SUSTAIN-T

Sustainable Tourism through Networking and Collaboration

Module 4:

Sustainable tourism benefits to the environment

Module 4. Sustainable tourism benefits to the environment

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Keywords: *energy, water, pollution, waste, climate change, biodiversity, conservation*.

Learning objectives	*As a result of engaging with the materials in this module, learners are intended to achieve the following learning outcomes:* ***Knowledge****: learn what are the main topics related to environmental management, that tourism MSEs can take into account, particularly water and energy conservation, reducing pollution, and conserving biodiversity, ecosystems and landscapes.* ***Skills****: improved ability to identify the main environmental management tools for tourism MSEs, and how they can be implemented.* ***Competencies****: encourage the environmental management of tourism MSE in order to make them more environmentally sustainable.*
Methods	*Autonomous learning by reading and studying the course materials and the complementary sources and links provided in the materials.*
Time schedule	*Time necessary for:* *Learning content (self-study): 1.5 hours* *Self-assessment questions: 5 minutes* *Additional time (depending on learners) is required to complete the learning activities and review complementary sources and links*

Introduction

Practices of sustainable tourism in MSEs can produce substantial benefits to the environment. This module focuses on a number of environmental vectors, (water, energy, climate, pollution, wastes, and biodiversity), to show how conservation efforts at the scale of these MSEs may result not only in the improvement of their sustainability performance but also in the improvement of their businesses through, for example, reductions of economic costs. Given the high heterogeneity of tourism MSEs, (some with establishments for tourism accommodation and others which carry out activities that do not need this type of infrastructure), an effort has to be made regarding the applicability of some of the actions proposed, bearing in mind that not all the possibilities for sustainable action described in the module will be tailored to all tourism MSEs.

Water and energy conservation imply two broad, complementary strategies. First, the increase of efficiency in use through technology but also through changes in human behaviour regarding consumption. The second strategy involves the use of alternative resources, for instance renewable energies or rainwater or recycled water. Both strategies may lead to potentially very important environmental and economic benefits, (reduced water and energy consumption; use of carbon neutral energies; improvements in freshwater ecosystems, etc.).
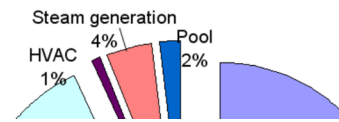
The reduction of pollution and wastes associated to the activities of tourism MSEs also improves their environmental record. Appropriate technologies but especially behaviours, (very important in the case of waste minimization, appear again as strategies to pursue. MSEs may follow actions with multiple benefits. For example, climate change mitigation, (i.e. reducing emissions of pollutants contributing to global warming), may be achieved by reducing energy and water use which also reduces other forms of pollution as well as associated economic costs. Waste minimisation influences most forms of pollution, including contributions to global warming.

Finally, biodiversity and landscape conservation by tourism MSEs contributes to sustainability by introducing the perspectives of ecosystem services and of carrying capacity into conservation and therefore linking more closely economic and environmental objectives.
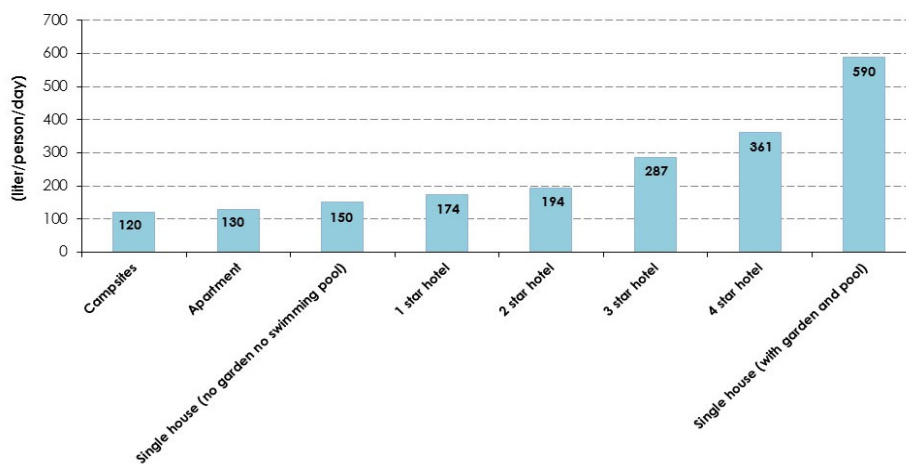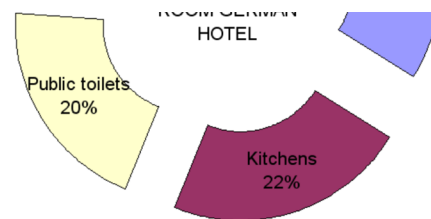
Content

4.1 Conserving resources: water

Figure 1. *Water use from sub-meter data in a 300-room hotel in Germany using 620 litres of water per guest-night.*
Source: *European Commission (2012). Reference Document on Best Environmental Management Practice in the Tourism Sector Final Draft June 2012.*

Overall, water consumption by tourism is higher than in the domestic sector. A European tourist consumes around 300 litres of water per day whereas a European resident would consume approximately 150 litres per day. There are different reasons that explain this difference: garden irrigation in hotels; presence of swimming pools and other water related facilities (jacuzzis, spas); daily room cleaning and laundry; intensive kitchen activities, and a behavioural aspect linked to pleasure such as taking baths or spending more time under a shower. Figure 1 shows the distribution of water consumption in a 300 room German hotel. It can be seen how over a third of the consumption takes place in guest rooms. On the other hand, the combination of kitchen and laundry uses approaches 40 percent of the total consumption.

Figure 2. *Water consumption for different types of tourism accommodation (averages, 2003).*
Source*: Rico et al. (2009).*

Water consumption per capita may also vary significantly according to the type of tourist establishment. For example, in the case of Benidorm, Spain, this consumption on average ranges from 120 litres/person/day (lpd) in campsites to almost 600 lpd in villas with gardens and swimming pools. In the case of hotels, water consumption tends to correlate with hotel category. Hence, establishments with more stars tend to use more water than establishments with fewer stars.

Efficiency in water use can be improved by two basic approaches closely interconnected: technology and behaviour. In the case of technology, there are currently many systems addressed to improve

the performance of the multiple fixtures present in guest rooms and facilities such as pressure reducers in taps; flow aerators in showers or dual flushing toilets. Likewise, modern laundry and kitchens spend less water per unit processed than in the past. The effectiveness of most of these systems however also depends on behaviour by users. This is why communication regarding conservation is very relevant, especially in the bathroom.

One of the most important principles in domestic and tourism water management is to acknowledge that not all water uses require maximum potable quality. Hence, some uses such as toilet flushing, general cleaning or garden irrigation, (all adding up to an important part to overall water consumption), can be satisfied with water of less quality than potable water. This water may come from the outside, (rainwater), or can be generated inside (grey water obtained from baths, showers or hand basins).

Learning activity 4.1:
Do you try to integrate measures (technological and/or behavioural) to reduce water consumption in your enterprise? If yes, give examples of how you do it. If not, indicate the main challenges.
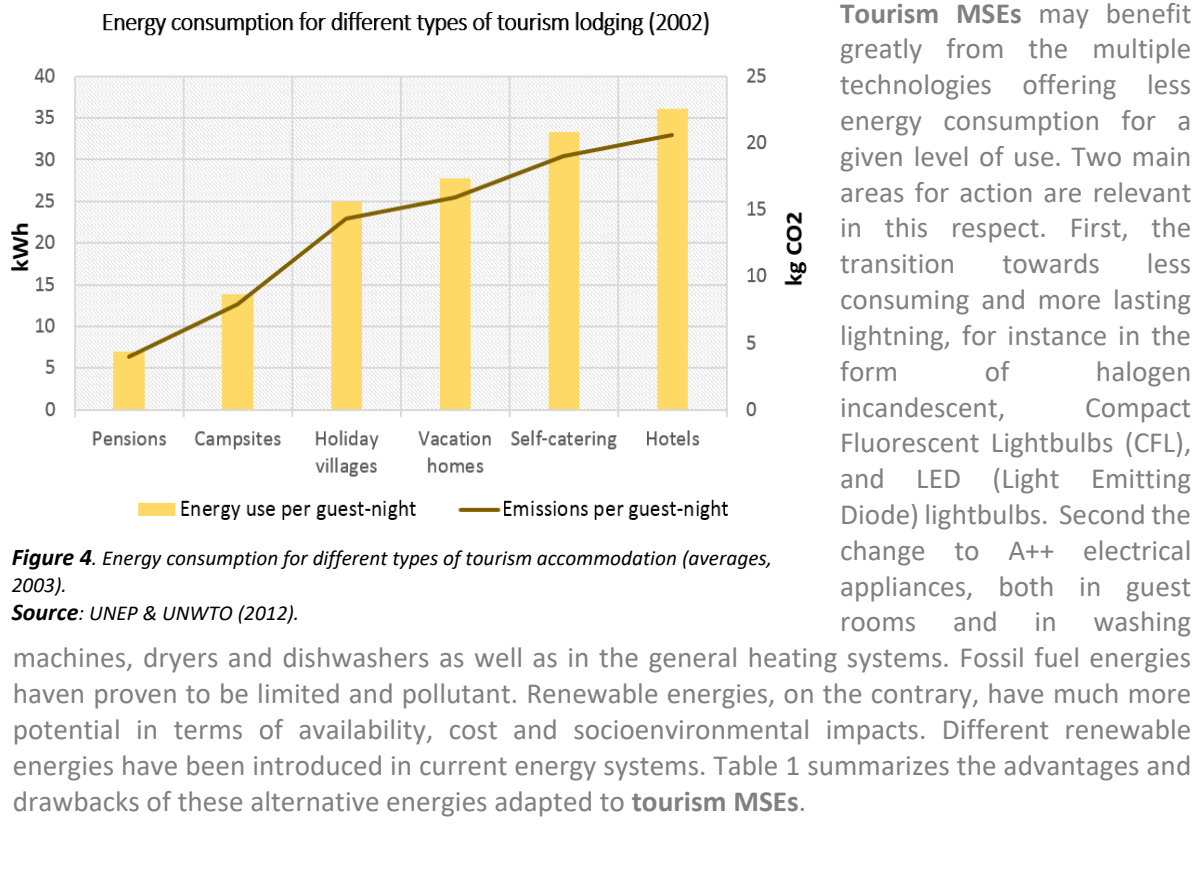
4.2 Conserving resources: energy

Energy consumption by tourists also tends to be higher than consumption by residents, and tourism accommodation, in particular, has become one of the most energy demanding sectors. Energy use in accommodation includes space heating and/or cooling, lighting, cooking (in restaurants), cleaning, swimming pools and sanitary hot water. Figure 3 represents the distribution of energy consumption regarding accommodation. From the figure it can be seen how heating and hot water concentrate most of the consumption, followed by cooling and lighting. Because of its relevance for lighting and HVAC systems, electricity stands as the most important energy vector in tourist accommodations. As in water consumption, energy consumption varies according to accommodation types (Figure 4). Consumption will depend on the existence of facilities like swimming pools or spas or on the electric appliances in guest rooms more common in hotels than in other accommodation types.
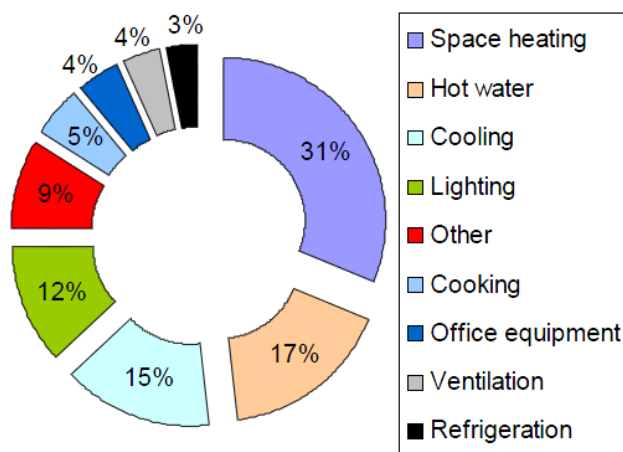
Figure 3. *Energy consumption for different types of tourism accommodation (averages, 2003).*
Source: *European Commission (2012).*

Figure 4. *Energy consumption for different types of tourism accommodation (averages, 2003).*
Source: *UNEP & UNWTO (2012).*

Tourism MSEs may benefit greatly from the multiple technologies offering less energy consumption for a given level of use. Two main areas for action are relevant in this respect. First, the transition towards less consuming and more lasting lightning, for instance in the form of halogen incandescent, Compact Fluorescent Lightbulbs (CFL), and LED (Light Emitting Diode) lightbulbs. Second the change to A++ electrical appliances, both in guest rooms and in washing machines, dryers and dishwashers as well as in the general heating systems. Fossil fuel energies haven proven to be limited and pollutant. Renewable energies, on the contrary, have much more potential in terms of availability, cost and socioenvironmental impacts. Different renewable energies have been introduced in current energy systems. Table 1 summarizes the advantages and drawbacks of these alternative energies adapted to **tourism MSEs**.

WIND ENERGY		SOLAR ENERGY	
Positive	**Negative**	**Positive**	**Negative**
No air or water pollution	High initial costs	No air or water pollution	High manufacturing costs
Easy accessibility	Non-reliable resource	Easy accessibility	Use of rare materials
Negligible impact on climate change	Landscape impacts	Low maintenance cost	Landscape impact
Unlimited resource	Acoustic impacts	Lower electricity bills	Weather dependent
Efficient technology	Threat to wildlife (birds)	Unlimited resource	Low energy efficiency
Low operational costs	Electromagnetic interferences	Negligible impacts on climate change	May require water of very good quality
Small scale potential	Specific sites		

BIOMASS		GEOTHERMAL ENERGY	
Positive	**Negative**	**Positive**	**Negative**
Contribution to rural land use management	Large space requirements (crops)	No air or water pollutant	High cost for electricity
Simple technologies	Risk of deforestation	Direct use	Need of adequate geological conditions
Carbon neutral	Energy consumption increases with humidity	Stable resource	High initial cost
Low cost	Requires a great deal of water	Great savings in cooling and heating	Associated energy cost of the pump
Advanced technology		Abundant supply	Not many potential sites

Water and energy conservation efforts should not be treated in isolation since improvements in energy efficiency often imply a reduction in water consumption and vice-versa. For example, consuming less water implies less need for electricity to heat water for baths and showers, washing machines, dishwashers, etc. Furthermore, the energy needed for water heating can be supplied by renewable energies like solar panels that imply a decrease on conventional fossil fuel energy sources and a reduction in gases contributing to global warming. In addition, having good maintenance programs of water installations can avoid energy losses.

For **tourism MSEs** the joint management of water and energy sources and uses may present multiple benefits. One of such benefits is economic cost reduction. By identifying possible inefficiencies in both the water and energy systems and correcting those accordingly, **tourism MSEs** can save money in water, electricity and fuel bills. By recycling water or using rainwater for certain functions and by moving to renewable energies, **tourism MSEs** can also contribute to the optimisation of water and energy relationships thus reducing environmental impacts especially the emissions of greenhouse gases to the atmosphere. Finally, **tourism MSEs** may play an important educational role for urban users in terms of the dissemination of the water energy nexus approach.

Learning activity 4.2:
Do you try to integrate measures (technological and/or behavioural) to reduce energy consumption in your enterprise? If yes, give examples of how you do it. If not, indicate the main challenges.

4.3 Reducing pollution: greenhouse gas emission, wastewater, solid waste

The average temperature of the planet is rising and scientific evidence almost indisputably assigns this increase to human activities by means of the so called "greenhouse gases" (GHG). The atmosphere of the Earth effectively acts as a greenhouse in the sense that allows heat in, but traps gases emitted from the Earth thus warming the atmosphere. Without the greenhouse effect, life in the planet as we know it would not exist but excess concentrations of gases contributing to the greenhouse effect, (carbon dioxide (CO_2), methane, nitrogen oxides, water vapour and others), cause temperatures to rise which, in turn, may produce potentially catastrophic events such as sea level rise; increase in the frequency and impacts of extreme events (floods, droughts, hurricanes, etc.), habitat and species destruction and multiple socioeconomic shocks. Carbon dioxide, mostly generated by the combustion of fossil fuels, is responsible of 60% of warming and has become therefore one of the main targets in policies for the reduction of emissions. The international community is taking concerted action against climate change around a commonly agreed framework led by the United Nations, but climate change can be tackled also at the local or even smaller levels such as **tourism MSEs**. One of the major objectives is to reduce the carbon footprint in all human activities.

Tourism contributes to climate change but also suffers its impacts. Tourism is estimated to account for 5% of global CO_2 emissions, 40 % of which derive from air transport and 20% from hotels and other types of accommodation. Emissions from accommodation are related to heating, air-conditioning and the maintenance of bars, restaurants, pools and vary according to the location and size as well as the type of establishments and additional facilities. The remaining 40% is related to other types of transport, (cruises, cars, railway, etc.), and to the recreational services provided by tourism.

Since some of the most negative consequences of climate change, (water scarcity, pollution, habitat and landscape degradation; endangered species, etc.) may affect directly **tourism MSEs**, the latter have to develop actions of mitigation but also of adaptation to climate change. Therefore, MSEs should reduce GHG emissions, adapt their businesses and activities to changing climate conditions and apply existing and new technologies to improve energy, water and waste efficiency so that the carbon footprint is reduced. The United Nations World Tourism Organization (UNWTO) has set four main goals out in order to guide MSEs into the greening and decarbonising of the sector:

- Understanding the size of the problem. As the number of tourists is expected to grow in the next years, GHG emissions are also expected to rise rapidly, especially in tourist modalities such as rural or nature tourism now in high demand and where MSEs are dominant.
- Warning about the problem. **Tourism MSEs** must be prepared to face the main consequences of climate change most critically in identifying early manifestations of change, (jellyfish in beaches indicating warmer waters, shorter ski seasons; increasing presence of non-local species in traditional ecosystems, etc).
- Adapting to the problem, especially to new environmental conditions by reducing water and energy consumption, use alternative sources, minimise and recycle wastes and contribute to carbon offsets through, for instance, gardening and ecosystem conservation.
- Reacting to the problem by joining wider networks for the promotion of sustainable tourism.

Waste water is defined as water used that contains dissolved or suspended solids from houses, business, industries, agricultural practices and other human activities.

Waste water may contain different organic and inorganic substances and concentrations of metals and other compounds that can travel long distances and affect human and ecosystem health if not treated correctly. Figure 5 shows different waste water cycles and possibilities regarding final destination.
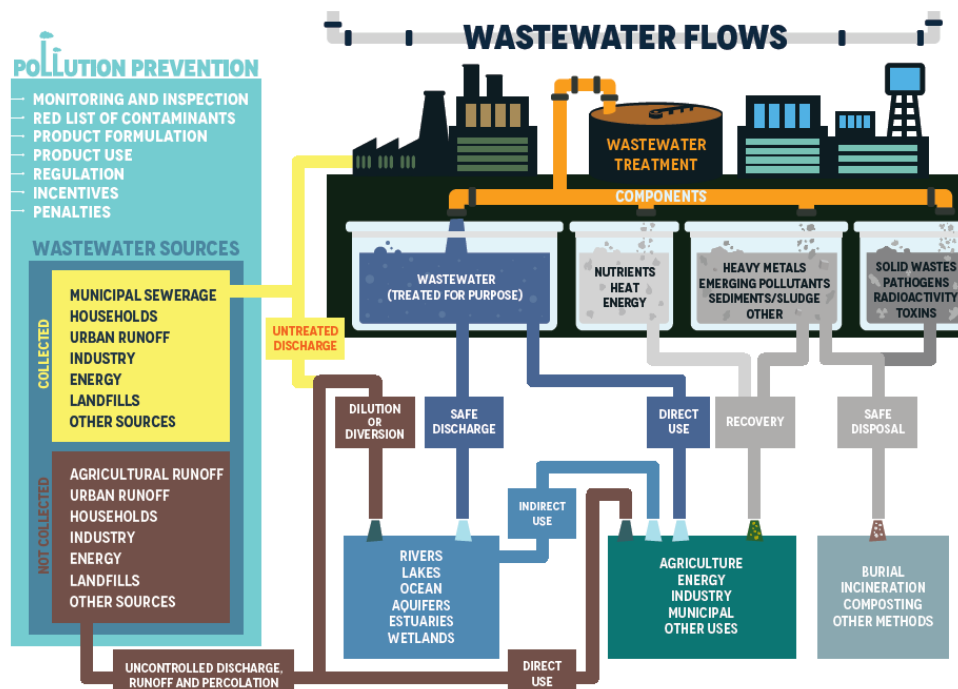
Figure 5. *Wastewater system scheme*
Source: *UNESCO (2017).*

Waste water remains as an undervalued resource. In the framework of circular economy and of increasing water scarcity, waste water attains a new and critical role also for **tourism MSEs**. Minimisation and recycling of waste water can be summarised in three steps:

- **Prevention**. In terms of pollution type and loads. MSEs should control the quality of their waste waters in order to reduce or eliminate certain contaminants as well as develop campaigns addressed to guests aimed at reduce water consumption and, in consequence, reduce waste water generation.
- **Treatment**. Installing on-site optimised waste water treatment systems. One interesting approach is to use a biological system in which the vegetation is responsible for improving the quality of the effluent.
- **Reuse**. Two possibilities can be considered. One is to recirculate on site grey water to fill WC cisterns after a previous, basic on-site depuration system. This measure may imply reducing 35% to 45% water from the network. Another alternative system is to use reclaimed water from a waste water treatment plant. This water may also be used for WC cisterns, irrigation, cleaning and other uses that do not require a potable quality.

Every international tourist in Europe generates at least 1 kg of solid waste per day, and up to 2 kg/person/day in the United States (UNEP, 2003). Tourists may generate up to twice the amount of solid waste per capita compared to local residents (IFC, 2007) and bring with them their demands and lifestyles that replicate waste generation patterns of their places of origin. Therefore, changes are not simply of quantity, but also of composition, including organic and hazardous elements of high environmental impacts upon disposal. Accommodation and restaurants are major contributors to packaging waste, (Eurostat, 2010), including plastics and metals with high embodied energy content. Furthermore, tourism wastes often vary seasonally, and are generated in areas sensitive to littering, adding pressure on waste management facilities during peak seasons and damaging highly valuable resources. The quantity of waste also varies depending on the accommodation type.
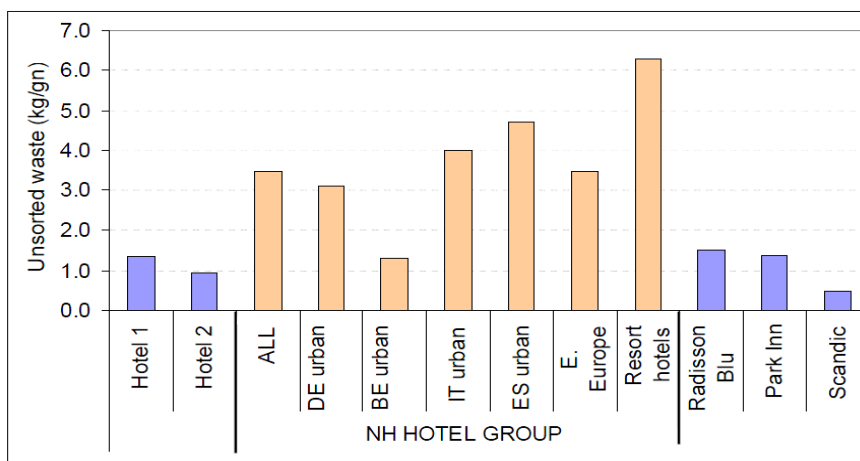

Figure 6 shows unsorted waste generation per guest and night for different groups and types of hotels. In general, the bigger the accommodation type, the more wastes it generates. Differences among hotels from the same group may be explained because of the waste management system of each municipality.

Figure 6. *Waste generation according to different types of lodging*
Source: *European Commission (2012).*

Solid wastes are the main source of environmental pollution and they must have a precise management in order to avoid being dumped in an unauthorised site. Solid wastes imply the consumption of more energy and resources to replace them; consequently, more GHG would be released throughout wastes long degradation time.

The waste policy of the European Union has evolved in the last years shifting away from thinking about waste as an unwanted burden to seeing it as a valued resource and key to circular economy. Therefore, a waste hierarchy has been established based on the "Three R rule", which can be applied in all tourism facilities.

Figure 7. *Waste hierarchy*
Source: *European Commission, Environment (2016).*

Figure 7 presents the steps that should be followed, from the top to the bottom, disposal being the less desirable option. Waste management practices in **tourism MSEs** should focus on:

- **Reduce** the consumption of products. Encourage suppliers to provide products limiting packaging and reducing toxic materials. Replace current processes that generate more waste for processes with less environmental impacts. Purchases can be done jointly with other buyers in order to reduce individual and small packaging. Avoid using plastic or throwaway products (bottles, jars…) and start using glass bottles, soap dispensers, etc.
- **Reuse** material whenever is possible. Reuse and repurpose products for alternative uses (like scrap metal into art). Buy products with returnable bottles and rechargeable batteries. Use organic wastes as fertiliser and used paper as notebook, and print on both sides. Avoid using letters or papers to inform the staff, use boards instead.
- **Recycle** when re-use is not possible. Having a good waste sorting system facilitates recycling management. Using recycled materials and arranging recycling trash bins within the tourist facilities.

The causes and consequences of climate change and pollution not only affect the environment, but also affect the tourism sector. Pollution affects biodiversity and generates greenhouse gases. **Tourism MSEs** should measure and control GHG emissions and carry out actions to reduce or compensate them. Wastewater must be subjected to an effective treatment leading towards reuse. Harmful substances should not be used, and solid wastes must have a management plan with quantitatively expressed goals and best practices.

Learning activity 4.3:
Do you try to integrate measures (technological and/or behavioural) to reduce waste production in your enterprise? If yes, give examples of how you do it. If not, indicate the main challenges.

4.4 Conserving biodiversity, ecosystems and landscapes

Contributing to the conservation of biodiversity in ecosystems and landscapes, including landscapes of human origin, is a fundamental task of **tourism MSEs** especially if they are located in or near protected areas, (Natural Parks, Natural Reserves, etc.) and want to promote activities related to ecotourism. Biodiversity conservation in Europe is still far from optimal. Overall, only about a third of habitats are in a relatively good state, making evident the necessity to improve the current situation (European Environment Agency, 2015). By devising plans and actions addressed at promoting biodiversity conservation and enhancement, **tourism MSEs** can become a major player in ensuring the sustainability of natural areas.

The conservation of biodiversity, ecosystems and landscapes is even more urgent if we take into account that healthy ecosystems provide resources and offer services that are essential in economic and social terms. Well preserved and diverse ecosystems and landscapes may offer an important number of benefits such as the following:

- Ecosystem services. For example, protection of water and soil resources, storage and recycling of nutrients, absorption of pollution from plants (CO_2), and capacity to resist and recover from perturbations
- Biological resources. For example, food, water, energy, medicines, wood products, ornamental plants, genes, etc.)
- Social benefits. For example, research, education, tourism, leisure and cultural activities.

Biodiversity and tourism have much to benefit from each other. The Convention on Biological Diversity (CBD) has recognized tourism as an important factor for biodiversity and as a positive force for conservation but also as a source of harmful impacts if not effectively managed. In this sense, the expansion of tourism into new destinations has mostly proceeded at the expense of social and environmental impacts, and of biodiversity conservation.

Therefore, **tourism MSEs** should promote the conservation of biodiversity, ecosystems and landscapes because of the following reasons:

- Degraded or polluted ecosystems may hamper outdoor and nature related activities of which tourism is highly dependent.
- Practitioners of ecotourism, or a type of tourism based primarily on the quality of natural ecosystems and landscapes, become more demanding with time regarding the conservation of these spaces. If natural areas are not well protected or managed ecotourism activities may diminish or disappear with negative effects for MSEs.
- Ecosystems and landscapes of human origin may embody an important biodiversity source and need to be conserved as well. Gardens and green areas created by **tourism MSEs** constitute ecosystems as well and offer important environmental services to the tourist sector, for instance in providing habitats for a number of species and in reducing energy consumption of air conditioned in summer by providing shade and other cooling mechanisms.

In preserving biodiversity, ecosystems and landscapes **tourism MSEs** should also be aware of the fragility of the natural environment, especially in what concerns the ability of certain ecosystems or

landscapes to sustain a certain number of visitors. Tourism and especially ecotourism is an activity in constant growth and increasing numbers of visitors in natural areas may jeopardise the very future of this area. **Tourism MSEs** that organize activities that are highly dependent on natural values or ecosystem services should be aware of the concept of *carrying capacity*. This concept refers to the threshold above which certain natural or cultural features, (a species, a landscape or a piece of art, for instance), might not sustain additional amounts of visitors, entering in a process of degradation, and therefore losing its value and attractiveness. However, the determination of this threshold is always difficult and constantly subject to change.

The evaluation of biodiversity conditions and of the pressures exerted by tourism on ecosystems and landscapes is less open to quantification than the evaluation of other environmental pressures such as energy and water consumption, waste generation and air or water pollution. For **tourism MSEs** the use of indicators capable of representing ecosystem services and that are meaningful to visitors is a challenging task. However, initiatives such as the definition of 24 ecosystem services by the "Millenium Ecosystem Assessment" report (MEA), involving the application of scientific methodologies focused on essential processes, functions and interactions among organisms and their environment, may provide important hints for tourism. Some of these ecosystem services are cultural and highly valuable for tourists interested in traditional resource management methods, (hunting and fishing practices, for instance). In this sense, **tourism MSEs** focusing, for instance, on the conservation of traditional landscapes may contribute also to enhance the number of ecosystem services. Thus, farm tourism may recreate certain forms of land use management able to offer a variety of food producing ecosystems each one with its own set of services.

A mutually beneficial relationship between **tourism MSEs** and biodiversity conservation could be designed along the following axis:

- Implement a biodiversity conservation and management plan that protects and enhances biodiversity within the destination through, for example, compensation packages for activities potentially affected by conservation programs.
- Promote gardens and other ecosystems of human origin within the facilities of the MSEs. This garden should be based on local species, attempt to attract wild fauna and if it is possible, use rain water or grey water for watering.
- Control ecosystem quality by monitoring and avoiding the spread of invasive species.
- Establish programs to recover, if possible, old ecosystems and landscapes (for example "agroecosystems") known for their high biodiversity values combining natural and cultural elements.
- Estimate the recommended carrying capacity, (in terms of, say, daily visitors), for especially fragile natural and cultural landscapes.

In sum, biodiversity conservation, protecting habitats, ecosystems and landscapes, is a fundamental endeavour for **tourism MSEs** especially those that depend on the natural environment for their activities. MSEs can benefit from conservation practices and from the goods and services provided by healthy ecosystems and landscapes. At the same time **tourism MSEs** can contribute to the creation of new ecosystems, (gardens, green areas, etc.) enhancing the number and scope of existing services.

Learning activity 4.4:

Does your enterprise implement measures to protect ecosystems and landscapes? If yes, give examples of how you do it. If not, indicate the main challenges.

Useful links	
	https://www.e-unwto.org/doi/pdf/10.18111/9789284415038 Energy efficiency solutions for MSE hotels from the World Tourism Organization.
	https://www.e-unwto.org/doi/pdf/10.18111/9789284415052 Renewable energy solutions for MSE hotels from the World Tourism Organization.
	https://www.e-unwto.org/doi/book/10.18111/9789284419425 Low-carbon Growth Opportunities in Tourism. How to reduce emissions in this sector.
	http://sdt.unwto.org/en/content/faq-climate-change-and-tourism Summary of climate change concepts and recommendations for climate mitigation in tourism. Explanation of the concept "carbon neutral policy".
	https://www.e-unwto.org/doi/pdf/10.18111/9789284412341 Impacts of tourism on water and other resources and recommendations.
	https://www.cbd.int/tourism/ Information to achieve sustainable tourism activities in protected areas.

Summary of key points

- Water and energy consumption are higher for tourist guests than residents and vary among different types of accommodation.
- Reducing water and energy consumption through technology, behaviour and alternative resources is an opportunity to protect local communities and environments while reducing economic costs as well.
- Climate change is perhaps the most important effect of global pollution with important repercussion on tourism. Tourism MSEs should mitigate and adapt to climate change and its consequences.
- Waste water must be correctly treated and reused if possible.
- The management of solid wastes should follow three "R" rule of reduce, re-use and recycle.
- Biodiversity conservation could benefit from the expansion of ecotourism-based MSEs, but the carrying capacity of fragile environments should be considered.

Integrative learning activity for Module 4: Position Paper

Systematise the reflections you made while engaging with the module materials. Outline the aspects, which need to be considered for your enterprise to improve its sustainability performance.

Indicative structure:
1. General awareness of the sustainable tourism benefits to the environment and the way you apply them in your business operations;
2. Strengths integrating measures to reduce the consumption (water, energy) directly in your enterprise and/or indirectly in the tourist activity you promote;
3. *Strengths integrating measures to reduce the solid waste production directly in your enterprise and/or indirectly in the tourist activity you promote;*
4*. Strengths of your enterprise implementing measures to protect ecosystems and landscapes;*
5. Weaknesses hindering the reduction of the water, energy consumption;
6. Weaknesses hindering the reduction of the solid waste production;
7. Weaknesses hindering the protection of ecosystems and landscapes;
8. Particular consideration of behavior measures in your business operations (employees and customers) as an important driver for changing habits and reducing environmental impacts.

Bibliography	
1.	Convention on Biological Diversity (2015). *Tourism Supporting Biodiversity - A Manual on Applying the CBD Guidelines on Biodiversity and Tourism Development.*
2.	European Commission (2010). *Being Wise with Waste: the EU's Approach to Waste Management.*
3.	European Commission (2012). *Reference Document on Best Environmental Management Practice in the Tourism Sector Final Draft June 2012.*
4.	European Commission, Environment (2016). *Directive 2008/98/EC on Waste (Waste Framework Directive).* Retrieved from: http://ec.europa.eu/environment/waste/framework/
5.	European Commission, Environment. *Why do we Need to Protect Biodiversity?* Retrieved from: http://ec.europa.eu/environment/nature/biodiversity/intro/index_en.htm
6.	European Environment Agency (2015). *Biodiversity.* Retrieved from: https://www.eea.europa.eu/soer-2015/europe/biodiversity#tab-
7.	Global Sustainable Tourism Council (2016). *GSTC Hotel Criteria Version 3, Suggested Performance Indicators.*
8.	Rainforest Alliance (2010). *Guide for Sustainable Tourism Best Practices.*
9.	Rico Amorós, A.M.; Olcina Cantos, J. & Saurí, D. (2009). Tourist Land Use Patterns and Water Demand: Evidence from the Western Mediterranean. *Land Use Policy*, 26, 493-501.

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10.	United Nations Educational, Scientific and Cultural Organization (2017). *WASTE WATER THE UNTAPPED RESOURCE. The United Nations World Water Development Report 2017.*
11.	United Nations Environment Programme (UNEP) and World Tourism Organization (UNWTO) (2012). *Tourism in the Green Economy – Background Report.*
12.	United Nations Environment Programme (UNEP), & World Tourism Organization (UNWTO) (2008). *Climate Change and Tourism – Responding to Global Challenges.*
13.	U.S. Energy Information Administration (2018). *What is Energy?* Retrieved from: https://www.eia.gov/energyexplained/index.php?page=about_home
14.	World Tourism Organization (2007). *Tourism & Climate Change - Confronting the Common Challenges - UNWTO Preliminary Considerations -October 2007.*
15.	World Tourism Organization (2010). *Tourism and Biodiversity - World Tourism Day 2010 - Special Edition.*
16.	World Tourism Organization (UNWTO). *Tourism & Sustainable Energy: Powering Sustainable Development.* Retrieved from: http://wtd.unwto.org/en/content/tourism-sustainable-energy-powering-sustainable-development

Glossary	
Water conservation	Conscious activity to achieve a certain level of goods and services with less water or by using water from non-conventional sources (rainwater, recycled water).
Energy conservation	Conscious activity to achieve a certain level of goods and services with less energy or by using energy from renewable sources.
Carbon footprint	Analytic tool that calculates total greenhouse gases emissions for a specific activity. It quantifies the magnitude of the activity impact on global warming.
Global warming	The upward temperature trend across the Earth since the mid 20th century due to the increase in fossil fuel emissions.
Mitigation and adaptation	Mitigation: Policy addressed to curb the emissions of greenhouse gases contributing to climate change. Adaptation: Policy addressed to minimise or reduce the impacts of climate change.
Wastewater treatment	Water management option that speeds up the natural processes by which water is purified. It involves primary treatment (removing solids), secondary treatment (removing organic matter) and, sometimes, tertiary treatment (preparing for reuse).

Ecosystem services approach	Approach that attempts to put value on services provided by ecosystems such as clean air and water; support of flora and fauna; nutrient production, climate regulation, and also cultural elements such as recreation or education.

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