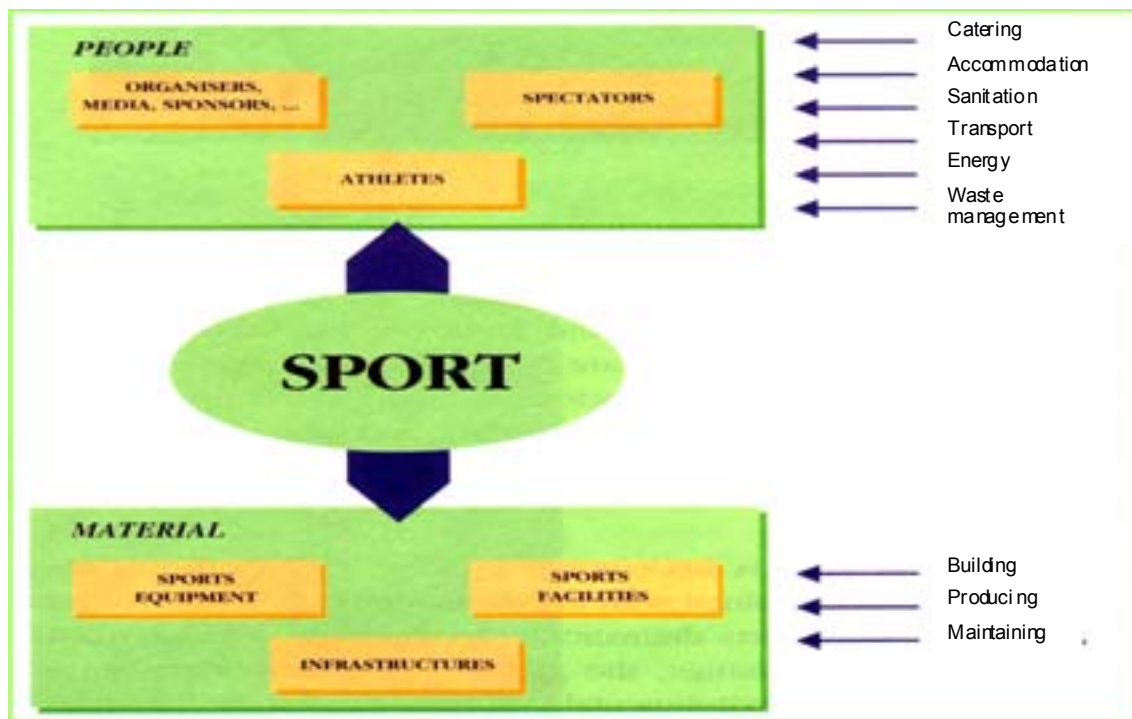


Figure 1: Activities and needs created by sports events

Potentially, sport can generate various impacts on the ecosystems, from insignificant repercussions to major damage. The scale and gravity of impact depends mainly on the kind of sport and the size of the event. The following types of impact generated by sports events should be considered:

a) short-term impacts

Short-term impacts occur during the event, e.g. noise or local air pollution due to a specific event are short-term impacts.

b) long-term impacts

Long-term impacts continue to exist after the end of an event; they can be due to facilities or infrastructures that remain. Soil deterioration (long-term pollution or soil packing) are also long-term impacts.

c) direct impacts

Direct impacts are caused by facilities and people directly involved in the event.

d) indirect impacts

Indirect impacts are due to new infrastructures built for the event but not directly related to the sports activity (e.g. new roads, new bridges).

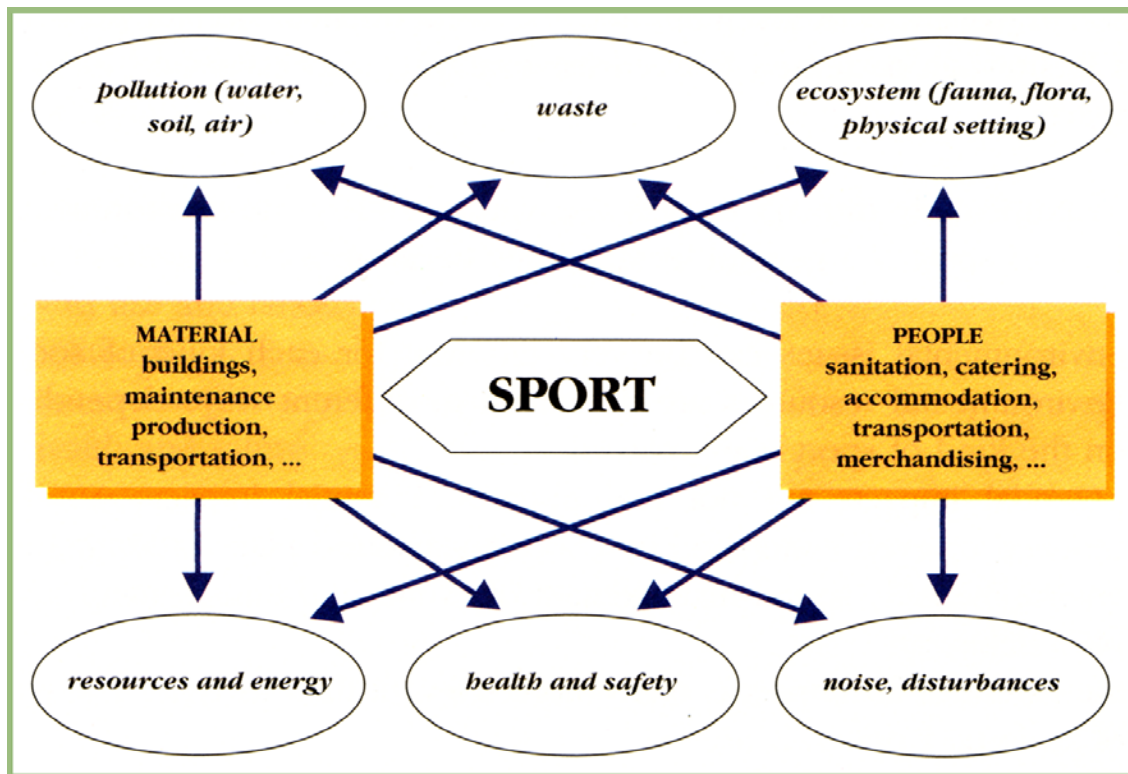


Figure 2: Potential impact of sport events on the environment

The attractiveness of a region, and the consequential human pressure on it, through increased tourism for example, also constitute indirect impacts.

It is particularly difficult to describe with accuracy the environmental effects of sport at a general level, mainly because:

- environmental issues can be very different for each kind of sport. Environmental resources are drawn on in different ways depending on the kind of sport being played;
- potential impacts are not real impacts. Potential impacts can be reduced or even eliminated by choosing a sound place, adopting an environmentally sound management of events and transforming people's behavior;
- the extent of an impact is often more relevant than its type. The size of an impact depends on:
 - how intensively the sports place is used
 - how sensitive the natural setting is

However, three kinds of impacts are especially relevant in regard to sports events:

- high concentration of people in a short time and in a limited place
- increase of sports activities in time and place (where previously there was little or nothing)
- indirect effects due to the sport, often similar to those due to tourism

Public attention has been focused on environmental problems generated by large-scale events like the Olympic Games, but little attention is paid to other sports activities and events which are practised regularly and concern a majority of people. Impacts of big events are more visible and more important, but daily practices may also have negative



effects on the environment through the large number of people they involve.

Sport may be related to tourism in the way that sports events and facilities (infrastructures, trails, natural setting, etc.) constitute a tourist attraction. Although the environmental effects of tourism can be significant, they are not taken up in the present Manual.

We have identified below a series of environmental issues which may have to be addressed, whether when engaging in a sports activity or organizing a sports event:

- biodiversity conservation
- protection of ecosystems
- land use and landscape
- pollution
- resource and waste management
- health and safety
- nuisances
- safeguard of cultural heritage

1.1 BIODIVERSITY CONSERVATION

Biodiversity is the variety of all life, wild and domesticated, at every level. It encompasses the Earth's 10 million species of plants, animals and other organisms. Biodiversity must be preserved for several reasons:

- as a matter of principle (all species have the right to exist)
- as a matter of survival (the Earth's ability to sustain life depends on the variety of life)
- as a matter of economics (biodiversity is the source of all biological wealth which provides foods, drugs/medications, goods and services)

Biodiversity is threatened primarily by the extension of human activities which destroy and degrade the habitat of many species, but other factors like pollution and over-harvesting play a significant role as well. Sports facilities and the practice of sport as a human activity can directly and indirectly contribute to the perturbation of ecosystems, including their natural resources and biodiversity.

Although the impact of sport on biodiversity is not examined in this Manual, the impacts described in the sub-sections devoted to ecosystems and pollution represent a global threat to biodiversity.

1.2 PROTECTION OF ECOSYSTEMS

An ecosystem is a dynamic and complex system of plant, animal and micro-organism communities, and their non-living environment, all interacting as a functional unit within a defined physical location. All members of the global ecosystem (the Earth) are interdependent and affect one another.

The concept of an ecosystem is important because it conveys one of the key insights gained from the science of ecology: everything is related to and interconnected with everything else. Given that no individual part of the global ecosystem exists independently from the others, none can be affected without affecting the others. Ecosystems change over time, but this change is natural and occurs in certain recognizable, repeated patterns. The composition of species of trees in forests, for example, will change over time in a relatively predictable way.

The evolution from natural systems to constructed systems constitutes a change from self-regulation to regulation by humans, a decline in native biodiversity and a rise in introduced biodiversity. When sports activities take place in an ecosystem, they can introduce people, sports facilities and infrastructures. The impact is therefore greater if the ecosystem is at a natural stage or has been only slightly impinged on by human beings (Figure 3).

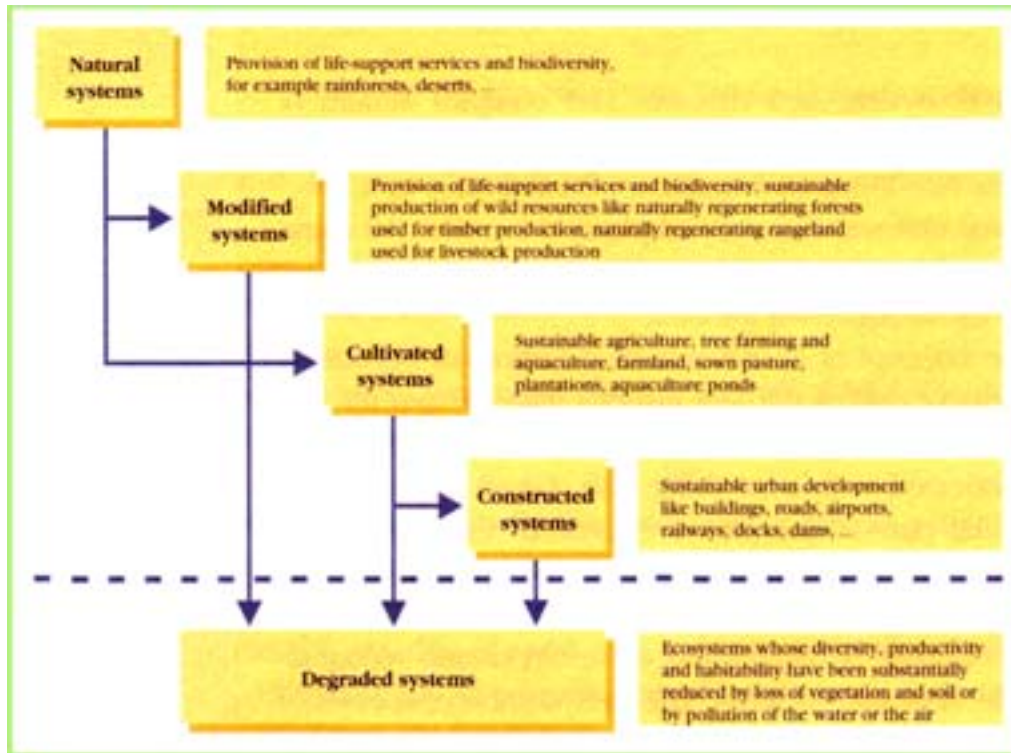


Figure 3: Classification of ecosystem conditions (adapted from "Caring for the world")

Sports activities can be classified by the type of ecosystem in which they take place and by their impact on it:

1) Activities in constructed ecosystems (outdoor and indoor)

Refers to sports practised in totally closed and artificial places like stadia, indoor tennis courts, sports halls or swimming pools. In urban areas, these facilities are a source of nuisances and can generate environmental problems similar to other urban activities (waste, wastewater, energy). In non-urban areas, the main problem is the loss of a more or less natural ecosystem and its substitution by an artificial one.

2) Low-impact activities in natural ecosystems (mountain bike, equestrian, water sports)

Refers to sports practised in a natural setting and which do not require a substantial modification of the ecosystem. In this case, the impact is caused more by the high concentration of sportsmen and sportswomen whose behavior is not always environmentally friendly.

3) High-impact activities in natural ecosystems (alpine ski trails, bobsleigh)

Refers to sports practised in a natural setting and which require a substantial modification and/or destruction of the ecosystem. Facilities and users cause extensive damage to the whole ecosystem.

The different parts of the ecosystem which may be affected are:

- flora
- fauna
- physical surroundings (water courses, topography, etc.)

Destruction or modification of the ecosystem or of part of it:

- building ski trails (deforestation, modifying the lie of the slopes)
- modifying water courses
- deforestation
- parceling out territories of animals by building obstacles
- packing of soil
- soil erosion
- loss of soil stability

Location of sports facilities in / or near conservation areas

- higher human pressure due to improved accessibility (new buildings and roads)

Disturbing fauna and flora (loss of biodiversity)

- noise of engines during the building of sports facilities
- destruction or modification of natural ecosystems serving as animal habitats (water systems, forests, hedges, etc.)
- human interference

1.3 LAND USE AND LANDSCAPE

Land is the place where all activities are performed: a place to live, to work, to produce food and other goods, a place to rest and also to practise sport. Land is a rare and precious resource and it is shared between different uses and users. In some parts of the world, arable land is especially sought after. Moreover, land is the collecting surface for underground water resources.

Landscape is the natural setting. Large facilities implying a general transformation can harm its aesthetic value. The choice of location of sports facilities, especially for large scale constructions with annexes like parking places and access roads, is a sensitive step in the planning and building processes. Inappropriate choices can lead to environmental, economic and social problems.

Land use

- land occupation
- loss of farm land
- building new roads or enlarging old ones
- waste of land through unsound planning

Landscape modification

- visual impact (destruction of an aesthetically appealing landscape)
- loss of the characteristic aspect of settings
- large facilities harming the landscape (ski or bobsleigh trails, etc.)
- large-scale modification of an entire region implying the transformation of the prior economic, social and ecological situation (new roads, large-scale infrastructures, new water management, loss of agricultural potential)

1.4 POLLUTION

Pollution is defined as the presence of hazardous gases, particles and solid and/or liquid substances, or of excessive amounts of normal constituents in the atmosphere, water and land bodies. Pollution may impinge on economic activities, degrade ecosystems including their natural resources, harm human health and destroy aesthetic values of landscape.

Pollutants travel relatively easily through the different parts of the ecosystem. Washing out from soil into the groundwater, air deposition over soils and waters, runoff from roads into rivers are some of the processes which contribute to global contamination. Once in the environment, pollutants are absorbed by plants, animals and finally humans, and endanger the health of these organisms.

Sport is a human activity which produces waste (domestic and hazardous), uses substances, and could be a potential polluter. Some sports facilities may contain toxic substances like coding agents or chlorine (e.g. in swimming pools).

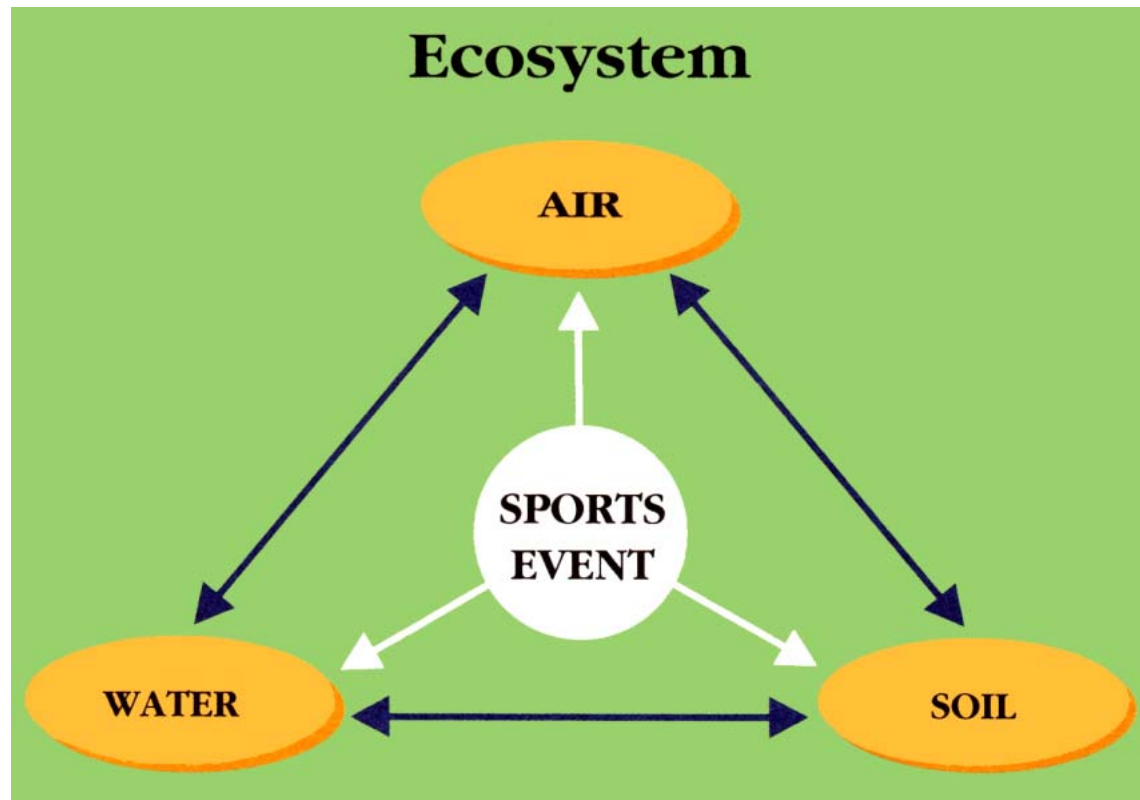


Figure 4: Pollutants are emitted in the air, water and soil

Water (groundwater and surface water are potential resources of drinking water)

- untreated wastewater flowing into lakes, rivers and oceans
- groundwater pollution through the runoff of fertilizers and pesticides used in sports facilities, maintenance (e.g. sports fields)
- direct release of toxic substances

Air

- emission of gas from transportation (building facilities, traveling to sports facilities)
- other emissions from facilities

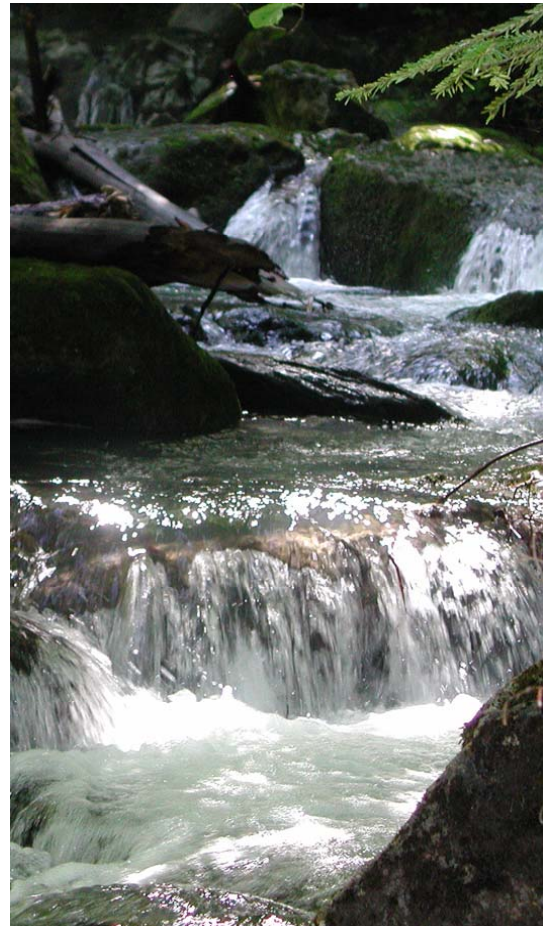
Soil

- pollution of soil due to agrochemicals used to treat grassland for playing fields
- contamination of soil through hazardous waste (industry, building)

1.5 RESOURCE AND WASTE MANAGEMENT

Resources encompass all the elements, goods and energy used to meet the needs of people and to enable the infrastructures to be built and maintained. Waste is all the materials for which there is no further use in the event and which need to be disposed of. Therefore, resources may be compared to an incoming flow allowing an event to live, whereas waste is the event's outgoing flow. Resources and waste are closely intertwined, given that the use of resources almost always generate waste which has to be treated or disposed of.

Unsound exploitation of resources has greatly contributed to the current ecological problems of the world. The amount of energy and raw materials used by each person rises constantly and leads to a drop in available resources and an increase in waste. Resources are either "renewable" or "non-renewable".



- **Renewable resources** are unlimited and may be exploited without exhausting their stock, which returns to its previous level by natural processes such as growth or replenishment. Water, timber, solar energy, fishery are some natural renewable resources. These resources are renewable on the condition of sustainable exploitation not exceeding the self-regeneration capacity. Over-fishing or the clear cutting of tropical forests do not allow a regeneration and lead to the exhaustion of those resources.
- **Non-renewable resources** such as fossil fuels and metal ores exist in limited quantities and are unable to be regenerated after exploitation. Their over-exploitation therefore leads to their exhaustion in the short or long term. Many non-renewable resources are located in the Earth's crust and are thus isolated from ecosystems. Their exploitation (extraction, transformation processes, transport,

use and disposal) leads to the emission of substances foreign to the biosphere, which are often harmful to living organisms (such as heavy metals or fossil fuel gasses). Many of these toxic substances are released through waste treatment or disposal.

Ever-greater amounts of wastes are generated by human communities and their management is a formidable challenge for public authorities. The impacts of the different kinds of wastes - domestic, industrial or even hazardous - vary greatly in magnitude. Certain types of waste create little more than unpleasantness (smell, dirtiness), while others are highly toxic.

Sports events also draw on resources, which are either renewable or non-renewable, and produce waste. The quantity of resources used and the consequential amount of waste to be collected, transported and treated or disposed of, depends mainly on the size of the event. Resources are needed in the following activities:

- catering (food, drinks), accommodation, water supply and sanitation
- managing the event (especially water and energy use)
- building and maintaining the facilities
- transportation of people and goods (energy use)

Different kinds of waste are produced, sometimes in great quantities:

- domestic waste from the event itself (programmes or merchandising products), from catering (e.g. disposable cups) or from accommodation
- industrial or hazardous waste from specific activities (e.g. products used in maintenance and transport activities) which needs particular treatment

Problems related to resource and waste in sports events

- excessive water use in comparison with the quantity of water available (which drains resources)
- energy produced with non-renewable resources (coal, fuel, etc.)
- transport using fossil fuels
- excessive quantities of waste (hazardous and domestic) which local waste management services are unable to collect, transport and treat properly
- toxic waste specific to a sport or a facility and whose inappropriate treatment generates pollution

1.6 HEALTH AND SAFETY

Environmental hazards can lead to a wide range of health effects. These may vary in type, intensity and magnitude depending on the type of hazards to which people have been exposed, their level of exposure and the number of people affected. For many people, sport is closely related to the environment in which it is practised. Being in nature contributes very often to the pleasure and well-being that people feel when practising sport.

In an ecologically degraded area, it may be difficult, if not impossible, to practise certain sports. An unhealthy environment not only hurts the athlete but also hinders the motivation of individuals to practise sport in the first place. Outdoor sports training

is affected if the quality of the area is poor, e.g. jogging in smog-polluted cities or canoeing in bacteriologically unsafe water.

Potential sources of health problems

- lack of access to safe-drinking water and poor quality of drinking water
- lack of basic sanitation
- poor air quality (airborne smog, indoor air quality, high ozone concentration, etc.)
- water sports in dirty water (pollutants, bacteria, toxic chemicals, pesticides, etc.)
- sport in contaminated areas (e.g. through toxic wastes, pesticide residues or heavy metals)
- sports facilities dangerous for population (such as ski trails that may cause avalanches because of deforestation, or use of substances harmful to humans, such as cooling agents or pesticides to maintain the facilities) and sports facilities with poor maintenance conditions
- global change and contamination affecting the entire ecosphere, making the practise of sport uncomfortable if not impossible (ozone layer depletion, climate change, habitat/biodiversity loss, radioactive contamination, accumulation of toxins, soil and water contamination, acid rain)
- noise pollution during sports events (can cause stress to population)

1.7 NUISANCES

Nuisances are not environmental impacts in themselves, but rather a threat to the quality of community life. However, they may affect the fauna in some cases. Nuisances are mainly noise disturbances, but vibrations and other types of nuisance may also occur.

Sport may generate nuisances that can become unbearable for the neighbouring community or ecosystems. These nuisances can occur either on a continuous or occasional basis.

Potential sources of nuisances

- noise and traffic during the construction phase of sports facilities
- noise and traffic due to the organization of large-scale sports events
- noise and pollution due to public celebrations after sports events
- noise due to the use of sports facilities located in inhabited areas (tennis, basketball)
- flood lights of sports facilities (disturbing birds)

1.8 SAFEGUARD OF CULTURAL HERITAGE

Local communities have a vital role to play in environmental management and development because of their particular knowledge and traditional practices. Their identity, culture and interests should be recognized and should not prevent them from participating in the achievement of sustainable development.

Similarly, when organizing a sports event or building sports facilities, this aspect must be taken into account. Efforts must thus be made to protect and enhance significant

features of the natural environment and the cultural heritage of a designated area.

It is indeed fundamental that sport be fully integrated into the local culture, and that it maintain a social profile moulded on the participation of the surrounding community, inclusive of environmental organizations, local residents and underprivileged groups. Their values, traditional knowledge and resource management practices should be recognized and integrated. Specific attention should also be paid to protected areas, historical monuments and other traditional aspects.

Cultural heritage

- goods and resources (monuments, local products, arts and crafts, natural resources)
- traditional know-how (use and management of local resources)
- social aspects (local community, cultural values and practices, traditional events and sports)

CHAPTER II: ENVIRONMENTAL RECOMMENDATIONS

Having reviewed, in the previous chapter, the environmental issues which need to be addressed by the Olympic Movement in regard to sports activities, this chapter identifies a list of recommendations and basic suggestions which the sports community may wish to implement, adapting them to its local circumstances and environment. Throughout the whole process of preparation and implementation of an environmental programme or policy, it is important to remember that each particular situation will require its own set of measures, which will be determined by geographical factors, the nature and extent of the problem, the access to additional resources and the specificity of the local population and organizations. However, let us remember also that, even when resources are limited, many environmentally sound measures may be taken which will make a real difference towards attaining sustainable development.

2.1 GENERAL RESPONSIBILITY: INTERNATIONAL LEGISLATION ON THE ENVIRONMENT

Most countries have enacted specific legislation on this issue, which must be complied with. Although governments have the basic responsibility to implement these sets of environmental rules and comply with them, the sports movement should also be concerned by such issues. The planning of a sports event or the building of a sports facility also need to respect rules and regulations in the field of environmental protection.

Local, regional or national legislation in this area are the result of a long process of consultation and discussion at governmental level. The concept of environmental protection was developed in 1972 when 113 governments convened in Stockholm for the United Nations Conference on the Human Environment. For the first time, representatives of world governments gathered to consider the implications of a deepening environmental crisis. At the end of the Stockholm Conference, a consensus was reached on a document that established the basis for a new era of international cooperation. The Declaration and Action Plan proposed the first global agenda for the environment, with 109 recommendations for national and international actions and more than 150 separate proposals. They provided the foundation for the development of international environmental law during the 1970s and 1980s and also led to the establishment of the United Nations Environment Programme which has become the global instrument for carrying out the consensus measures outlined in the agreements.

After Stockholm, more than 100 governments set up environmental ministries and agencies entrusted with the implementation of environmental regulations. The Stockholm Conference also led to the establishment of the World Commission on Environment and Development, known as the Brundtland Commission after its chairperson, Gro Harlem Brundtland, Prime Minister of Norway. The Commission's report, *Our Common Future*, called a global conference on environment and development known as the United Nations Conference on Environment and Development, or Earth Summit, which was organized in June 1992 in Rio de Janeiro, Brazil.

During this second conference, 184 governments convened at the highest political level to address the concerns of sustainability, and the relationship between environment and economic development. As a result, governments produced a prescription for survival in the form of an 800 page document entitled Agenda 21, so called for its projection that all of its recommendations should be met by the beginning of the 21st Century. Agenda 21 deals extensively with actions that governments, international organizations, industry and the community at large can take to achieve lasting changes with regard to human economic development. These actions recognize the impacts of human behavior on the environment and on the sustainability of production systems. The Earth Summit also produced two legally binding conventions on biodiversity and climate change, a set of forest principles which may form the basis for a forestry convention, and the Rio Declaration.

In 1997, world leaders met in New York, United States, at a special session of the United Nations General Assembly to review progress and appraise Agenda 21. Despite improvements on many fronts, the final report highlighted that much needed to be done to deal with an increasingly degraded planet.

Some conventions that currently concern the environment are:

- [Convention to Combat Desertification](#)
- [Convention on Climate Change](#)
- [Basel Convention on the Transport of Hazardous Waste](#)
- [Convention on Biological Diversity; the Convention on the Law of the Sea](#)
- [Montreal Protocol on Substances that Deplete the Ozone Layer](#)
- [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#)
- [Convention on Wetlands of international Importance, especially as Waterfowl Habitat \(Ramsar\)](#)
- [Stockholm Convention on Persistent Organic Pollutants \(POPs\)](#)
- [Kyoto Protocol on climate change.](#)



All the different international agreements and conventions which have been adopted can therefore provide a foundation for the establishment of an environmental programme of action in any section of the community, such as the sports movement for instance. Part of each community's work for the environment could be to find out what these agreements are, and to cooperate with governments, local or regional

authorities to comply with them. It is important to note that some of these agreements - such as the Programmes of Action, Declarations and Agendas adopted at many United Nations Conferences - are not legally binding as such. However, these documents have political authority and may serve as a useful reference to know what governments have agreed to. On the other hand, legal conventions which have been ratified by governments become international law, and all the countries who have ratified such conventions are legally bound to adhere to their principles.

2.2 LOCAL, REGIONAL AND NATIONAL LEGISLATION

The ability of a country to follow sustainable development paths is determined, to a large extent, by the capacity of its people and institutions, as well as by its ecological and geographical conditions. However, in order to develop greater sustainability, the ability to evaluate and address crucial questions related to policy choices and implementation of development options should be based on an understanding of environmental potentials and limitations, and of peoples' needs.



Most countries are gradually adopting environmental legislation containing laws and regulations which mirror the global principles of sustainable development. Environmental law discusses the procedures that have to be adopted prior to the realization of certain projects, or the introduction of specific new products to the market.

The new laws also include the general public information process and the right to bring proceedings against companies or people who damage the environment. In this sense, all such laws and regulations also have to be followed in the planning and construction phases of sports infrastructures, or the organization of a sports event, with a view to ensuring that, at the very least, minimum environmental requirements are fulfilled. Where possible, it is advisable to go further than minimum legal national requirements by promoting more specific environmental programmes.

2.3 INDIVIDUAL AND COLLECTIVE RESPONSIBILITIES: TRANSFORMING ATTITUDES AND PRACTICES

2.3.1 "Think globally - Act locally"

The human population's growth has put major pressure on the environment, whose resources are limited, renewable under specific conditions but usually non-renewable. The impact on the environment has grown in scale, become more rapid and changed in character, affecting not only small regions, but also transforming the

Earth itself on a global scale. Changes which once occurred over decades or centuries are now taking place within a few years and are often changing the fundamental elements of the planet's life-support systems. As a result, it is necessary to adopt a completely new approach and establish a coherent relationship with our environment. When practising sport, our approach has to take this aspect into consideration.

Agenda 21 recognizes that the commitment and involvement of all social groups, community-based organizations and individuals is critical to the effective implementation of the objectives, policies and mechanisms agreed to by governments with regard to its different programmatic areas. Environmental issues are best handled when they involve the participation of all concerned citizens.

In 1999 the IOC produced the Olympic Movement's Agenda 21 (http://www.olympic.org/uk/organisation/commissions/environment/agenda_uk.asp), which was adopted by the Third IOC World Conference on Sport and the Environment on October 23, 1999, in Rio de Janeiro, Brazil:

"1. The Olympic Movement's Agenda 21 is an instrument setting out the general actions needed in the fields in which the Olympic Movement can bring an effective contribution to sustainable development.

2. All the members of the Olympic Movement, and all participants in sport and enterprises associated with sport, should be invited to comply with the recommendations of the present Agenda 21 to the best of their ability and with due respect for their cultures, traditions and beliefs.

3. All members of the Olympic Movement should be urged to integrate sustainable development into their policies and activities, based on the above Agenda 21; they should also encourage all individuals that are linked to them to behave in such a way as to ensure that their sporting activities and their lifestyles play a part in sustainable development. " ...



The sports community has an important role to play. Several levels of responsibility may be considered.

Individual responsibilities

Inherent responsibility as citizens to live in harmony with their surroundings and ensure that the needs of future generations will be met and responsibility to comply with ecological criteria. In their daily lives, all citizens have the opportunity to change

most of their habits in order to make them more environmentally sound.

Responsibility of athletes

All sportsmen and sportswomen, whether elite or occasional athletes, belong to the planet and as such have a responsibility to reduce their impact on the environment in their daily lives. A degraded environment affects them directly inasmuch as it threatens their performances and, ultimately and more importantly, their health and even their lives.

A genuine concern for environmental issues should therefore be shown, and a leadership role in environmental protection should be adopted through a change of attitude and the promotion of environment-friendly sport. Whether mere village players or full-fledged champion performers, all athletes can have a significant influence on the community. Through their special position and exemplary conduct, they can convince sportsmen and sportswomen and particularly youth, to adopt environmentally sound behavior.

Responsibility of coaches and managers

A major responsibility lies with coaches, who are able to influence the spirit and the manner in which sportsmen and sportswomen behave and perform. Athletes will inevitably respond to the attitudes and values of their coaches. This observation does not apply solely to top-level athletes and teams. All persons assuming a role of leadership in sport have open to them a privileged channel enabling them to communicate basic environmental principles to youth and contribute to their education.

Responsibility of spectators

Sport attracts spectators whose influence on the environment should not be neglected. When they respect the environmental advice given by organizers, such as avoiding waste clumping and using environmentally-sound means of transportation, they demonstrate through their behavior a commitment to preserve the environment.

Collective responsibilities

Organizational responsibilities

Being aware of environmental problems is the first step towards being able to solve them. Although the development of their sport is admittedly the primary objective of all sports organizations belonging to the Olympic Movement, whether complex and structured bodies such as the International Federations, National Olympic Committees, National Federations, or simply local clubs and associations, all such organizations have to seek to encourage environmentally sound and socially responsible attitudes towards sustainable development. When planning a sports event, be it a major championship or simply a local competition, sports organizations can decide to foster new attitudes by integrating them in their educational programmes or office management practices. Such attitudes may also form part of a separate environmental programme of education and awareness-raising, based on a predefined set of actions which are appropriate to the needs of a particular community and which will work in a specific area. In that sense, each sports organization and social group can, in its own way, contribute to generate among all players of society - consumers, industries, local communities, sports organizations, governmental institutions, etc. - a sense of common purpose.

2.3.2 Basic Principles for Environmentally Sound Practices in the Sports Community

Changing our attitudes and adapting our actions to our needs and resources is a necessity. This can be achieved by undertaking, on a daily basis, simple actions which will foster environmentally sound behavior and preserve our ecosystems:

- prevent pollution
- reduce waste
- use water, energy and other resources efficiently
- manage the use of natural resources prudently
- respect the fauna and its habitat
- commemorate, protect and respect the world's natural, cultural, indigenous, and historical heritage
- contribute to environmental education and training through sport
- support local action and community participation
- promote practices, methods and technologies that reduce negative impacts on the environment

(Source: adapted from UNEP environmental principles)

Having convinced its members of the importance of addressing environmental issues, it is essential for the sports organization itself to ensure that it operates in an environmentally sound manner. A major contribution to environmental protection can often be achieved by making relatively small investments throughout the administrative offices of the sports community.

The implementation of environmental principles can be progressive, allowing for a step-by-step advancement towards environmentally sound office management practices. Besides reducing negative impacts, it is a good way for a sports organization to demonstrate its environmental concern in a variety of circumstances.

Green Office

The Green Office concept refers to the minimization of environmental impacts at the office. Green Office management involves caring for the environment in every work situation, from the choice of equipment to waste management. This concept is not only nature-friendly; it also leads to long-term savings. Here are some basic principles and attitudes which should be implemented, whenever possible:

General

- turn on lights, computers and other equipment only when necessary
- encourage the elimination, in all cafeterias, of disposable and excess packaging
- inform all people working in the office about the Green Office programme - make it simple to follow

Paper

Paper is the principal commodity used in offices. It represents more than half the waste created by a typical office. Using environmentally friendly paper and

minimizing use protects the environment and saves money.

- evaluate the real needs before producing a document (avoid useless copies)
- use unbleached and de-inked paper with a high recycled content (if necessary, use chlorine-free bleached paper) avoid useless paper sheets on faxes and printers
- produce double-sided documents
- reuse paper which has been used on one side only (for draft documents, note paper, etc.)
- collect used paper for recycling
- ensure that all publications meet environmental standards

Equipment and facilities

Some photocopiers, printers, fax machines and computers have in-built features which reduce their consumption of energy, alleviate environmental impacts and minimize operating expenses.

- choose photocopiers and printers with double-sided capabilities and standby features, which can use recycled paper and whose cartridges can be refilled
- choose computers with energy-saving features

Purchasing supplies

- give preference to:
 - reusable and durable supplies and materials
 - products that meet or exceed national environmental standards
 - products with minimal packaging

Waste management

- appropriately dispose of any hazardous products whose use cannot be eliminated
- recycle glass, cans, newspapers

2.3.3 Communicate and Educate

The goal of the Olympic Movement is to contribute to educate youth through the practice of sport and to promote ethical values. The importance of sustainable development must form an integral part of this educational project which places sport at the service of humanity.

Therefore, sports organizations should undertake regular actions at the community level to foster communication and to promote environmentally sound behavior, in cooperation with other entities concerned by this issue.

A large number of actions may be undertaken at different levels and adapted to each community's needs. Some of these actions could be to:

Communicate and Educate

- use existing sports events to promote messages in favour of environmental ethics, drawing on the support of well-known athletes and local leaders
- incorporate the theme of sport and environment in seminars, workshops and training sessions

- organize specific activities to raise awareness regarding environmental protection, such as clean-up days
- inform the local population about your environmental activities
- use the media to achieve success in projecting your message

2.4 PARTNERSHIPS AND CONSENSUS BUILDING

When seeking to promote environment-friendly behavior and actions, sports organizations must often rely on external support for the expertise required to identify and solve the ecological problems which they have generated or from which they suffer. This support may be provided by ministries of the environment, national agencies, local authorities and public utilities dealing with water, electricity, public transportation, construction, etc. All these bodies have information regarding national and specific legislation pertaining to the environment, the current status of certain environmental problems, the international and non-governmental organizations working on social and environmental issues able to provide direct expertise, the commercial and industrial companies incorporating environmental considerations into their management and operations, as well as the scientific and technological groups dealing with urban planning and community construction.

Partners with whom sports organizations may cooperate include :

- national, regional and local environmental departments
- international organizations dealing with social and environmental issues
- ecological non-governmental organizations
- environmental consultants
- professional associations
- business and industry
- universities and scientists
- local communities

Form of intervention :

- members of the environmental commission of the organization
- other parties monitoring compliance with the law
- consultants and technical experts
- participants acting as watchdogs
- external examiners

Hereafter are various suggestions which should facilitate the actions of sports organizations willing to address environmental issues.

2.4.1 Establishing Consultation with Environmental Partners

A common approach, particularly among sports organizations and associations, is especially interesting in the following domains:

- influencing individual behavior
- planning land use jointly
- influencing the sports industry

Although this partnership can be implemented in a simple way through informal contacts, it may be further developed and structured for large-size events involving broad participation. Cooperation between all parties, authorities and NGOs is in any case an important factor for successful environmental work. This cooperation will generate new environmental expertise, together with new environmental services and products of local, national and/or international interest.

Environmental problems should thus be resolved through a planning process, in close cooperation with local and regional authorities as well as other interested parties. Environmental objectives should be established as a common platform of action by local organizers, together with NGOs, municipal and regional authorities, and environmental experts.

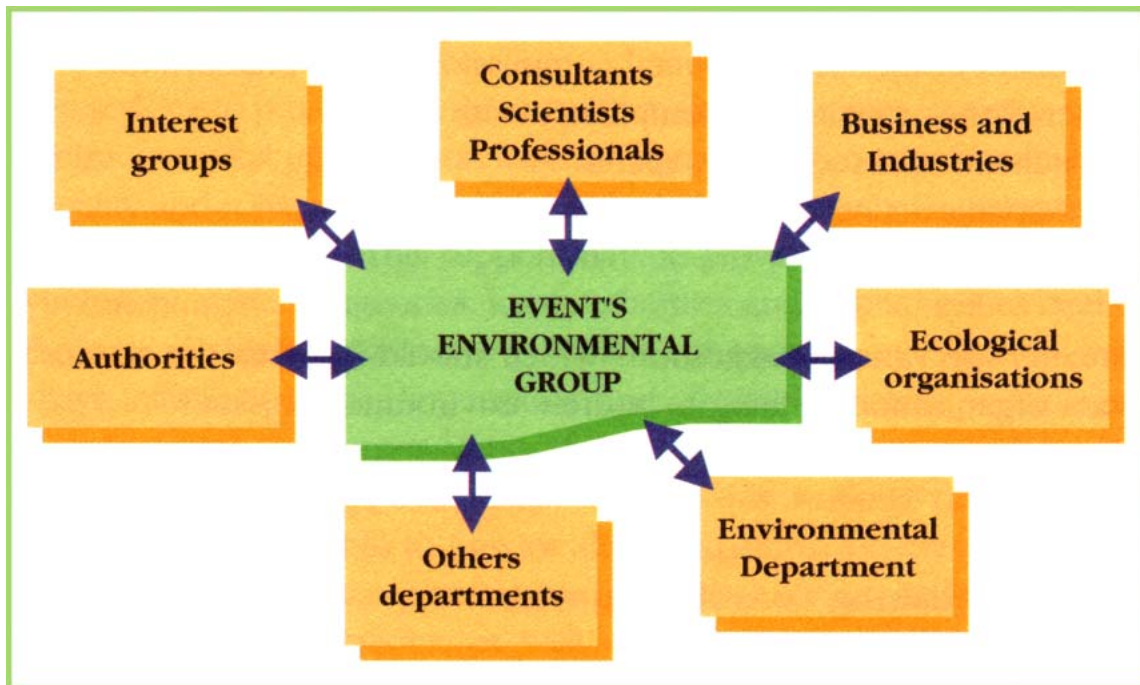


Figure 5: Cooperation is the key to success

Depending on the nature and size of the event, this process can be more or less formal. For large-scale events, the cooperation process can be implemented through an environmental commission comprising representatives of all the interested parties. There is also room for informal cooperation arrangements. The process, roles and duties of each party should be clearly defined. For small events, the cooperation process does not require such organization and can be implemented on the basis of less formal contacts and actions. Whatever the case, though, it is essential to:

- set common and reasonable environmental objectives - build a consensus
- consider, in the initial phase, the direct and indirect effects of each solution
- make consultation and cooperation a part of the process; it is necessary to create a process whereby people's viewpoints, both inside and outside the organization, are fully taken into account and put to good use; formal and informal consultation is necessary

No individual participant is capable single-handedly of dealing with all environmental

issues. Sports events organizers need advice, support and a network of relevant expertise from which to draw. All concerned parties should be present when defining problems and seeking solutions.

2.5 ENVIRONMENTALLY SOUND EVENTS MANAGEMENT

An environmentally sound management of all sports events should be undertaken. Although large-scale sports events usually raise concern about environmental protection, smaller activities must also focus on these issues because of the pollution and degradation which may be caused by those attending.

The objective is to offer recommendations for each kind of event, whether large or small. Some recommendations are more specifically designed for large-scale events; yet they may be applied, at least partially, to community events with minimal facilities. The aim should be for every person, club or organization to reduce their environmental impact, even by a small measure.

2.5.1 Environmental Protection Concepts

The need to safeguard the environment underscores other needs such as identifying the problems at hand and developing strategies and actions to solve them. In order to integrate environmental concerns at each level of a sports activity, it is necessary to keep in mind the concepts shown in Figure 6.

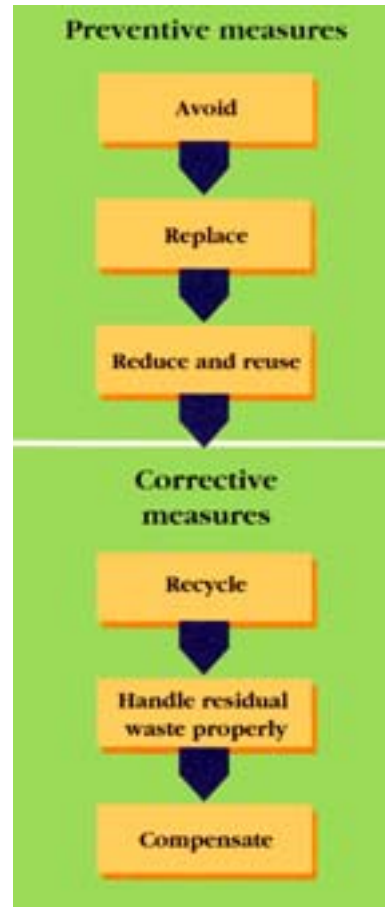


Figure 6: Environmental protection concepts

These principles can be applied to every aspect of a sports event or sports organization, particularly in the early stages of planning. In this regard, it is worth noting that prevention measures are usually cheaper than remedial measures, as the latter may include restoration, reforestation and waste treatment taxes.

• Preventive measures

When planning an event, environmental prevention measures should be included. Although some emphasis must be laid on modifying processes and behaviors, the reduction of environmental impacts must remain the primary objective. This principle

requires that environmental impacts be avoided from the very outset. If this is not possible, such impacts should be reduced or replaced by other products, management systems or technologies.

The "cradle to grave", or "life cycle assessment" (LCA) principle should also be adopted, together with the concept of "product stewardship" which stipulates that all the necessary steps to minimize environmental impacts be integrated into a product, from the extraction of raw material, through the manufacturing process, use of product, recovery and reuse of wastes, to their ultimate disposal.

• **Corrective measures**

Environmental measures must also be applied to reduce effects both during and after a sports event. This means recycling, eliminating and compensating.

The application of the "polluter pays" principle, although obvious in its implications, also provides an incentive to develop environmentally friendly products, uses and approaches. Such a principle must therefore be extended to all sports events, with compensation projects paying for environmental deterioration, preferably in the form of restoration.

All the above principles may, by extension, be applied to organizational and operational functions.

2.5.2 Methodology

Events management refers to all actions necessary to plan, organize and stage a sports event, whatever its size. All types of events may be considered:

- large-scale events (Olympic Games, University Games, regional games, World Cups and championships)
- national and local competitions
- university and school events
- professional sport
- recreational and training programmes
- outdoor education

Once the interested parties have been brought together, a cooperation process should ensue. Depending on the size of the event, the organizers will develop a work methodology, adding some items for a major event and withdrawing others in the event of smaller activities. A work methodology is proposed below .

Whatever the case, the following steps should be taken:

- define the environmental state and the effects generated by the event
- select objectives
- choose ways to achieve those objectives

Environmental Impact Assessments (EIA) are processes which assist organizers in planning and managing events in an environmentally sound manner. An EIA examines the potential impacts of a project on different components of the

environment such as water, soil, air, fauna, flora, and examines the issue of resource management. Undertaking an EIA ensures that the effects of a given project are duly foreseen. As a result, negative impacts may be avoided, solutions to environmental problems found and actions with positive effects proposed.

EIAs are generally carried out by a team of environmental specialists with the agreement of the competent authorities. The need for a project to be submitted to an EIA depends on the local environmental legislation, which defines the projects that have to be studied in function of their characteristics, such as their size or environmental risk (e.g. stocking and transforming fuel). The legislation also defines the way in which an EIA has to be conducted. EIAs can be done at two levels: a global strategic level and a more detailed level. Both levels are important.

- **The strategical EIA** studies various alternative locations. It develops a process to assess the global impact of an event and helps choose a sound place where it could take place without causing irreversible damage to nature. It assists in identifying areas where an environmentally sound events management is possible.



- **The detailed EIA** takes place after the location has been chosen. It studies the details of construction and proposes actions to avoid or reduce the impact of infrastructure.

Methodology

- Collect environmental data. Establish the initial state of the regional environment. Draw up a list of environmental losses and benefits for the region generated by the event.
- Evaluate the environmental problems. Foresee the future needs of the city and the region. Identify the environmental and social impacts.
- Define a global environmental policy that takes into consideration the respect for the environment according to the principle of sustainable development. The event should be planned with a view to integrating, under the framework of the environmental policy of each country, the local, national, and regional situations at different levels:
 - land use plans
 - environmental policy
 - sports policy and after-use of the installations

- Outline the environmental objectives for the event and indicate the main concepts. Below are a series of potential concepts:
 - strengthen the development of the region
 - protect the character of the region and the regional interests
 - minimize the environmental impacts
 - ensure environmental friendliness of related buildings and development work
 - adapt designs to existing landscape
 - use temporary structures for the equipment not needed in the future
 - encourage technical and organizational environmental solutions
 - ensure environmental quality for all features of the event
 - promote a new economic approach in the long term
 - improve the quality of life
 - promote and introduce environmentally sound technologies in the region
- Seek variants and alternatives. Propose various solutions for the location. Carry out social and environmental analyses, and strategic EIAs for all the alternatives in order to optimize the choice of location.
- Draw up environmental standards (guidelines) for the event. Establish policy documents for the following areas of action (see also sub-section 2.5.3). Carry out a detailed EIA for:
 - location and landscaping
 - sports facilities
 - sports equipment
 - transportation
 - accommodation and catering
 - water management and sanitation
 - energy
 - waste management
 - administration
 - monitoring and awareness programmes
- Ensure coordination, collaboration and technical support.
- Plan an environmental budget covering environmental studies, protection and restoration measures, and environmental education and public awareness-raising programmes before, during and after the event.
- Guarantee the restoration of temporary sites and installations.
- Ensure the commitment to environmental protection by all the participants in the event.
- Foresee environmental compensation measures according to residual impacts (i.e. compensate the destruction of natural areas by recreating natural areas elsewhere).
- Inform, motivate, communicate and educate. People must understand the policies and objectives.

- Collect environmental data to set up a global environmental balance after the event for the benefit of future organizers.

2.5.3 Areas of action

Managing a sports event involves a wide range of actions pertaining to the concentration of infrastructures and people. Environmental measures can be included in several areas of action. Having presented a general work methodology, this section provides practical recommendations to help solve environmental problems in each different area.

Location and landscaping

Location is the critical point of a facility or event. It determines not only its environmental impact but also its accessibility, proximity to users and visual impact. The choice of location can either reduce or intensify the negative influence of the facility or event. An environmentally sound site is usually financially sound as well.

The site selection occurs during the planning of new facilities or of national/international championships. Selection criteria have to be applied during the decision process.

The objectives are to:

- Minimize environmental impacts by choosing the most convenient site
- Conserve and protect special landscapes

Cities and regions bidding to host a sports event should prove that they comply with the environmental recommendations of the relevant sports federation. When building new facilities, the same criteria have to be taken into account. An environmental report, such as an EIA, is often requested by authorities before they issue a building permit.

Environmental elements to consider when choosing a location for sports venues are (Strategic EIA):

a) Elements of the man-made environment:

- legal and physical boundaries, private holdings and public easements
- buildings, bridges and other structures, including those of historical and archaeological significance
- roads, paths and sidewalks
- availability of public transport
- electric lines, water, sewer and gas mains
- solid waste: disposal sites, treatment plants, management and transportation
- wastewater: sewers, treatment plants
- land use: residential, commercial, industrial and other
- applicable ordinances
- existing sports facilities that can be adapted

b) Natural resources :

- protected sites
- forests
- water resources
- air quality

c) Natural elements:

- climate conditions
- local morphology

d) Perceptual elements:

- landscapes
- special elements
- aesthetic values
- cultural values

Detailed planning - Detailed EIA (once the choice has been made)

- plan the integration of the event or facility into the landscape
- foresee protection measures
- foresee restoration measures
- foresee compensation measures

Sport facilities

Sports facilities constitute the most visible part of any sports event or organization. Their location, construction, materials and operation processes constitute potentially high nuisance and damage sources. These include land waste, landscape harm, high energy consumption, pollution and waste of financial resources when such sports events or organizations are not adequately planned or seriously managed.

The objectives are to:

- avoid venues with little or no post event usage
- reduce location-related impacts (landscape, land use)
- minimize energy consumption
- reduce pollution

Sound planning also allows organizers to reduce costs by avoiding oversized facilities, and to minimize operation and overhead costs.

a) Planning phase

First of all, the advisability of the project has to be justified in order to avoid unnecessary and over-sized facilities.

When carrying out detailed planning, environmental criteria should be part of the decision-making process. During this phase, the project management team is responsible for establishing a detailed project aiming at detecting and minimizing all foreseeable impacts. Architectural studies are realized, building materials selected and maintenance processes determined. Thinking of the environment at this stage can help organizers and planners avoid subsequent problems.

Planning phase

Advisability of the project (Strategical EIA)

- real need for a new facility
- opportunity to use or restore existing facilities
- sizing of the facility
- future use and needs after the event (in the case of a major sports competition)
- use of temporary installations when there is no future need (in the case of a major sports competition)
- multiple- or single-use facility
- financing plan including construction, maintenance and operation costs

Detailed planning (Detailed EIA)

- avoid illegal building
- include energy concerns in architectural plans, and especially thermal considerations, in order to minimize the energy required to cool or/and heat the building
- promote environmentally sound technologies like solar energy, heat pumps
- foresee an environmentally sound operation phase
- foresee compensation and restoration measures if necessary
- select building material as follows:
 - select materials for thermal performance
 - seek maximum recycled content and recyclable materials
 - choose durable, easily repairable or interchangeable items
 - select materials free of hazardous or toxic products
 - choose products which will not need to be disposed of as hazardous waste
 - use materials that are available in the region
- plan an architectural integration into the landscape

b) Construction phase

During this phase, accidents and disturbances can occur, like the accidental release of toxic substances, increased traffic, soil packing or noise. A sound and rigorous planning of construction can protect not only the environment, but also the workers and the people living nearby.

Construction phase

- build at a time of the year when animal life and humans will be least disturbed
- install acoustic isolation if necessary
- plan soil management
- use appropriate engines
- avoid where possible the use of toxic substances
- plan the management of all substances being used in the work place (storing, use, evacuation and treatment)
- ensure that the project is in conformity with building plans
- use environmentally sound construction techniques and materials

c) Operational phase

The operational phase is almost always the longest in a facility's life. The facility is

supplied with water, energy and other goods, the equipment is maintained and the waste removed. The facility hosts training and competition activities. It is possible to adopt a "green step" approach for all these activities.

Operational phase

- Saving energy with:
 - heating, cooling and ventilating systems
 - lighting systems
 - hot water systems
 - equipment
- Reducing risks caused by chemicals:
 - avoid or replace dangerous chemicals
 - store them carefully
 - follow instructions for use and local health and safety regulations
 - ensure that they are disposed of and treated in an environmentally sound manner
- Reduce noise and disturbance

d) Special facilities

Facilities are different and so are the impacts they produce on the environment. This section offers some suggestions for specific sports facilities.

Outside playing fields (grass, artificial cover, tennis fields, etc.)

- select local species of grass requiring less water
- reduce watering during the dry season, use watering systems which limit evaporation (spray) and water during the coldest part of the day
- suppress or at least limit the use of pesticides and chemical fertilizers
- tolerate a greater amount of weeds
- ensure ecological planning and management of adjacent surfaces (avoid pesticides and chemical fertilizers, introduce several plant species, etc.)

Indoor sports halls (gymnasias, swimming pools, ice arenas, etc.)

- passive use of solar energy in the architecture
- check the energy balance of the building
- introduce energy-saving equipment and appliances
- use alternative treatment to keep the water clean (without chlorine gas)
- choose cooling chemicals without chloro-fluorocarbons (for ice arenas)

Outside trails (for jogging, equestrian, mountain bike, etc.)

- prevent erosion by avoiding fragile areas and reinforcing critical passages
- avoid wildlife habitat
- build trails without asphalt
- promote ecological behavior among athletes by informing them on issues such as waste collection and protection of fauna and flora

Ski trails (alpine skiing, ski jumping, biathlon, etc.)

- limit the construction of new trails
- choose with care sites for new trails
- choose snow-making machines using low amounts of water
- eliminate the use of snow-hardening chemicals

Water sports (sailing, windsurfing, rowing, etc.)

- avoid docking location in sensitive areas (especially wetland areas, natural banks and shores, etc.)
- build docking with as little hard materials as possible
- avoid anti-fouling products (especially those containing arsenic, mercury or organotins)
- forbid access to water courses, lakes or water areas during periods which are critical for the fauna (e.g. reproduction time)

Sports equipment

Due to the great variety of sports and to the development of new technologies in sports equipment, the market of sports articles is incredibly varied while at the same time highly specialized. This evolution has led to the use of new substances in the manufacturing processes.

Some of those substances are potentially toxic and can be damaging during the manufacturing, use or disposal of the equipment. Another point to keep in mind is the shorter life span of some equipment, which becomes obsolete before being out of order, and generates waste as a result.

The objectives are to:

- reduce pollution due to sports equipment
- reuse and recycle articles where possible
- promote environmentally sound equipment and local manufacturing knowledge

It is important to work closely with sponsors and suppliers to ensure that their products and services are environmentally friendly. This is achieved by establishing a standard contracting process. Sponsors and suppliers should be encouraged to follow some environmental requirements and comply with them. They have to assume their own role in the quest for environment-friendly sport. Some environmental requirements for the sports industry could be to provide information on their production processes, their waste management systems, the use of reduced packaging, the reusability and non-toxicity of their products, etc.

It is also important to encourage companies manufacturing sports equipment to obtain ISO 9,000 and 14,000 certificates for Quality Assurance and Environmental Management.

ISO, the International Organization for Standardization, is a nongovernmental organization setting international standards for a wide range of products and processes. The recent publication of the first two International Standards in the ISO 14,000 series of environmental management standards will assist business and

industry to meet environmental challenges.

The ISO 14,000 series of standards are developed by ISO, which represents the standards institutes of some 120 countries. This series of standards aims to introduce a comprehensive systems-based approach which can be used by businesses and other organizations to manage the impact of their activities on the environment.

With respect to sports equipment, several of society's players have an opportunity to act at their own level:

- individual responsibility of the athlete/sports club in the choice of equipment
- responsibility of International and National Federations and other sports organizations in defining environmental standards for their equipment
- responsibility of suppliers in the manufacturing processes

Athletes and clubs

- Choose environmentally sound articles (cotton, natural fibres, etc.)
- Promote the use of locally- and ecologically-made products instead of imported ones (e.g. for nets, clothes, halls, etc.) which saves energy, transportation, money and contributes to promoting local knowledge and employment
- Arrange a trading market/day for equipment which is no longer suitable/no longer in use

Sports federations and organizations

- Define environmental standards for their equipment

Sports industry

- Certify your industry in accordance with ISO standards for Quality Assurance / Environmental Management/ (ISO 9,000 and 14,000)

Transportation

Transportation is required to get to the sports facility and much of it usually takes place in private cars. Transportation contributes to many environmental hazards, particularly air pollution (greenhouse effect, ozone formation at ground level, PAHs) and related health problems. A reduction in the distances traveled with private cars, incentives to promote public transportation and non-pollutive transport (e.g. bicycles) together with sound transportation planning could greatly minimize air pollution, noise and disturbance, as well as the extent of land use.

The objectives are to

- minimize transportation
- promote collective and or public transportation
- encourage environmentally friendly transportation

Recommendations for ecological transportation :

- select specific transportation systems which minimize energy use and reduce pollution
- encourage public transportation systems over private transportation
- issue tickets for the event that entitle their holders to free public transit rides
- encourage access to facilities on foot
- encourage the construction of bicycle routes and parking for bicycles near the sports facilities
- encourage the use of collective transportation for trips to meetings, tournaments and matches
- organize training and competitions in such way that as many participants as possible are able to take part without travelling by car
- organize collective transportation where motor transport is necessary

Energy

Most of the energy used around the world is currently unsustainable. It is largely produced by non-renewable sources such as fossil fuels, which cause a great deal of pollution and are the biggest contributor to global warming and localized air pollution. Many forms of energy production, like nuclear plants or fossil-fuel burning, involve some degree of risk to human health or to the environment.

In sports events, energy is required to produce goods that are consumed, to run the event and related facilities, and to transport people and products to the event. As in other human activities, the energy used is mainly produced with non-renewable resources. Even if sports organizations can generally not exert an influence on the global energy policy of a region, they are able to act at their own level.

The objectives are to:

- reduce energy consumption
- promote renewable energy and new technologies
- promote equipment and facilities with smaller energy demands

Community-based organizations can make a major difference when it comes to reducing energy consumption. A number of suggestions have been listed hereafter to encourage each organization to find solutions that are appropriate:

Recommendations for energy saving

- promote awareness through education in the club
- be energy-wise; switch off electrical appliances when they are not in use
- check the lights; remember to switch off lights when leaving a room
- insulate sports facilities in order to keep them cool or warm, as the case may be
- explore alternatives; if available in your community, try to use solar energy to heat water, provide electricity, or both; if available, use small hydraulic plants
- promote energy conservation measures, select equipment and materials accordingly
- hold meetings with local energy supply companies to get tips on further energy

saving measures

- reduce (heating systems) or increase (cooling systems) the indoor temperature in your premises by at least one degree and lower the temperature outside periods of use

Accommodation and catering

Whether championships or local competitions, sports events attract a large number of persons, i.e. athletes, coaches, organizers, journalists, staff members, sponsors, spectators, who require catering and accommodation for several days.

The objectives are to:

- minimize waste
- avoid useless construction

It is the responsibility of the events organizer to define the requirements for catering and accommodation suppliers, which should include:

Accommodation and catering

- respect sanitary conditions
- reduce packaging
- recycle goods used
- use existing facilities (to cook and wash)
- replace disposable dishes with reusable ones where possible
- build temporary facilities and hotels if there is no guaranteed need for them after the event

Water management and sanitation

Freshwater resources are finite and exist in a closed system. Water supply depends on rivers, lakes, and accessible aquifers and the need for drinking water and irrigation and, increasingly, the need of power for our industries. In most parts of the world, freshwater resources are being subjected to intense pressure. Industrial wastes, sewage and agricultural runoff overload rivers and lakes with chemicals, wastes and nutrients, poisoning water supplies as a result.

When practising sport, water is needed to satisfy drinking, washing and maintenance needs. Sometimes, water is part of the sports facility itself.

The objectives are to:

- satisfy the needs generated by the sports event without endangering the water supply of the region
- protect water resources
- treat wastewater

Recommendations for efficient water management

a) Ensure that the water provided in your facility is of good quality; if not, take

measures to purify it:

- filter your water
 - boil the water for at least five minutes
 - use iodine (two drops per litre) or tablets; only use chlorine if absolutely necessary
- b) Use water efficiently; turning off the tap when you are not using water is the simplest and most effective way to save water, whether washing your hands, brushing your teeth or shaving; turn on the water only when needed.
- c) Reduce the use of water required to maintain your facility, e.g. the watering water
- d) Encourage sound sustainable water resource management programmes including:
- water conservation and recycling practices
 - recycling of treated storm water and sewage effluents
 - landscape design that decreases water requirements
 - building and infrastructure design to collect wastewater for recycling
- e) Wastewater management:
- ensure the treatment of all wastewater
 - verify the quality of treated wastewater
 - if no wastewater treatment plant is available in your region, build your own sanitary system (possible at limited costs)
 - reuse treated water for field irrigation, bathrooms services, etc.
- f) Watch out for toxins that may remain in your facility

Waste management

Sports activities, especially large-scale ones, can generate considerable waste, some of which cause little more than dirt or minor disturbances, while others have a harmful and lasting effect on the environment and human health. Waste is unavoidable, but sound management ensures that waste quantities are kept to a strict minimum.

The objectives are to:

- minimize waste to be disposed of and treated
- minimize pollution due to waste

Recommendations for efficient waste management

- reduce the amount of materials handled
- avoid useless packaging through discussions with your suppliers
- use as few disposable products as possible at your events
- choose carefully the goods and materials handled, in particular:
 - avoid goods containing toxic substances
 - choose reusable or recyclable goods
 - choose goods whose waste can be appropriately treated in the treatment

- plants located in your region
- implement sorting at source (sufficient and separate rubbish bins)
 - dispatch the materials to recycling markets
 - separate hazardous waste from domestic waste
 - treat all waste properly
 - implement a waste management programme if necessary

2.5.4 Large-scale Sports Events: Specific Recommendations

Large-scale sports events attract high numbers of people and necessitate the handling of large quantities of goods. This concentration of people in time and place represents a potential danger for the environment. Some measures have to be taken in order to limit the impact.

A) Sports facilities

- use provisional installations for the facilities not needed in the long term; encourage improvement of existing facilities
- use provisional and module equipment which is easy to transform and reuse
- implement multiple-use facilities
- guarantee to restore provisional facilities and encourage the restoration of damaged sites

B) Sports equipment

- the organizing committee must define environmental requirements for sponsors and suppliers, such as environmentally friendly processes and products, collaboration on waste management systems, etc.
- ensure that the organizations participating in the event are certified in accordance with ISO standards

C) Transportation and air quality

- implement transport strategies to ensure the efficient movement of people (athletes, coaches, journalists, officials and spectators)
- establish a transportation concept promoting transport on foot, by bicycle and public transportation
- establish a global air quality plan for the region
 - monitor emissions
 - encourage major air polluters, including public utilities to take permanent steps to reduce their emissions prior to the event
 - establish energy management strategies
 - encourage transportation fleet operators to take steps to reduce emissions
 - work with municipal officials to reduce traffic

D) Energy

- establish an energy management programme for the region taking into account the transportation system and sports facilities

E) Waste management

- host cities and regions have the capacity to adopt waste disposal procedures throughout the area in accordance with the event, using techniques that may in turn be applicable to future arrangements; it is advisable to:
 - reduce the amount of materials handled
 - establish environmental requirements for the event's suppliers and donors
 - separate recyclable materials at the source in the arenas by the waste generator, and separate collection
 - separate household and manufacturing waste at the source
 - dispatch materials to recycling markets
 - deal with all waste in a safe and cost-effective manner
 - implement a comprehensive strategy for materials and waste management
 - emphasize communication with education
 - choose products according to cost/performance over their entire life-span

F) Environmental message to the public

- Internal environmental awareness: all the members of the organization, senior managers and volunteers alike, should be informed of the broader rationale for their duties.
- External environmental awareness: people of the region must understand the environmental policies and objectives that are being established. Education and communication are essential to the success of sustainable development.
- World-wide awareness: large-scale events are broadcast around the world. Environmental education explaining the environmental programmes and efforts can therefore reach millions of individuals and have great influence.

G) Finances

- include environmental costs in the budget from the outset



CHAPTER III: ENVIRONMENTAL POLICY AND ACTIONS

3.1 EDUCATION AND AWARENESS-RAISING

The International Olympic Committee, in its capacity as leader of the Olympic Movement, has resolved to fully integrate the protection of the environment in its philosophy and programmes. Considering its importance for the development and survival of our society, the environment was introduced into the Olympic Charter in 1994 and is today recognized as the third pillar of Olympism, after sport and culture. The objective is to extend the IOC environmental policy not only to the organization of the Olympic Games - its first duty - but also to ensure that the protection of the environment forms an integral part of the educational values which are taught to the youth of the world through sport.

The IOC has undertaken a series of actions to raise awareness among the sports community in general about the necessity to include ecological principles in their daily activities.

- In 1972, the Olympic Movement took a symbolic initiative on the occasion of the Games of the XX Olympiad in Munich. National Olympic Committees from all over the world came with a shrub from their respective countries and planted them in the Olympic park adjacent to the sports facilities. By analogy with the expression "mens sana in corpore sano", the formula "certatio sana in natura sana" - in other words, a healthy competition in an intact environment – was coined by a German couple, Luzian and Sigrun Verbogen.
- During the celebration of the Games of the XXV Olympiad in Barcelona in 1992, the IOC, following the appeal launched at the "Planet Earth" summit in Rio de Janeiro, called on all International Federations and National Olympic Committees to sign the Earth Pledge whereby the components of the Olympic Movement undertook to contribute, to the best of their ability, to making the Earth a safe and hospitable home for present and future generations.
- In 1994, after the closing of the XVII Olympic Winter Games in Lillehammer during which special emphasis had been laid on environmental protection, the IOC President signed a cooperation agreement with the United Nations Environment Programme to develop joint initiatives in this field.
- The Centennial Olympic Congress, Congress of Unity, held in Paris in 1994 also highlighted the importance of this topic by devoting an entire session to the relationship existing between sport and the environment. This interest was taken a step further with the setting up of the Study Commission of the Centennial Congress, whose recommendations were approved by the 105th IOC Session in Atlanta, United States, in July 1996:

"The IOC Session,

Recalling on the one hand the concerns expressed by the participants at the Centennial Olympic Congress, Congress of Unity, that the Olympic Movement take a leading role with respect to the environment, and noting, on the other hand, that, even prior to the Centennial Olympic Congress, Congress of Unity, the IOC adopted and published its policy on the environment,

Recognizing the unique opportunity provided by the regular celebration of the Olympic Games to emphasize the importance of the environment,

Keeping in mind the action of the IOC in convening the World Conference on Sport and the Environment in Lausanne in July 1995 and the many positive suggestions for action as well as recognition by the world community of the actions and efforts by the IOC in support of protection of the environment,

Observing that many opportunities may present themselves for cooperation with other international and national governmental and non-governmental organizations in activities directed toward protection of the environment,

Firmly believing that IOC policy on environment should be specific to the IOC; that efforts by other groups having goals in the field of the promotion of the environment should be taken into account by the IOC when establishing its policy; that the IOC should not let other objectives supplant its own.

Noting that it is important to bear in mind the specific character of the IOC as an international organization dealing with developed and developing countries; that the evaluation of the environment protection policy as well as of the means of implementing and propagating it in the most efficient way possible must be adapted to the country concerned,

Recalling that there may exist, with regard to specific measures or behavior, cultural and perceptual differences that should be taken into consideration before any definite position is adopted; that it is important to adopt a foresightful approach to the environment; that, in this respect, education is an extraordinary tool for awakening in individuals an awareness of the necessity of encouraging sustainable development; that some countries may have differing priorities in the field of environment, and that these concerns should be taken into consideration when evaluating behavior in the field of the protection of the environment,

Desires that further efforts be carried out to protect the environment and to educate the youth of the world concerning its responsibility in this regard;

Notes that notwithstanding the establishment of the IOC Commission on Sport and the Environment, it must be remembered that the ultimate responsibility for matters relating to the environment rests with the competent authorities and that the proper role of the IOC is to encourage environmentally responsible conduct".

Furthermore, following the recommendations made by the Centennial Congress Study Commission, the Olympic Charter was modified to include an extensive reference to the environment. The current reference is:

Rule 2, paragraph 13

(...) 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;

- It is within this framework that the IOC decided to create a special Sport and Environment Commission, composed of representatives of the Olympic Movement and experts on environmental issues, responsible for formulating recommendations to the IOC President and the Executive Board on the development of its environmental policy.
- Moreover, a special section of environmental affairs was established in the IOC administration and is in charge of the implementation and follow-up of all IOC educational programmes in this field. A budget has also been allocated by Olympic Solidarity to finance these projects.

The educational actions of the IOC are performed at three main levels:

1) Information

Provide general information on issues related to sport and the environment for the members of the Olympic family. Ensure that this theme is regularly covered in all IOC statements, publications and major activities.

2) Conferences

Organize a biennial World conference on Sport and the Environment, which brings together representatives and partners of the Olympic Movement, as well as representatives of other entities with which we need to cooperate in this field, i.e. governments, international and non-governmental organizations concerned with environmental matters, industry and business sectors, research institutes, media, etc. The aim of these conferences is to regularly assess the progress made in the field of environmental protection by the Olympic Movement, give an opportunity to provide new knowledge on these issues by sharing experiences and expertise from different sectors of society, and encourage cooperation in, and further development of, environmental policies in relation to sport. The first World Conference was organized in Lausanne, Switzerland, in July 1995.

3) Regional Seminars

Organize regional seminars on sport and the environment for the National Olympic Committees. The aim of these seminars is to awaken the sports community to the need to protect our environment, provide basic guidelines as to how to address environmental issues, find appropriate solutions based on the local reality, encourage cooperation which may offer the necessary expertise, and foster, in the medium and long term, the development of a self-sustained environmental programme in each NOC.



These seminars are building on the cooperation of IOC representatives with several experts coming from UNEP regional, national environmental agencies, local authorities and public utilities representatives, non-governmental organizations and other sectors concerned by this issue.

Environmental Requirements in Administration

The International Olympic Committee implements a series of environmental requirements in the daily activities of its headquarters to reduce the use of resources, and reuse and recycle most of the waste produced by the administration. These requirements will be further developed.

- Energy-saving features in the light systems, computer network and photocopying machines
- Water-saving features
- Waste management with disposal of hazardous products and recycling of paper, glass, PET bottles, batteries, aluminium, iron, electric cables and copper wires, electronic devices, wood, other conditioning material, ink, oils, household rubbish
- Paper use: encourage use of ecological paper, double-sided documents, reuse of paper for drafts.
- Supplies: encourage the use of reusable supplies and material, with minimal packaging.

3.2 ENVIRONMENTAL REQUIREMENTS FOR THE OLYMPIC GAMES

The Olympic Games are a veritable microcosm, a scaled-down model of our society and the problems that trouble it: heavy and light constructions, permanent or temporary; the purchase, distribution and elimination of products; the movement of goods and persons; administration and human resources management. The IOC sees that the Olympic Games are held in conditions which demonstrate a responsible concern for environmental issues, and collaborates with Organizing Committees (OCOGs), competent public or private organizations and authorities in the endeavor to achieve this goal and place sport at the service of humanity.

Therefore, environmental considerations and compulsory ecological studies have been included in the process of evaluating cities applying to host the Olympic Games. This includes the official documents relating to the award of the Olympic Games to the host city, which have to be updated regularly.

- It is fundamental for a successful end result that all studies and planning relating to facilities and infrastructure include environmental principles and parameters from the outset, and that they be directed in such a way as to minimize and where possible eliminate harm to the environment. Environmental principles on architecture, design, landscaping and restoration contribute to a harmonious and natural integration of the Olympic Games into the natural and cultural surroundings. Environmental impact assessments of sites and facilities must be carried out by the applicant cities according to accepted scientific and legal standards, and a summary presented to the IOC. The IOC shows special concern for the surrounding community, cultural monuments, protected areas and species, wetlands, fragile mountain areas and other vulnerable habitats.
- The bid must satisfy legal the norms, rules and requirements established with regard to the environment within the areas of the IOC's competence, and excel in these areas whenever possible. Such excellence can be achieved by the introduction of economic, scientific and technical innovations and by the establishment of appropriate relations with other organizations, the private sector and public authorities.
- Good environmental practice involves the reuse of facilities wherever applicable, the restoration of derelict areas, minimizing transport needs and avoiding destructive land use. It is necessary to encourage efforts aimed at protecting habitats and biodiversity, minimize consumption of non-renewable resources, minimize emissions and pollutants and contribute to increase environmental awareness and concerns. The IOC recommends that special attention be paid to sewage treatment and solid waste handling, energy consumption and water and air quality, in order to enhance environmental health standards and safeguard the health and well-being of the athletes and general public alike.
- Environmental quality standards and knowledge soon become obsolete, and a proactive attitude is necessary in order to meet oncoming environmental challenges. An environmental action plan, complete with local priorities, objectives, goals and projects, is a dynamic way to create a substantial strategy which potentially brings positive development returns, goodwill and tools for continuous improvement. Maintaining a social profile involving community participation with

environmental organizations, local residents and underprivileged groups is necessary to attain appropriate goals and secure the successful implementation of efforts.

The specific requirements to which Applicant and Candidate Cities have to respond can be consulted on the IOC website or obtained directly from the relevant National Olympic Committees.

From these requirements the IOC seeks to understand the Applicant, and subsequently, Candidate City's environmental approach as it relates to the following elements:

- Geographical features
 - Meteorology conditions
 - Public authorities
 - Environmental management systems
 - Venue construction
 - Development projects
-
- Once a city has been elected to host the Olympic Games, a follow-up procedure is carried out by the IOC Coordination Commission, which includes an expert on environmental affairs. The Commission holds regular meetings with the Organizing Committees and ensures that the ecological requirements are respected at all levels.

GLOSSARY

(adapted from UN, WHO and UNEP glossaries)

Agenda 21: the plan of action to achieve sustainable development that was adopted by world leaders at the United Nations Conference on Environment and Development held in Rio de Janeiro, Brazil, in June 1992.

Air deposition: fall out of contaminant of the air over water (rivers, lakes, oceans) and soil, through processes such as rain, snow or simply fall.

Biodiversity (biological diversity): the variety of different living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the variety of different ecosystems that they form. This includes diversity within species, between species and ecosystems, and the genetic variability of each species.

Biological resources: includes genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity.

Biomass: the total amount of living organisms in a given area.

Biosphere: the global ecosystem; that part of the Earth and atmosphere capable of supporting living organisms.

Climate change: the slow variations of climatic characteristics over time at a given place. Usually refers to the change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which, in addition to natural climate variability, is observed over comparable periods.

Conservation: the long-term protection and sustainable management of natural resources in accordance with principles that ensure long-term economic and social benefits.

Ecosystem: a dynamic and complex system of plant, animal and microorganism communities and their non-living environment, all interacting as a functional unit within a defined physical location. The term may be applied to a unit as large as the entire ecosphere, but usually refers to a division thereof.

Environment: all of the external factors, conditions and influences which affect an organism or a community. Also, everything that surrounds an organism or organisms, including both natural and human-built elements.

Environmental Impact Assessment (EIA): critical appraisal of the likely effects of a proposed project, development, activity or policy on the environment. Analytical process that systematically examines the possible environmental consequences of the implementation of projects, programmes and policies.

Environmentally sound: that which does not harm the environment in any way.

Erosion: wearing away and transport of the soil by wind or running water, glaciers or waves. Erosion occurs naturally but is intensified by human landclearing activities.

Fossil fuels: coal, oil, petroleum, and natural gas and other hydrocarbons are called fossil fuels because they are made of fossilized, carbon-rich plant and animal remains. These remains were buried in sediments and compressed over geologic time, slowly being converted to fuel.

Global warming: strictly speaking, global warming and global cooling refer to the natural warming and cooling trends that the Earth has experienced.

Groundwater: fresh water beneath the Earth's surface supplying wells and springs. Groundwater is a major source of drinking water.

Heavy metals: potentially toxic metals such as arsenic, cadmium, lead, mercury and others.

Land degradation: the reduction or loss of the biological or economic productivity from rain-fed cropland, irrigated cropland, or range, pasture, forest and woodlands. Land degradation usually results from unsustainable land use.

Life Cycle Assessment (LCA): assessment of the environmental impact of products and services over their whole life cycle, including raw material extraction, manufacturing, use and waste disposal.

Natural resource: (e.g. tree biomass, fresh water, fish) whose supply can essentially never be exhausted, usually because it is continuously produced.

Non-Governmental Organization (NGO): an organization centered around a cause or causes that works outside the sphere of governments. NGOs often lobby governments in an attempt to influence policy.

Non-renewable resources: natural resources that are not naturally replenished once they have been harvested. Non-renewable resources can be used up completely or else used up to such a degree that it is economically impractical to obtain any more of them. Fossil fuels and metal ores are examples of non-renewable resources.

Pesticide: a substance or mixture of substances that is used to prevent, destroy, repel, or control pests. Pesticides can accumulate in the food chain and/or contaminate the environment if they are misused.

Persistent organic pollutants (POPs): organic pollutants such as organochlorine pesticides, dioxins and PCBs which are poorly degradable in the environment.

Pollution: the contamination of a natural ecosystem, especially with reference to the activity of humans.

Recyclable: refers to such products as paper, glass, plastic, oil and metals that can be reprocessed into products instead of being disposed of as waste.

Recycling: processing and use of wastes in production and consumption processes, for example the melting of scrap iron so that it can be converted into new iron products.

Reforestation: the process of re-establishing a forest on previously cleared land.

Renewable resources: natural resources that have the capacity to be naturally replenished despite being harvested (e.g. forests, fish). The supply of natural resources can, in theory, never be exhausted, usually because it is continuously produced.

Reuse: use of material or products more than once, for example, refilling of bottles.

Sanitation: actions aiming at improving all the conditions which, in the physical environment of the human life, have or may have a negative influence over the physical, mental or social well-being, by means of drainage and disposal of sewage and refuse.

Smog (photochemical smog): literally a contraction of "smoke" and "fog"; the colloquial term used for photochemical fog, which includes ozone and numerous other contaminants. Smog usually adds a brownish haze to the atmosphere.

Sustainable development: development that meets the needs of the present generations without compromising the ability of future generations to meet theirs.

Toxic: harmful to living organisms.

Waste management: characteristic activities include: collection, transport, treatment and disposal of waste; control, monitoring and regulation of the production of waste; prevention of waste production through in-process modifications, reuse and recycling.

Wastewater: water that carries wastes from homes, businesses and industries. It is usually a mixture of water and dissolved or suspended solids.

Wastewater treatment plant: a facility containing a series of tanks, screens, filters, and other processes by which pollutants are removed from water.

Water quality: a term used to describe the chemical, physical, and biological characteristics of water with respect to its suitability for a particular use.

Wetlands: lands where water saturation is the dominant factor that determines the nature of soil development and the types of plant and animal communities living in the surrounding environment. Other common names for wetlands are bogs, ponds, estuaries and marshes.

SOME INTERNET USEFUL SITES

IOC, Sport and environment commission:

http://www.olympic.org/uk/organisation/commissions/environment/index_uk.asp

United Nations Environmental Programme (UNEP):

<http://www.unep.org/>

UNEP Agenda 21

<http://www.un.org/esa/sustdev/agenda21.htm>

UNEP sport and environmental programme

http://www.unep.org/cpi/sport_env/

Green Games 2000, a section of the Environment Australia web site providing a detailed insight into the policies and practice behind the creation of the Green Games.

<http://www.ea.gov.au/events/greengames/index.html>

Athens 2004: environment

<http://www.athens.olympics.org/page/default.asp?a=2&id=9>

Torino 2006: environment

<http://www.torino2006.org/ambiente/content.php?idm=100011>

International Academic of Sport Science and Technology, EPFL, Lausanne:

<http://www.aists.org/>

Olympic Studies Centre (UAB) and the International Chair in Olympism (IOC-UAB), University of Barcelona:

<http://olympicstudies.uab.es/eng/index.html>

Greenpeace Olympic environmental guidelines:

<http://www.greenpeace.org.au/archives/olympics/reports/newguidelines.pdf>

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