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Toolkit Part 1: Learning Outcomes and Modules

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1 About the toolkit

This toolkit comprises the learning materials for public authorities to build capacity & support policy transfer on sustainable tourism water management, developed within the context of the CASTWATER project. CASTWATER is a project aiming to provide means for managing environmental risks linked to tourism activities in the CASTWATER area, supporting sustainable tourism water management and generating the dynamic involvement of public authorities, and the tourism sector as a whole, with a particular emphasis on tourism SMEs. This toolkit will enable public sector members (managers or employees) to understand key aspects of how to assess, promote and support water sustainability in tourism across their territories. To this end, the CASTWATER partnership conducted the following number of studies to identify data gaps, relevant needs, potential impact, best practices and policies in the CASTWATER area:

- A3.2 Sustainable tourism water management needs assessment in the partnership touristic areas;
- A3.3 Investigating the policy framework for sustainable tourism water management in the partnership areas;
- A3.4 Exploring the potential impact of the adoption of water efficiency solutions by the tourism sector;
- A3.5 Collection of good practices and case studies on sustainable tourism water management;
- A3.6 Elaboration of tourism water sustainability indicators & evaluation criteria;
- A3.7 Elaboration of an online tool to monitor and assess "Sustainable Tourism Water Management".

The results of the studies were then used to develop common tools capable of:

a) providing data through tourism SMEs' self-assessment, so as to promote an understanding of their perspectives about water efficiency, and

b) providing the necessary knowledge to public authorities' to make the necessary interventions that will promote water sustainability in tourism.

This toolkit addresses point b) of the previous paragraph, and is described in the CASTWATER application form (activity A3.8) as developing "*learning & knowledge resources on sustainable tourism water management for public authorities to improve their capacity to address sustainable tourism water management issues in their territories. These resources will address the needs of PAs staff to understand the policy & practice framework of tourism water sustainability, promote public awareness, provide financial & other incentives to SMEs, address conflict resolution etc*".

Using the toolkit, alongside the remaining CASTWATER outcomes, is expected to ensure the following:

- Public authorities in the partnership's coastal areas will achieve increased capacity building towards monitoring and measuring systematically and effectively the level of water sustainability of tourism activities in their areas; with the aim to improve water efficiency while supporting the minimisation of hydrological stress linked to tourism activities in the territories concerned. It is expected that 100 public authorities will improve their capacity to monitor and support tourism water sustainability in the partnership coastal areas the first year after the project's implementation.

- Tourism SMEs in the partnership areas are expected to develop increased sustainable water management capability in order to fundamentally improve their water sustainability performance. Moreover, they will understand their water consumption patterns and eventually adopt modern water saving measures related to their activities. It is envisaged that more than 1000 enterprises in the tourism sector will improve their capacity to self-assess their water sustainability during and after the project's implementation by adopting water efficiency measures, solutions and relevant staff training.

- Relevant public authorities will improve their capacity to transfer data and knowledge acquired within the context of the project activities into regional or local plans and measures. It is expected that more than 1000 local public authorities in the partnership countries will improve knowledge and efforts to transfer the sustainable tourism water management approach into their development and implementation of policy plans.

To describe the toolkit in a more precise way, it is important to point out that it is comprised of the following parts:

1. This deliverable provides a textual guidance of the toolkit and the associated learning/teaching material. The first section presents the objectives of the toolkit and the key learning outcomes that public authorities' and partners are expected to attain by using it. It then illustrates the learning modules of the toolkit which largely correspond to and present the conclusions of the studying activities of the CASTWATER project, as they were encapsulated in the following deliverables:

   - D3.2.1 - Sustainable tourism water management needs assessment in the partnership touristic areas;
   - Methodology and Tools for the preparation of D3.3.1: Investigation of the policy framework for sustainable tourism water management in the partnership areas;
   - D3.3.1 Policy analysis report on sustainable tourism water management in the partnership countries;
   - D3.4.1 - SWOT and impact analysis on the adoption of water efficiency and management solutions by the tourism sector;

- D3.5.1 - Good practice guide on the adoption of sustainable tourism water management solutions by SMEs;
- D3.6.1 Indicators List For the Evaluation of Tourism Water Management Efforts in Partnership Areas;
- D3.7.1 Specifications for the CASTWATER online tool.

The modules cover theoretical and conceptual issues and include practical examples where possible. Infographics were embedded in the text where suitable to highlight key points.

2. The second part of the toolkit, which can be found in **Annex 1**, consists of assessment materials designed to facilitate the evaluation of knowledge acquisition. The materials consist of exercises delivered for every single module, enabling learners to customise their personal learning trajectory according to their needs and priorities.

3. The third part of the toolkit, which can be found in **Annex 2**, consists of presentations prepared in PowerPoint format that combine text and visuals to summarise, outline and explain the modules of the toolkit.

4. The final part of the toolkit, which can be found in **Annex 3**, consists of specific best practices of water sustainability in tourism businesses that have already been undertaken across the Mediterranean.

2 Learning objectives and learning outcomes

After reading this toolkit, public sector employees will be able to attain the following learning objectives:

- Develop an understanding of key aspects of improving water sustainability in tourism businesses and SMEs in the Mediterranean.
- Create awareness of related best practices applied to water conservation in the tourism industry across the Mediterranean.
- Use of the CASTWATER online tool.
- Develop the capability to define and/or implement informed policy measures based on an understanding of all the key aspects of improving water sustainability in the tourism sector in the Mediterranean, with a particular focus on SMEs.

In order for the above learning objectives to be achieved, public sector representatives and employees are expected to attain the following learning outcomes of this deliverable:

Table 1: Presentation of the CASTWATER toolkit learning outcomes

CASTWATER toolkit learning outcomes
Module 1 ***Learning the characteristics of integrated water resource management (IWRM) in the tourism sector***
▪ Understand the need for sustainable integrated water resource management and water policy in tourism. ▪ Learn the definition and characteristics of sustainable integrated water resource management in tourism. ▪ Describe types of measures supporting and promoting sustainable integrated water resource management in tourism SMEs and businesses. ▪ Learn about policy interventions proposed by CASTWATER that support and promote sustainable integrated water resource management in tourism SMEs and businesses.
Module 2 ***SWOT analysis of the process of adopting water efficiency and management solutions by the tourism sector***
▪ Understand the impact of political factors to the adoption of water efficient solutions by tourism SMEs. ▪ Understand the impact of economic factors to the adoption of water efficient solutions by tourism SMEs. ▪ Understand the impact of socio-cultural factors to the adoption of water efficient solutions by tourism SMEs.

- Understand the impact of technological developments to the adoption of water efficient solutions by tourism SMEs.
- Understand the impact of environmental factors to the adoption of water efficient solutions by tourism SMEs.
- Understand the impact of legal factors to the adoption of water efficient solutions by tourism SMEs.
- Understand the rationale for conducting a PESTEL analysis of the process of adopting water efficient solutions in tourism.

Module 3

Learning best practices for the adoption of sustainable tourism water management solutions by SMEs

- Learn strategies and measures increasing water efficiency in tourism by increasing the availability of water and/or adjusting water demand and reducing water consumption.
- Learn the most popular water management solutions among tourism SMEs.
- Learn the most common problems encountered during the implementation of water efficiency solutions in tourism.
- Learn the key enablers facilitating the implementation and increasing the transferability of water efficiency solutions in tourism.
- Learn the most common achieved benefits generated by the adoption of water efficiency solutions in tourism.
- Learn key actions that increase water efficiency pertaining to the following services:
- Creating a water conservation program addressing the following priorities:
    - Accommodation.
    - Laundry.
    - Kitchen.
    - Swimming pools.
    - Irrigation.
    - Training staff
    - Engaging customers
    - Wellness centre

Module 4

Learning how to design conflict resolution mechanisms

- Understand the need for and meaning of stakeholder engagement and conflict resolution mechanisms.
- Learn the key elements of successful conflict resolution.
- Learn how to achieve the successful participation and engagement of all parties in conflict resolution.
- Learn how to use mutual gains and benefits for all parties as a key component of successful conflict resolution.
- Learn how to apply efficient monitoring techniques to pre-empt and resolve conflicts.
- Learn how to develop mechanisms specialising in conflict resolution.

Module 5

Learning how to develop and implement policies that increase water sustainability in tourism

- Understanding the characteristics and features of current policy making in EU Mediterranean countries aimed at improving water sustainability in tourism businesses
- Finding out the best policy recommendations aimed at improving water sustainability in tourism businesses

Module 6

How to use and analyse the results of the CASTWATER online monitoring tool

- Understand the need to develop an online tool for tourism SMEs' self-assessment of their water efficiency.
- Learn how to use the online tool.
- Learn how to analyse the values of indicators upon which the online tool is based.

3 How to use the CASTWATER toolkit

The CASTWATER self-training toolkit is a multi-faceted tool designed to inform public sector managers and employees about the essential aspects of improving water sustainability among tourism businesses and SMEs. The tool was prepared by the CASTWATER partnership and is designed so as to be easy to use by all types of relevant public sector staff and to deliver all the necessary information to tackle this key issue of tourism development. Delivering a tool that is easy to use was the main reason why the toolkit provides information through the following four types of training resources:

1. Modules (including textual information and infographics where suitable): the modules provide an abundance of information, based on research activities carried out by the CASTWATER partnership.

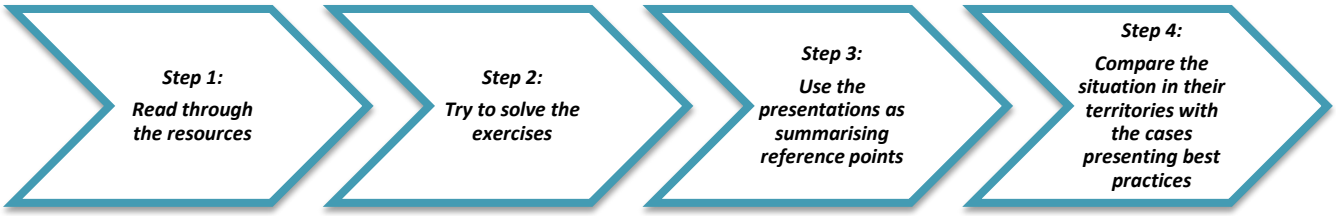
2. Exercises and solutions: the exercises can be used by public organisations' staff as an easy way to find out whether or not they have acquired the necessary knowledge and skills provided by the toolkit.

3. Presentations: the presentations are aimed at summarising the key points of each module and at providing an easy-to-find reference point for public organisations' staff.

4. Case studies (of tourism businesses showcasing best practices for improving water efficiency): the case studies chosen provide examples of the practical application of water sustainability strategies by tourism businesses in the real world.

The above resources are envisaged to cover the full range of self-training needs of public sector managers and employees, from textual information, to summaries, concrete examples and assessment materials. Public organisations' personnel are welcome to utilise them whilst developing relevant policies according to the following steps as per Figure 1 below:

Figure 1: How to utilise the CASTWATER self-training resources



4 Module 1: Learning the characteristics of integrated water resource management (IWRM) in the tourism sector

4.1 Integrated water resource management (IWRM): rationale & definition

Self-learning targets:

1. Understanding the definition and key characteristics of integrated water resource management (IWRM).

2. Understanding the key types of measures tourism stakeholders identify as most effective to achieve IWRM.

Since water scarcity is a major concern for Mediterranean countries, it is expected that their development should be as efficient as possible with regards to the utilisation of water resources, across all industries. Coastal areas, especially in the Mediterranean region, often present significant challenges for water management due to increasing number of tourists and high peak water consumption especially during summer periods. After all, it is a fact that a tourist's water consumption is higher than a resident's water consumption. Based on recent research (Gϕssling et al., 2011; European Environmental Agency, 2009), tourists consume circa twice the water compared to residents' consumption; with a European tourist consuming around 300 litres per day compared to residential water consumption at approximately 150 litres per day. However, it is important to keep in mind the important contribution of the tourism sector to economic growth, foreign exchange, job creation, , domestic capacity-building, poverty reduction and revenue generation, in particular amongst small and medium-sized enterprises (SMEs). CASTWATER remains aware of this fine balance, and is committed to promoting water conservation while remaining cognisant of the important economic contribution of tourism in broader economic and social terms.

There are a number of reasons for higher tourist water consumption in accommodation enterprises, including maintenance of grounds (irrigation), daily room cleaning, daily laundry, maintenance of swimming pools, landscaping irrigation, intensive kitchen activities, and a '*pleasure approach*' to showers and baths (Eurostat, 2009). Furthermore, the effects of tourism on water resources are exacerbated by the fact that water consumption varies significantly across different types of accommodation (hotels of different categories, campsites, holiday lets, bed & breakfast guesthouses, resort hotels etc), seasonal pressures and water-intense tourist activities during the stay (yachting, golf, swimming etc). In addition, the existence of a swimming pool, for example, has been identified as one key differentiating factor of water use in hotels (Tortella and Tirado, 2011). In general, water consumption in tourism can be distinguished in direct and indirect water consumption (Gϕssling, 2015). Direct water consumption takes place within tourist accommodations (ex. when washing or using the toilet or using swimming pools, spas

etc). On the other hand, indirect water consumption takes place in the food preparation sector, transportation (fossil fuel production, biofuel production) and energy consumption at hotels.

The management of water resources in the tourism sector, also known as Integrated Water Resource Management (IWRM) in the EU and Water Demand Management (WDM) in the USA, is intended to result in the best utilisation of available water sources, including the reuse of waste water, across the tourism sector. More precisely, IWRM aims to promote effective water use efficiency and conservation across the tourism sector while advancing both social and economic development, and environmental protection. IWRM, as we will see below, can also be used to promote the development and use of more efficient water use technologies and practices. In the literature, there are various definitions proposed for integrated water resource management:

1. IWRM refers to the implementation of policies or measures which serve to control or influence the amount of water used (UK Water Industry Research Limited, 1996).

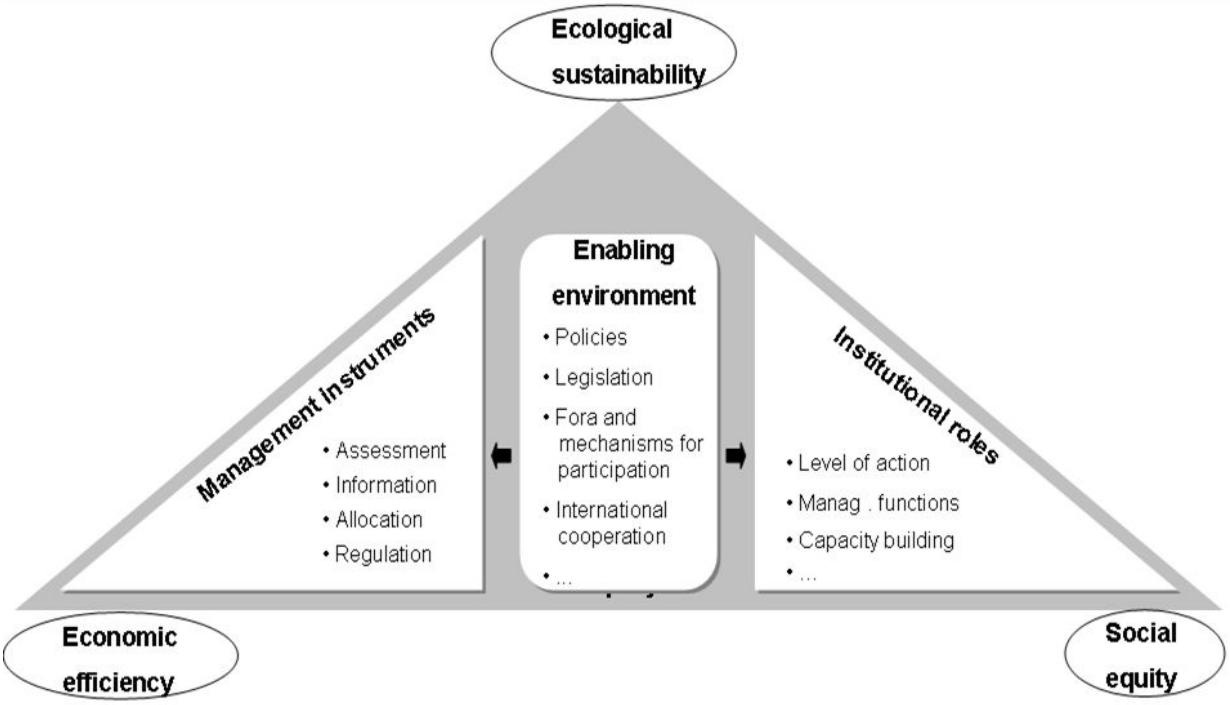
2. IWRM seeks to maximize the usage of a given volume of water by curbing inessential or low use values through price or non-price measures (SADC, 2003).

3. The adaptation and implementation of a strategy by a water institution or consumer to influence the water demand and usage of water to meet any of the following objectives: economic efficiency, social development, social equity, environmental protection, sustainability of water supply and services, and political acceptability (Ministry of Water Affairs and Forestry, South Africa, 2004).

4. Any socially beneficial action that reduces or reschedules average or peak water withdrawals or consumption from either surface or groundwater, consistent with the protection or enhancement of water quality' (Louw and Kassier, 2002).

The definitions above are summarised in the following figure (Mekong River Commission, 2012, p.14):

Figure 2: The IWRM Framework (http://www.waterandmegacities.org)



The figure above suggests that IWRM relies on three distinct principles, i.e. economic efficiency, social equity, and ecological sustainability, with the latter being the epicentre of the whole process. This trichotomy is mirrored by the fact that efficient IWRM depends on forming an enabling environment by developing the necessary policies, legislation, and structures for stakeholder engagement. This factor of primary importance affects and co-forms efficient IWRM combined with two other factors, i.e. the utilisation of specific management instruments by organizations and the formation of the appropriate institutional environment. The following sections move beyond this general picture and address the issue of specific measures for achieving efficient IWRM.

4.2 Integrated water resource management measures

Derived from the aforementioned definitions, the term water demand management measures in this text refer to any activity, law, practice, technological device that can potentially reduce or optimise water use. Integrated water resource management measures are usually grouped, according to the type of incentives/measures applied, in the following categories:

- **Regulations/Legislations**: To enforce laws and regulations currently in use and to continue to update and develop laws and legislations to implement the best practices in water use. The successful application of regulatory/legislative measures is perhaps, the most important responsibility of public authorities.

- **Awareness (education):** To drive people to change their water-use practices, by increasing their knowledge of conversation issues and attempting to influence and change their attitude towards them. Awareness measures are designed and run by water utilities, schools and authorities.

- **Price (economic):** The price of water and the tariffs plans are key elements and essential tools of water demand management, to control and raise the efficiency of water use in all sectors regardless of the water source. Economic measures are typically designed and run by the water authorities.

- **Adoption of technologies and demand programs:** This includes adopting new measures such as monitoring tools with smart meters, installation of low taps and showers, use of alternative water sources, use of leakage detection technologies.

It is easy to provide specific examples of measures pertaining to the aforementioned categories, since there is huge potential for IWRM measures and reductions of water use within accommodation establishments and tourist's facilities. More precisely, depending on their water efficiency, hotels can reduce the amount of water consumed per guest per night by up to 50%. Examples of such measures include the following:

- A large portion of potential savings (up to 20%) can be achieved through relatively simple and inexpensive installation of efficient water fittings which have a relatively high frequency of replacement (European Commission, 2009).
- Dual water systems and the reuse of treated wastewater supplied from a hotel's own treatment plants can save about 35% (Kotios et al., 2009).
- It is estimated (European Commission, 2009) that water recycling can reduce water consumption by an additional 10 %, after a 40% reduction in water consumption achievable from implementation of water efficiency measures.
- Providing environmental information and raising awareness among tourists of the environmental consequences of their actions related to water consumption.
- Setting up systems which economise on water flow modulators (pressure relief valves on the network inside the home, small water cisterns for flushing toilets, flow-reducing aerators for taps and shower heads), and electrical appliances which use less water.
- These systems can save water since it is possible to reduce consumption by 40% without inconveniencing the user (Global Water Partnership, 2012).

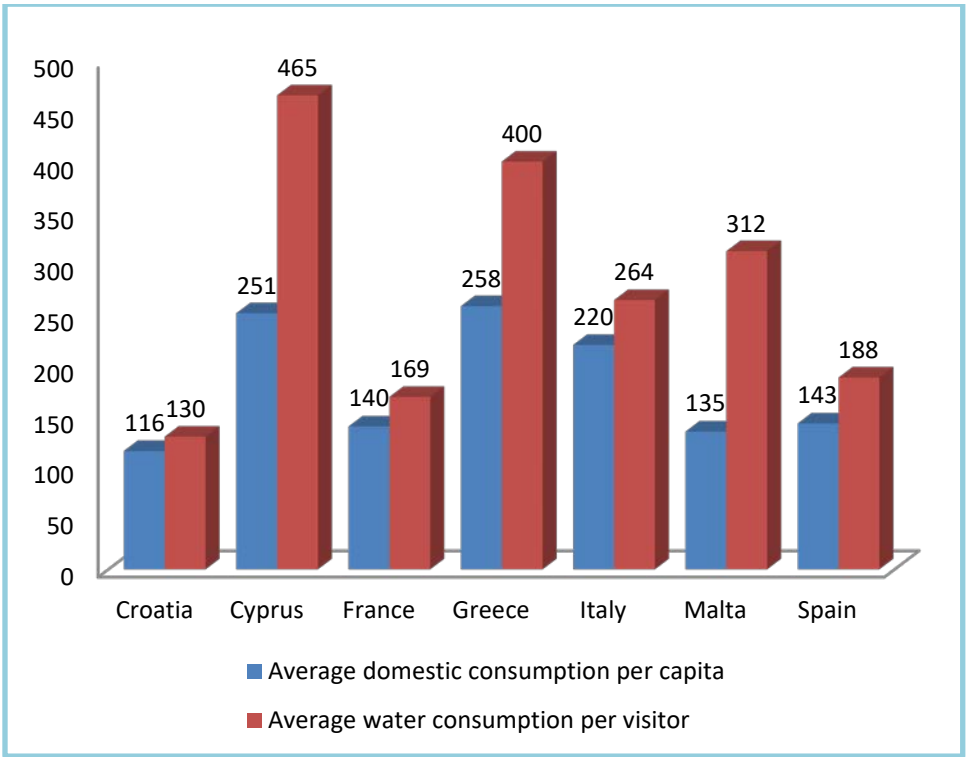
4.3 Perceptions of integrated water resource management needs among tourism stakeholders

Both actual statistical data related to water consumption in tourism and the responses of tourism businesspeople provided within the context of CASTWATER studying activities revealed that the

Mediterranean tourism sector could ameliorate its integrated water resource management to improve upon its sustainability. More precisely, the juxtaposition of desk research and survey results conducted in CASTWATER activities with regards to this issue, revealed specific information about water efficiency in the Mediterranean tourism sector and indicated specific areas where public sector employees could make a difference and take measures that increase water efficiency in the tourism sector.

Based on the available data, in most Mediterranean territories, the tourism industry water consumption is between 2-8% with respect to the total water consumption. In general, average water consumption per tourist is significantly larger than domestic water consumption. The following figure provides some indicative examples of the large discrepancy in average water consumption per day (litres per capita per day) between tourists and residents in Mediterranean territories.

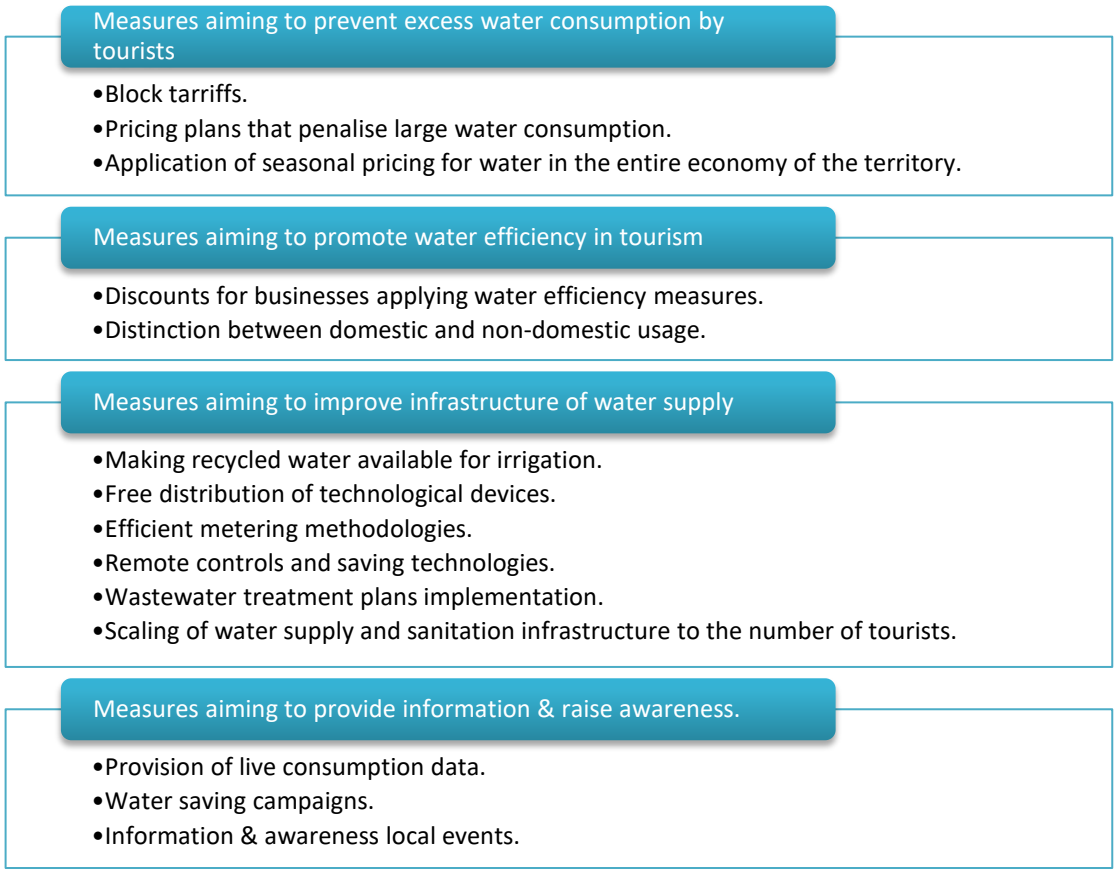
Figure 3: Comparison of average tourist vs average resident water consumption



Source: Eurostat (2015), CASTWATER partners' input & Becken (2014), & Istat (2017)

To reduce the excesses in water consumption by tourists described in the figure above, Mediterranean territories have resorted to the types of measures outlined in the following figure:

Figure 4: Types of measures aiming to reduce water consumption by tourists



To elaborate upon the figure above, representatives of tourism businesses typically acknowledge that solutions lie with providing financial measures supporting and promoting water efficiency. Such fiscal measures could include promoting various types of tariffs and pricing schemes which either penalise excesses in water consumption by tourists, or by incentivising measures which reduce water consumption and promote water efficiency. More precisely, many Mediterranean territories use water tariffs to support integrated water resource management, but other measures such as discounts for businesses applying water efficiency measures and the application of seasonal pricing in the entire economy of the territory are also used. There also limited cases where governments offer benefits to the tourism sector to motivate them to be water sustainable. In France, for instance, the construction of buildings takes advantage of labeling schemes. These labels set building construction requirements or standards according to different targets, including the rational management of water. In return for its "environmental" efforts, the building is provided with financial aid or a tax reduction. Furthermore, another noted vehicle to fund efficient water management is also through European projects and part-subsidised loans that support the tourism sector in saving water and energy.

When referring however to financing efficient integrated water resource management, it is important to take into account the potential motivation of tourism businesses to implement the necessary measures to improve it. CASTWATER's first research results reveal that the main motivation behind the decision of hoteliers and the wider accommodation sector to introduce sustainable integrated water resource management measures does not necessarily lie with the benefits of reducing consumption, but mostly the achievement of a green image and improved sustainable marketing. However, this does not exclude that the sector is indifferent to the provision of public funds which can help implement integrated water resource management measures like more efficient metering technologies and remote controls. The same applies to the food and drinks sector, with the important difference that they seem less motivated to reduce water consumption compared to the accommodation sector due to the relatively lower water use.

Another way to promote efficient integrated water resource management, is the diffusion of information which usually takes the form of running awareness campaigns to inform people about water saving and efficiency. School students are most common target category for awareness campaigns. A distinct way of diffusing information is providing live consumption data to businesses so that they can orientate their water efficiency measures correctly. However, an important form of transferring knowledge and information is missing: employees working in the tourism sector are not trained enough to optimise the water consumption.

Moreover, it is noted that there is an absence of strong local regulations to support water efficiency especially in the tourism sector. However, there are some cases (e.g. Murcia) where concrete measures that go beyond recommendations or a simple code of good practices have been implemented and are obligatory rules in all types of establishments open to the public, including all tourist establishments.

4.4 Key policy interventions to improve integrated water resource management

Based on the analysis so far in this chapter, we can conclude that there is a need for policy and administrative change with regards to the following:

1. Formation and efficient implementation of innovative pricing schemes that account for the fact that the economic cost of water for the majority of the touristic enterprises is not a primary motive behind improving their water efficiency. Innovative pricing schemes and tariffs should consider the need of touristic enterprises to achieve water efficiency as a means for developing a green image and increasing the demand for their services.

2. Linked with the previous argument, is the fact that the majority of tourism enterprises express their high interest to invest in achieving a sustainability certificate or getting a good grade in an innovative EU labeling system as soon as this is developed by the EU. Sustainability certificates and labeling systems are an excellent way to achieve the green image signaling effect. Hence, public administrations should make reliable sustainability certificates available for each type of touristic

enterprise. Otherwise, it would be advised that MED territories develop a labeling system for water efficiency in tourism analogous to the one used in the EU to rank energy efficiency (European Parliament and Council, 2010).

3. Tourism businesses and especially SMEs are in need of financial support in order to adopt technologies improving water efficiency in tourism. The cost of installation and maintenance of integrated water resource management devices (smart meter, leakage detection systems, intelligent monitor and controlling systems) is high and not financial viable (due to the low cost of water). Hence, there is a need for specialized co-funding by the water providers or the government. Of course public authorities should always take into consideration State Aid Regulations when financially supporting SMEs and the pay back periods of water saving technologies.

4. There is a need for advanced training courses and workshops by the tourism sector in order to train the employees to apply efficient integrated water resource management measures and technologies.

5. With the exception of cases where relevant policy has already been developed (e.g. Murcia), Mediterranean regions need to develop and implement specific policies and regulations to help water efficiency in the touristic sector.

6. As an additional comment, the previous arguments lead to the conclusion that tourism establishments need to capitalise more upon alternative in-house water sources, and public authorities should do more to support them in their efforts to use such sources. This could be achieved by co-financing or tax releases or any other financial incentive. Alternative in-house water sources can significantly improve the green image of tourism businesses and, at the same time, reduce the cost of water.

4.5 Key learning points of Module 1

- Water scarcity is a major concern for the countries of the Mediterranean.
- The term integrated water resource management measures refers to any activity, law, practice, and/or technological device that can potentially reduce or optimize water use.
- Integrated water resource management measures include:
    - Regulations/Legislations.
    - Awareness (education).
    - Pricing approaches (economic) where necessary.
    - Adoption of technologies and demand programs.
- There is a need for policy and administrative change with regards to the following:
    - Formation and efficient implementation of innovative pricing schemes.

- Public administrations should either make reliable sustainability certificates available for each type of touristic enterprise or apply EU labeling systems for water efficiency as soon as these are developed.
- Tourism businesses and especially SMEs are in need of financial support in order to adopt technologies with long pay-back periods that improve water efficiency in tourism.
- There is a need for advanced training courses and workshops and periodic training procedures to be developed by the tourism sector in order to train the employees to apply efficient integrated water resource management measures and technologies.
- Mediterranean regions need to develop and implement specific policies and regulations to help water efficiency in the touristic sector.
- Tourism establishments need to capitalise more upon alternative in-house water sources, and public authorities should do more to support them in their efforts to use such sources.

5 Module 2: SWOT analysis of the process of adopting water efficiency and management solutions by the tourism sector

Self-learning targets:

1. **Understanding the need for a SWOT analysis of PESTEL factors impacting water sustainability in tourism businesses and SMEs within each territory.**
2. **Understanding the outline of the impact of each category of PESTEL factors in the Mediterranean**

After presenting the measures identified by tourism businesses as necessary for the further diffusion of efficient integrated water resource management and the achievement of water efficiency in the tourism sector, it is necessary to understand the strengths, weaknesses, opportunities and threats that characterise this process, and have to be taken into account by public authorities. The informations in this chapter are the result of a CASTWATER survey among three main types of actors within each territory: regional authorities representatives (state services), socio-professional representatives of the tourism sector, and representatives of local authorities (communities). Additional respondents from the research sphere for example were also included when possible.

The information received from the survey is categorised using the PESTEL method which outlines the strengths, weaknesses, opportunities and threats to the expansion of water efficiency in the tourism sector pertaining to Political, Economic, Socio-cultural, Technological, Environmental, and Legal contexts. The following figure from the CASTWATER deliverable D3.4.1: 'SWOT and impact analysis on the adoption of water efficiency and management solutions by the tourism sector' (p. 70) summarises these factors for the political (P), Economic (E), Socio-cultural (S), Technological (T) and Legal (L) contexts:

Figure 5: SWOT and PESTEL analysis of the adoption of water efficiency measures of the tourism sector

STRENGTHS = build on…	WEAKNESS = correct or eliminate…
P Water efficiency oriented local policies **Ec** - Incitative water prices and special pricing (progressive, seasonal) - Growing trends in the number of tourists **S** - Good knowledge about the resource and existing solutions - Awareness (of policy makers, tourism staff, tourists) - Traditional value of scarce water - Water sharing culture **T** - Good condition of water infrastructures - Good availability of technology to measure water and to reduce water consumption - Availability of water recycling technologies	**Ec** Low water price (low incentives) - Growing trends in tourism standards (more water intensive) **S** Cultural perception of water resources as unlimited - Cultural reluctance to water reuse - Little interest to promote sustainable tourism image of the territory **T** - Aging and leaking water infrastructures (necessary renewal) - Poorly developed technology to recover rainwater - Slow development of technology for water reuse - Available supply of alternative water resources as a demotivator for efficiency
OPPORTUNITIES = exploit…	**THREATS = mitigate…**
P Existing sustainable development policies at national level - Existing international sustainable tourism development policies Adoption of internal policies of tourism operators, certification programs - Effective framework for water governance, with participation of water users and integrated planning **Ec** Reasonable return on investment for water saving devices **En** Scarce water resources in an increasingly vulnerable region to climate change consequences (trends and extreme events) Vulnerable ecosystems highly dependent on water flows Most water stressed season is the most intensive for tourism	**Ec** Competition with touristic destinations with more water supply **L** -Lack of coordination between urban planning and water use planning - Possible legal barriers to water reuse - Weak enforcement of regulations

5.1 The political context

The SWOT/PESTEL exercise in Figure 5 above suggests that the current policies are strengthening the implementation of water efficiency measures in tourism and, at the very least, their exploitation can be considered a great opportunity for the diffusion of such measures. Policies aiming to increase the sustainability of the tourism sector can be considered a strength or an opportunity for a number of reasons, such as the following:

- European Union countries as well as the EU as a whole have already implemented policies aiming to increase sustainability and specifically water efficiency. Public sector administrators and employees should consider the advice of such policies, such as the Mediterranean Strategy for Sustainable Development (MSSD), and the EU Water Framework Directive. The latter for example, includes water-pricing policies aiming to provide adequate incentives for users to use water resources efficiently. In some other cases (France, Spain), there are already policies providing incentives for implementing water efficiency measures such as the river management plans,

taxation and efficiency objectives, and water departition zones in water scarce areas with special abstraction rules.

- Increasing attention is given to sustainable tourism strategies and policies, including resource efficiency policies and, hence, water efficiency. Examples include the United Nations Environment Programme that identified 12 aims for sustainable tourism, Murcia's Strategic Plan for Tourism 2015-2019, in which the sustainability of resources is foreseen as a key indicator of smart and quality tourism. Other cases of similar tourism policies include a labeling programme for sustainable tourism practices in France and the Croatian National Tourism Development Strategy till 2020. Capitalising upon sustainable tourism strategies and policies presents a huge opportunity for improving integrated water resource management in tourism, since there is great space for improvement in the speed of their application s at a national level.

- Public administrators can increase the efficiency of water governance in the tourism sector by applying the new EU Water Framework Directive (2016), which sets the river basin level as the best management level and involves water users in the management processes so as to balance all needs and make it more enforceable, as can be seen below (European Commission, 2016):

> "The best model for a single system of water management is management by river basin - the natural geographical and hydrological unit - instead of according to administrative or political boundaries... While several Member States already take a river basin approach, this is at present not the case everywhere. For each river basin district - some of which will traverse national frontiers - a "river basin management plan" will need to be established and updated every six years, and this will provide the context for the co-ordination requirements identified above."

The Directive also requests that water prices are adequate to reflect true costs and provide incentives for a sustainable use. Applying the Directive on the territories can therefore provide a real opportunity to organize the dialogue between water users, set local priorities and promote water efficiency measures. Beyond the directive, public administrators can improve the supply of water by following the advice of OECD with regards to the formation of relevant public-private partnerships (OECD, 2009). The application of such partnerships in the water supply sector needs to be careful however since the respondents mentioned that they trust more the public sector to set water efficiency policies with success.

- Another strength of applying water efficiency measures in tourism is the fact that there are current cases of successful local policies that address this issue. For example, in France, local initiatives are often initiated through calls for projects on various themes by public institutions and are further used as pilot cases. Typically these may range from awareness raising campaigns, to seasonal use

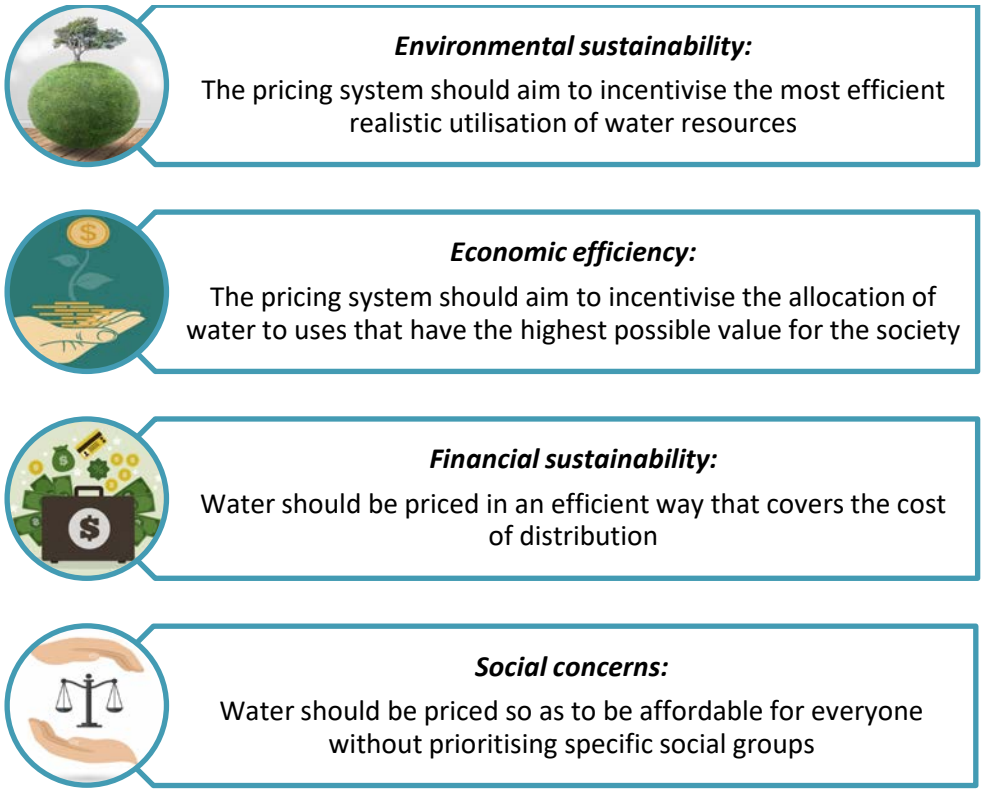
restrictions, progressive pricing, or specific urban development and management solutions. It also concerns crisis management in a drought context. Another such example is Istria where the local administration started a new project for sustainable development targeted at SMEs of the tourism sector, where water savings are specifically encouraged.

5.2 The economic context

Continuing the application of the PESTEL method and moving on from the policies applied to achieve efficient integrated water resource management, it is necessary to understand the economic aspects of the adoption of water efficiency measures. The responses in the survey reveal that there are economic factors that can be categorised in all categories of a SWOT analysis.

The greatest strength of the economic dimension of the adoption of water efficiency measures by tourism businesses has to do with the fact that there are already in place pricing schemes that promote this process. In many countries the prices of water are very high and there are in place pricing schemes that aim to reduce excesses in water consumption during the touristic season months. In general, public administrators need to capitalise on this experience, by developing pricing schemes for water that aim to achieve the targets outlined in the figure below (OECD, 2010):

Figure 6: Objectives of water pricing schemes promoting efficient utilisation of water in tourism



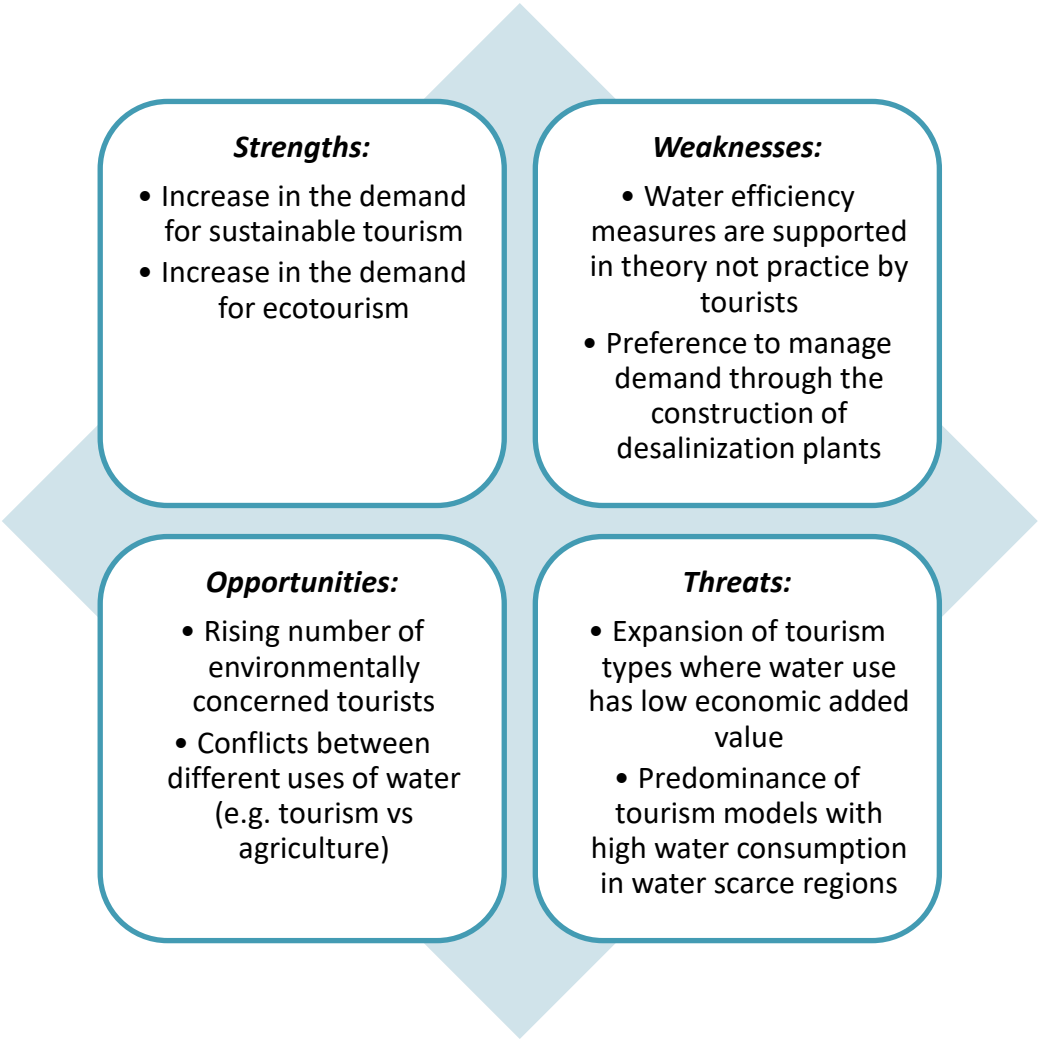
Beyond the discussion of price incentives discussed above, public administrators have the opportunity to apply the following measures to achieve the objectives of Figure 4:

- Apply a special seasonal price for water during tourism high season to encourage water efficiency. This is crucial as most Mediterranean regions face touristic peaks especially during the driest and hottest Mediterranean seasons when water is scarce but mostly appreciated.
- Apply progressive increasing pricing systems beyond a certain volume of consumption (increasing block tariffs).
- Use restrictions and cuts in water supply in case of excessive consumption.

Pricing levels and schemes are important determining factors of the further adoption of water saving technologies. In general, the technological infrastructure of water supply & management systems for the tourism sector can be considered a weakness for the process of adoption of water efficiency measures in tourism and this was partially due, historically, to the maintenance of water pricing schemes that did not took into account the excesses of tourism water demand. Pricing schemes that do take into account tourism effects, by e.g. providing reductions in the price of water in case of adoption of water saving technologies such as the ones described previously, can function as an incentive for the adoption of technologies such as watersaving devices, greywater re-use and rainwater harvesting, and leakage reduction in distribution and supply networks. As soon as the price is adjusted enough then the favorable return upon investment is the greatest opportunity for applying the measures. After all, flow limiters on taps and showers, or lavatory cisterns with reduced flush options have payback times between 0,1 and 9, 6 years (Gossling et al. 2012).

To complete the presentation of the economic dimension of the adoption of water efficiency measures in the tourism sector public administrators should take into acount some quantitative and qualitative characteristics of the tourism industry in the Mediiterranean. First of all, the growing number of international tourists in the Mediterranean renders imperative the further adoption of efficient water management measures in tourism. It is expected that the number of international tourist arrivals in these countries will have more than doubled between 2000 and 2020 (Gossling et al, 2012). This can be considered a great opportunity for public administrators that want to promote the agenda of water efficiency in the tourism sector, even though the observed low awareness of tourists with regards to water saving measures can be considered one important weakness of such strategies. Furthermore, the qualitative characteristics and trends can be categorized in the following way, depending on whether they are strengths, weaknesses, opportunities and threats:

Figure 7: SWOT analysis of the economic side of water efficiency measures in tourism

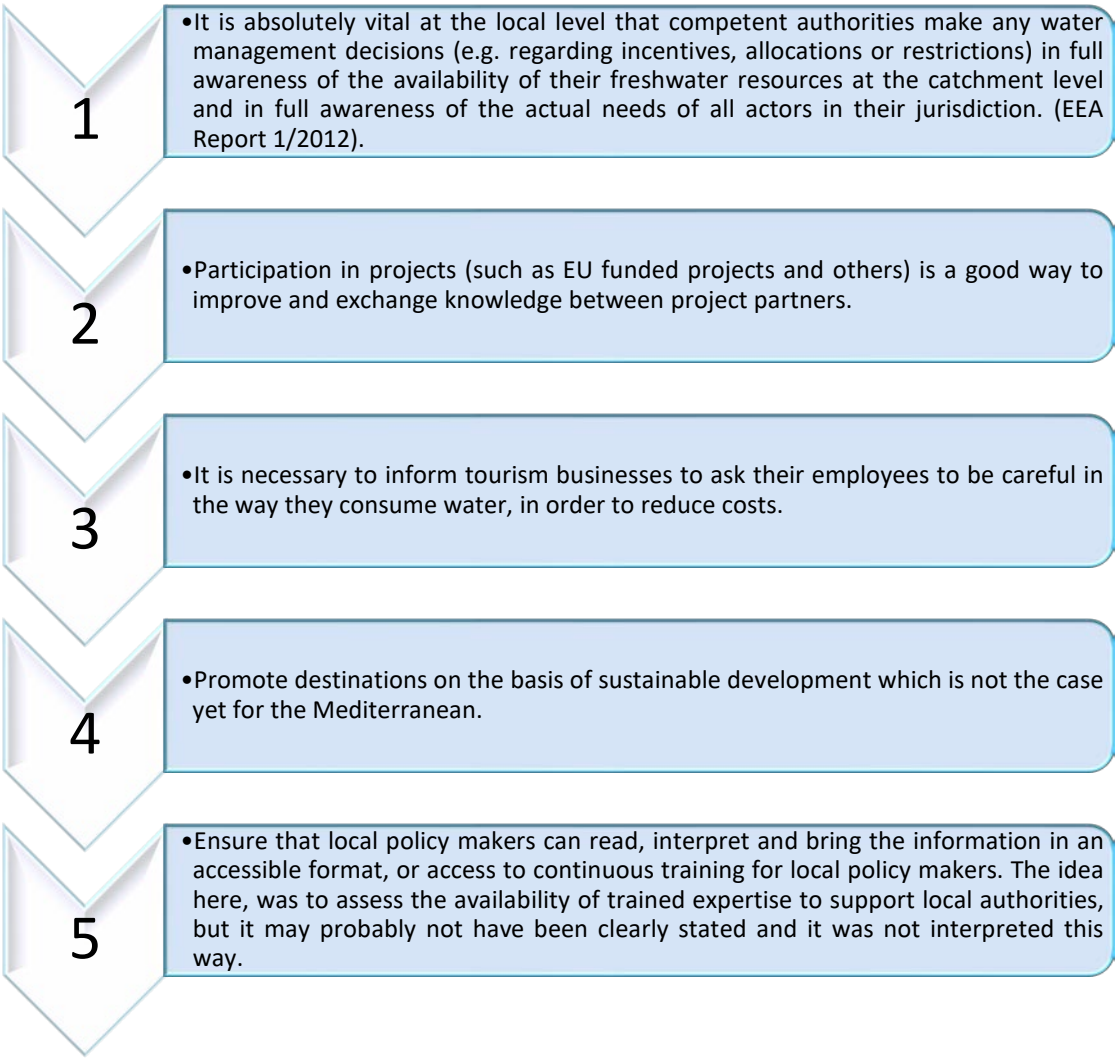


5.3 The socio-cultural context

After the policies that are applied and the characteristics of the economy of adopting water efficiency measures in the tourism sector, it is necessary to evaluate the socio-cultural aspects of this process. Figure 3 reveals that socio-cultural factors can be described as either strengths or weaknesses of this process.

The most important socio-cultural factor that fosters the adoption of water efficiency measures in the tourism sector is the increased level of awareness about water efficiency among all stakeholders of the tourism sector and tourists. Nevertheless, there is still progress that can be made in this field. More precisely, public administrators should take the following measures to increase awareness and render it more effective:

Figure 8: Necessary actions to increase awareness for the adoption of water efficiency measures in tourism



Beyond the increased level of awareness, cultural factors should be considered mostly a weakness of the process of adopting water efficiency measures. The predominant model in Mediterranean tourism is the 3S (Sea, Sun and Sand) model which is usually (but not solely) oriented toward mass tourism. The latter does not attract the most environmentally concerned tourists; and observed current trends towards more water intensive leisure activities being developed even in territories with scarce water resources, is a reflection of this demand.

Furthermore, as noted by Laureano et al. (2008), the Mediterranean climate is notorious for the observed irregularities in the distribution of rainfall in space and time. Older generations were more sensible to these irregularities and the possibility of water scarcity in the region because the access to water was very painful. Nowadays, however, access is easy and, despite the fact that water scarcity has not become less

frequent, the opposite perception has been formed, i.e. that water is a cheap commodity and abundant resource. This mentality which prefers to ignore the issue of water sustainability, also affects the issue of water reuse and recovery. Though a lot of effort (technological and economic) are still needed for the treatment of waste water, plus substantial behavioural changes and habits/misunderstandings towards water reuse need to also be overcome, especially in the agricultural sector, where there is resistance by consumers to purchase products produced by treated sewage effluent.

Certainly, Mediterranean territories are not a homogeneous field with respect to these issues. Greece for example is very attached to traditional low price structures for water and its public management, while still apportioning value of this scarce resource. Malta used to have a very high awareness of water scarcity, which seems to decrease due to technological solutions for water supply (a National Water Conservation Campaign is about to be launched to tackle this issue). In Murcia, tourism stakeholders consider water a valuable and scarce resource that must be managed with great efficiency. In France, there is some improvement in the considerations given to water resources that were perceived as unlimited. However, public administrators in all these areas should try to take actions to reduce the effect of these factors.

5.4 The technological context

When trying to foster the adoption of water efficiency measures in the tourism sector, public administrators should have a very good knowledge of the technological infrastructure of their territory with regards to water supply, distribution and consumption, its quality, and any opportunities to upgrade it by applying technological innovations. On the one hand, the responses in the CASTWATER survey revealed that, in general, the technological infrastructure of water supply and distribution in the tourism sector should be considered a strength of Mediterranean territories. Water supply networks in good conditions (with relatively small losses of water) are important for the promotion of water efficiency measures, as it may be difficult to advocate for them when the public network is inefficient. On the other hand, improvements can definitely be made and public administrators should actively implement solutions. For example, in Greece (including Crete) though some favorable assessments were made, most of comments acknowledged an old supply infrastructure that needed replacement, and even if a storm-water collection exists, it goes directly to the sea without possible reuse.

To upgrade the technological infrastructure of water efficiency, Mediterranean territories should further integrate the following technological innovations, after considering their economic effectiveness:

1. Technologies to improve measuring water consumption: Measuring water consumption is a first essential step in order to have knowledge and awareness on the level of consumption and to monitor any progress on water efficiency. Examples of such technological innovations include water metering instruments, such as the telematic control of consumption.

2. Technologies reducing water consumption: There is a big diversity of technologies widely available that help reducing water consumption such as e.g. flow restrictors, dual flush toilets, or movement sensors in water taps.
3. Technologies promoting rainwater recovery: Rainwater harvesting consists of the collection and storage of rainwater for a future use. The systems range from rather simple domestic models to sophisticated public collecting networks for storm waters. From there, rainwater can be used for the gardens, washing the cars, or sometimes for domestic use such as toilet flushing. Results from respondents show that these technologies are not common in the region for all territories. Murcia considers that rainfall is too low to make the technology attractive. In Greece a very small proportion of tourism business have implemented rainwater harvesting. In Hérault also the technology is not felt as adapted for the conditions of the territory and there is also a lack expertise. No one mentioned the reuse of urban storm water, which is therefore assumed as not being commonly implemented.

Water reuse technologies: Wastewater reuse has developed from simple collection and disposal of waste water without any treatment to very sophisticated engineering solutions for the treatment of wastewater for their further use in agriculture, industry or even for drinking purposes depending on the level of the quality requirements. Reuse of water (e.g. from waste water treatment or industrial installations) is considered to have a lower environmental impact than other alternative water supplies (e.g. water transfers or desalination), but it is only used to a limited extent in the EU. Technically feasible water reuse projects often do not get implemented due to institutional, economic, and organisational barriers, or poor public perception and education. These non-technical barriers are a limitation to the expansion of water reuse planning. (Alcade et al, 2014) to this aim, public administrators should follow the relevant EU water reuse guidelines that were published in June 2016.In our survey, though many respondents put a favorable response to the assessment of this factor, only Murcia Region indicated that the technological offer for water reuse is very important for them: the Region of Murcia has a sewage and water treatment system composed of more than 90 facilities that serve almost 100% of the population. The reclaimed water is almost 10% of the regional water budget. These sewage and water treatment system facilities are equipped with a tertiary treatment system and produce a pre-potable water capable of being used for ecological flow, irrigation, and other tourist uses such as water parks. It is a strength of the Murcia region for water efficiency.

5.5 The environmental context

The environmental factors affecting the process of adopting water efficiency measures can be considered an opportunity for strengthening this process, to the extent that they render it indispensable. The Mediterranean climate, also called the Dry Summer Subtropical climate, is characterized by a dry and hot weather during the summer months. This dry period is also the time of the year when most tourists arrive, especially those following the mass tourism model. Their arrival increases the existing stress on water resources. High temperatures increase evaporation, increase water demand for agricultural needs as well

as tourists demand for water related leisure. The seasonal concentration of rainfall and the threat of water scarcity in the area this causes, combined with the increased tourism flows during the dry season, means that there is an increasing challenge put on fresh water resources that can become an opportunity for water efficiency development.

Beyond the climate, the environmental factors in the following figure also function as incentives for the proliferation of water efficiency measures:

Figure 9: Environmental factors incentivising water efficiency

Mediterranean variable landscape

- Tourism territories in the Mediterranean have variable landscape, with wetlands and transitional waters, plains and mountains each with its specificities and vulnerabilities. Transitional waters in particular are vulnerable but valuable ecosystems with an important ecological and economical role that need to be preserved. This vulnerability and necessity to preserve could be seen as an additional incentive to have more efficient water use as intensive water use in a context of water rarefaction will increase the risk of salt water intrusion to these ecosystems with the loss of their economic and environmental value

Spatial concentration of tourism

- Mediterranean tourism is mostly concentrated on the coastal line, and is confined to urban areas where the highest water demand occurs. Low density ecotourism with lower water demand is less developed. Istria for example indicated that at high season only 5 % of its total tourism occurs inland.

Climate change consequences

- As a "hot spot" of climate change, the Mediterranean will be, in the twenty first century, the site of particularly marked changes in terms of rises in temperature and decreases in average rainfall, inter-annual variability and extreme meteorological events. The climate models reveal temperature rises likely to range between 2.2 and 5.1°C for the time frame 2100 and a decrease in average rainfall in the range of 4 to 27%, with a particularly marked decline in the summer. These evolutions are likely to induce a decrease in the available water resources on the three rims of the Mediterranean basin, together with a rise in water demand, especially in the agricultural sector (UNEP Blue Plan, 2008). If heat-waves and summer temperatures increase, the Mediterranean regions could become less attractive to the benefit of more northern destinations. (UNEP MAP Plan Bleu 2009)

Vulnerability to extreme events

- As just indicated above, climate change will increase the number of extreme climatic events such as heat waves, storms or forest fires. In order to decrease their vulnerability to those events, the territories need to get prepared for emergency responses in particular in the water supply sector with more water storing capacities. (Water Environmental Research Foundation 2014).

5.6 The legislative context

Moving on to the final part of the SWOT analysis of PESTEL factors affecting water efficiency in tourism, it is necessary to develop an understanding of the legal factors affecting the implementation of measures that will increase the sustainability of water in tourism. The results of the CASTWATER survey show that legislation capable of regulating and promoting such measures has not been developed in the Mediterranean regions to the extent that is necessary. More precisely:

- There is not always adequate coordination and preparation to update River Basin Management Plans and there are not always specific criteria and provisions in place for land uses that can strengthen water sustainability.

- Despite the water reuse applications already developed in many countries, a number of barriers still prevent the widespread implementation of water reuse throughout Europe and on a global scale. Among the barriers identified, the first on relates to inconsistent or inadequate water reuse regulations/guidelines, which lead to delays and misjudgments. The convergence of water reuse regulations is a very important challenge for the worldwide development of water reuse and its integration into urban water management. New regulations should be based on health and environmental protection, and should include treatment goals and adequate and affordable water quality monitoring. Costly monitoring of compliance, such as that required by several recent regulations, could be an impediment to water reuse development (Alcade et al, 2014). In Europe, there are no guidelines or regulations at the European Union (EU) level. However, several environmental Directives must be taken into account when developing legislation to govern future water reuse at the EU level. Among these Directives, Article 12 of the Urban Wastewater Treatment Directive (91/271/EEC) objective of the protection of the environment from the adverse effects of wastewater discharge. Cyprus, France, Greece, Italy and Spain have developed the most comprehensive standards included as regulations in the national legislation (Alcade et al, 2014).

- Groundwater European legislation is integrated In the Water Framework Directive with a new daughter Groundwater Directive issued in 2008 aiming to a good quantitative et chemical status of these resources by 2015 as it has become increasingly obvious that groundwater should not only be viewed as a water supply reservoir, but should also be protected for its environmental value. The respondents mentioned several times in previous comments that users tend to drill and use ground water resources as a cheaper access to water than through a connection to the water supply network. In such cases, until there is a better control there will be no incentives for these users to invest in water efficiency measures. Though respondents acknowledged the importance of such regulations for water efficiency measures, the situation in each country is difficult to assess through the replies. In some cases, aquifers are already classified as over exploited and cannot be used as

an alternative resource. The most recurrent comment however touched upon the difficulty to control the use of groundwater (illegal use) and enforce regulations.

- Most respondents agreed that the control of the enforcement of the regulations is an important and favourable factor for the development of water efficiency. However several respondents acknowledged that this control is not sufficient or difficult to achieve, and this situation is a threat for water efficiency measures.

5.7 Key learning points of Module 2

- Political factors in general benefit the process of adopting water efficiency solutions in tourism because:
- Public sector administrators and employees can take advice from already implemented EU policies aiming to increase sustainability and specifically water efficiency.
- In some other cases (France, Spain), there are already policies providing incentives for implementing water efficiency measures.
- Economic factors strengthening the process of adopting water efficiency solutions in tourism include:
    - Increase in the demand for sustainable tourism
    - Increase in the demand for ecotourism
- Economic factors weakening the process of adopting water efficiency solutions in tourism include:
    - Water efficiency measures are supported in theory not practice by tourists
    - Preference to manage demand through the construction of desalinization plants
- Economic factors that can be seen as an opportunity for the process of adopting water efficiency solutions in tourism include:
    - Rising number of environmentally concerned tourists
    - Conflicts between different uses of water (e.g. tourism vs. agriculture)
- Economic factors that can be seen as a threat for the process of adopting water efficiency solutions in tourism include:
    - Rising luxury standards
    - Predominance of tourism models with high water consumption in water scarce regions
- Socio-cultural factors should be considered mostly a weakness of the process of adopting water efficiency measures.
- The predominant model in Mediterranean tourism is the 3S (Sea, Sun and Sand) model which is usually (but not solely) oriented toward mass tourism (Global Water Partnership, 2012) and does not attract the most environmentally concerned tourists.
- Observed current trends point towards more water intensive leisure activities being developed even in territories with scarce water resources.
- Hence, it is necessary to increase the awareness in tourism about the need for water sustainability.

- The following environmental factors function as incentives for the proliferation of water efficiency measures:
  - Mediterranean variable landscape
  - Spatial concentration of tourism
  - Climate change consequences
  - Vulnerability to extreme events

The results of the CASTWATER survey show that legislation capable of regulating and promoting such measures has not been developed in the Mediterranean regions to the extent that is necessary.

6 Module 3: Learning best practices for the adoption of sustainable tourism water management solutions by SMEs

Following Gossling et al. (2012), water consumption can be managed by a) increasing the availability of water through water recycling/reuse infrastructures, and b) adjusting water demand and reducing water consumption.

Self-learning targets:

1. ***Learning the key best practices for increasing the availability of water and adjusting water demand to ameliorate water sustainability in tourism businesses and SMEs within each territory.***
2. ***Finding out the key actions to increase the sustainability of water in tourism businesses and SMEs for each key type of activity.***

To describe a strategy aiming to increase the availability of water, water recycling constitutes an excellent way to conserve water in an accessible, smart and effective manner, providing tourism establishments with additional water resources in situations where it's difficult to cover the growing demand for water through public utilities. Recycling refers to the process of removing the solids and impurities from wastewater and rainwater to make it reusable for beneficial purposes such as landscape irrigation, toilet flushing, washing clothes and industrial processes. The following figure describes the most common strategies used to increase the availability of water:

Figure 10: Strategies increasing the availability of water to improve water sustainability

Greywater reuse

- Greywater refers to untreated household/business wastewater that has not come into contact with sewage (or "black water") and can be reused for purposes that do not require potable water such as landscaping, agriculture, or for flushing toilets. Greywater reuse systems range from simple low-cost devices that divert greywater to direct reuse, such as in toilets or outdoor landscaping, to complex treatment processes incorporating sedimentation tanks, bioreactors, filters, pumps, and disinfection, and can enable up to 50 per cent of wastewater to be returned to the property after treatment for toilet flushing.

Rainwater harvesting

- Several tourism establishments (e.g. hotels, restaurants) have large roofs that can be used to gather fresh rainwater, as well as additional impervious surfaces such as parking lots and sports facilities, which can be utilised to capture storm water on site. Rainwater harvesting refers to the collection and storing of rainwater from rooftops and surfaces into natural reservoirs or tanks, with the aim to be reused for gardens, livestock, irrigation, indoor heating and domestic use with proper treatment.

To describe a strategy that adjusts water demand and reduces water consumption, all tourist facilities can save substantial amounts of water by adopting measures that can influence water demand. E.g., replacing an 18 litres per flush toilet with an ultra-low volume 6 litres flush model represents a 70% savings in water flushed, whilst reducing indoor water use by about 30%[1]. The following figure summarises the most common strategies of this type:

[1] http://eartheasy.com/live_water_saving.htm

Figure 11: Strategies adjusting water demand and reducing water consumption to improve water sustainability

Creating a water management plan

- A water management plan provides clear information/data about how a tourism establishment uses water resources. Water management plans can provide information about the areas for targeted interventions / improvements to increase water efficiency, and substantially facilitate the implementation of water efficiency measures.

Using water efficient fixtures

- A number of affordable and easy-to-use water saving devices can improve tourism facilities' water efficiency in a passive way (without requiring behavioural change. Examples include low-flow toilets (6 litres per flush), low-flow showerheads, and water efficient irrigation technologies that use smart control systems and environmental sensors (e.g. rain sensors, soil moisture sensors, and "smart" irrigation controllers).

Regular maintenance of water infrastructures

- Dismantled or aging water infrastructures are responsible for losses, leakages and wastage, which account for 40% of the total water demand in the Mediterranean (Ferragina, 2010). Proper inspection and maintenance of plumbing fixtures and appliances through regular maintenance programmes can help minimise malfunctions and leaks.

Educational programmes for staff

- Training staff on how to make prudent use of water and how to maintain equipment for optimum energy-efficiency is highly recommended in order to mobilise personnel to adopt sustainable water consumption patterns and to adhere to business water management programme for reducing waste of resources.

Raising customers' awareness

- Raising customers' awareness about water issues and businesses' commitment to promote sustainable management will help to make the use of water resources more prudent, preventing wasteful practices (e.g. long-time showers, letting the tap run when brushing teeth).

All the aforementioned best practices have been utilised by touristic businesses and SMEs in the European Union. This section presents the main findings drawn from research conducted within the premises of the

CASTWATER project, the goal of which was to identify common issues and conclusions related to the successful adoption and implementation of water efficiency measures in tourism SMEs. In total, 25 cases were collected and described by project partners through the online form or as a PDF or Word file. The results were deemed representative in terms of geographical distribution and type of establishment and the cases coillected consisted mostly of hotels (72%), and, to a lesser degree camping sites, restaurants, bars and pubs. The reason of the overrepresentation of hotels was that environmental management has become an important issue in the hospitality industry, with more and more hotels adopting sound environmental management practices in response to the growing concerns for sustainable tourism products. Another key reason is that the hotel sector consumes far more water than the other types of establishments; thereby water savings can have a big impact on their expenses. In addition, the hotel sectors' financial capacity or easy access to loans and subsidies makes (for hotels) more affordable / feasible an investment in water efficiency technologies, which is characterised by high upfront costs and large payback periods.

6.1 Water management solutions: overview

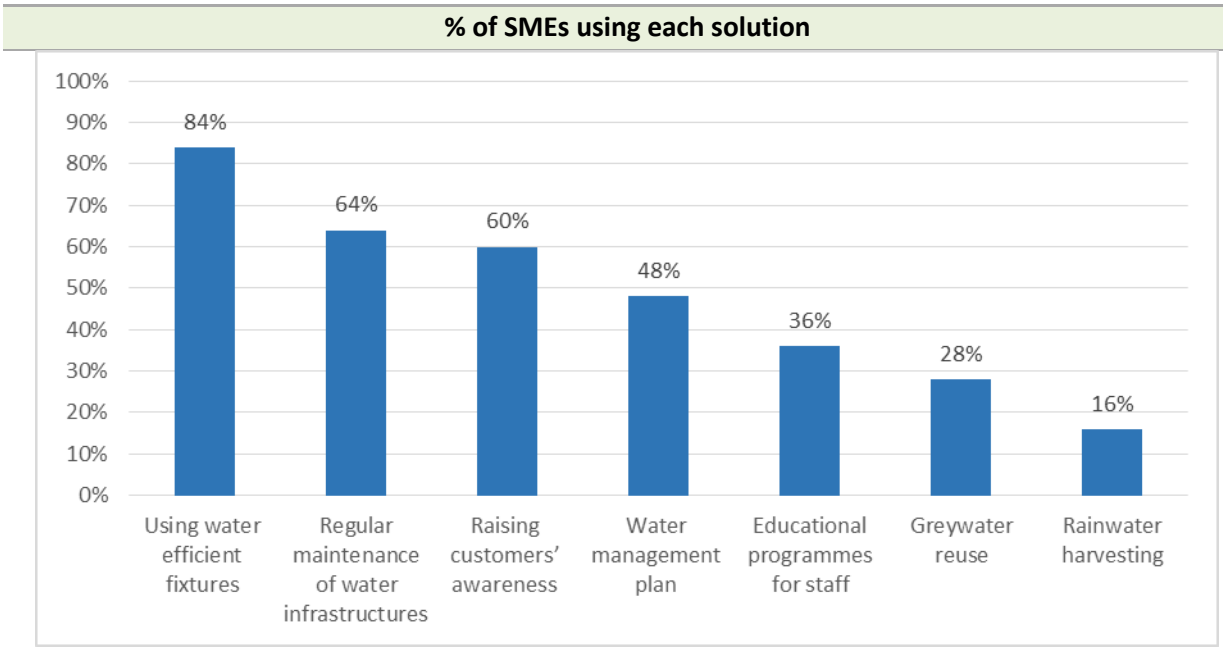
To estimate the diffusion of water management solutions in the MED, CASTWATER partners gathered data from 25 tourism SMEs in a questionnaire based survey aiming to highlight the degree of proliferation of various such solutions.

Survey results show that water efficient fixtures (e.g. pressure regulators, low-flush toilets, irrigation technologies) account for 84% of all the solutions adopted by tourism establishments. The main reason is that tourism SMEs can decrease indoor water consumption by 30% by installing water efficient fixtures, while there is even greater potential to reduce outdoor water demand. What is more, they are not associated with high investment costs and the payback period does not usually exceed two years. Maintenance is also recognised as a key measure for saving water resources. More than half (i.e. 64%) of the tourism SMEs have established a regular maintenance program for plumbing infrastructures and water devices/appliances. The main objective is to minimise the occurrence of malfunctions and leaks, which account for a significant share of indirect water use. Initiatives to raise customers' awareness on water issues follow with 60%.

The majority strives to make the use of water resources more prudent and to prevent wasteful practices by informing customers about water scarcity and sustainable water management, whilst seeking to increase their commitment/willingness to participate in sustainability practices. This is mostly realised through signs with instructions and tips on how to minimise water consumption and by employing linen

and towel reuse programs. Creating a comprehensive water management plan is also a key component of a successful water management strategy. 48% of tourism SMEs have elaborated a water conservation program to prescribe the different measures to be taken and set specific targets and goals.

Figure 12: Water management solutions adopted by tourism SMEs



Solution	Number of SMEs
Using water efficient fixtures	21
Regular maintenance of water infrastructures	16
Raising customers' awareness	15
Water management plan	12
Educational programmes for staff	9
Greywater reuse	7
Rainwater harvesting	4
Other	8

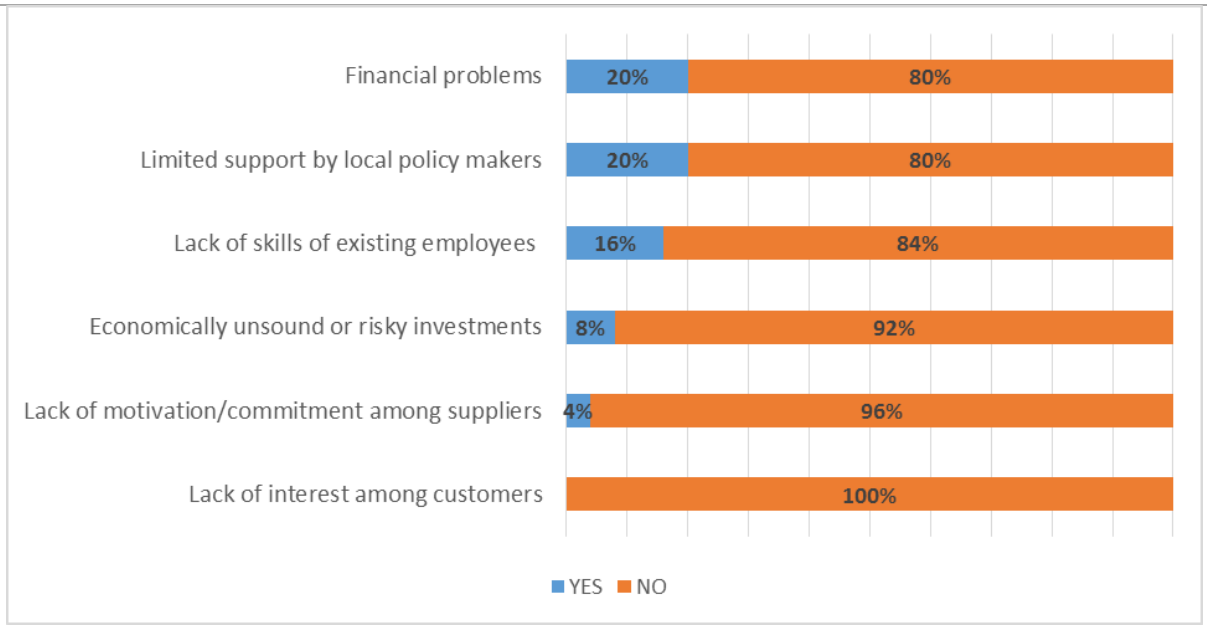
Source: CASTWATER A3.5 results

As regards measures aiming to increase the availability of water, the use of greywater and rainwater harvesting systems appear to be a less popular option for tourism SMEs. The main reason is that the overall costs installing a greywater or rainwater harvesting system are far greater than implementing soft measures (e.g. regular maintenance, raising customers' awareness, and training staff) or purchasing low cost water efficient appliances. Indicatively, the return on investment (or else payback period) for a greywater reuse system may exceed five years. Finally, it must be highlighted that the big majority (80%)

has employed a multifaceted approach, adopting a series of different measures to reduce water consumption and promote environmental protection.

Nevertheless, the implementation of these water efficiency measures was not without problems. Survey results show that 3 out of 4 tourism SMEs have encountered difficulties (at least one difficulty) prior or during the implementation of water efficiency measures. The following figure presents the main problems noticed during the implementation of water efficiency measures found in the CASTWATER survey:

Figure13: Problems encountered by tourism SMEs prior & during the implementation of measures



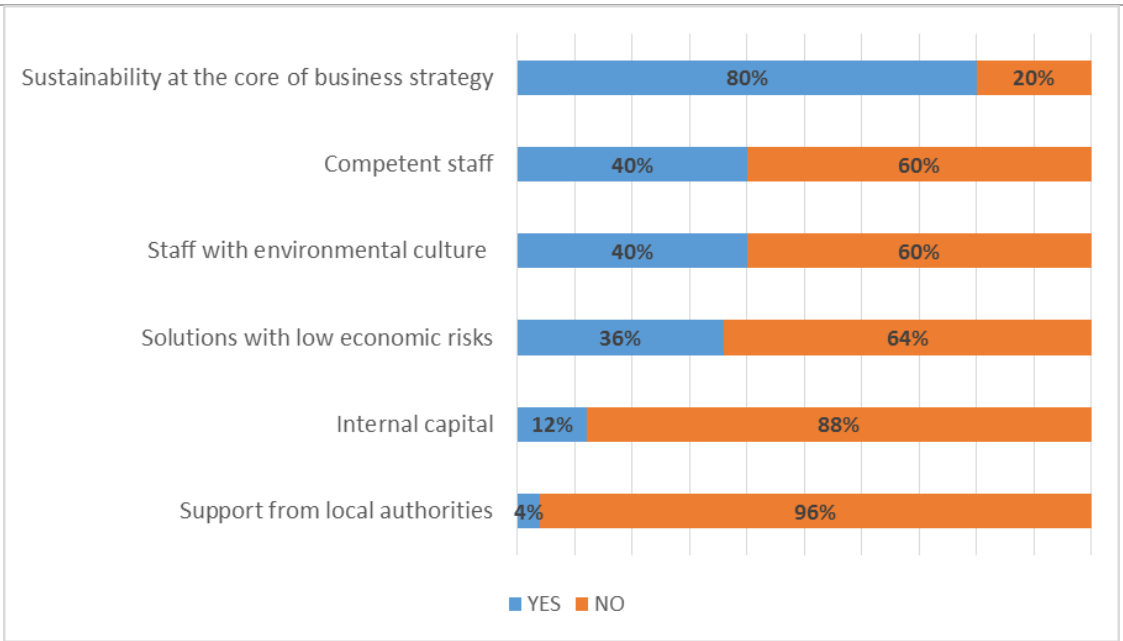
Problems	"Yes"
Funding, lack of financial resources	5
Regulation / limited support by local policy makers	5
Lack of expertise / skills of existing employees	4
Economically unsound or risky investments	2
Lack of motivation and commitment among suppliers	1
No problems encountered	6
Other	1

Source: CASTWATER A3.5 results

Nevertheless, the extent of these difficulties did not pose major obstacles that could essentially prevent such investments. In fact, their implementation can be rendered easier through the presence of a number of key enablers. More precisely, the CASTWATER study showed that factors such as business' strategic

focus on sustainability (80%), the availability of staff with environmental culture and competent to perform water management procedures and use water efficiency technologies (40%), as well as low economic risks (36%) have been seen as the key drivers for the successful adoption/implementation of water efficient measures. In contrast, the lack of internal capitals (12%) and the limited support received by public authorities (4%) have been identified as the main barriers to the adoption of sustainable water management solutions. The enablers for the implementation of water efficiency measures are summarised in the figure below:

Figure 14: Perceived enablers for the adoption of sustainable water management measures by SMEs

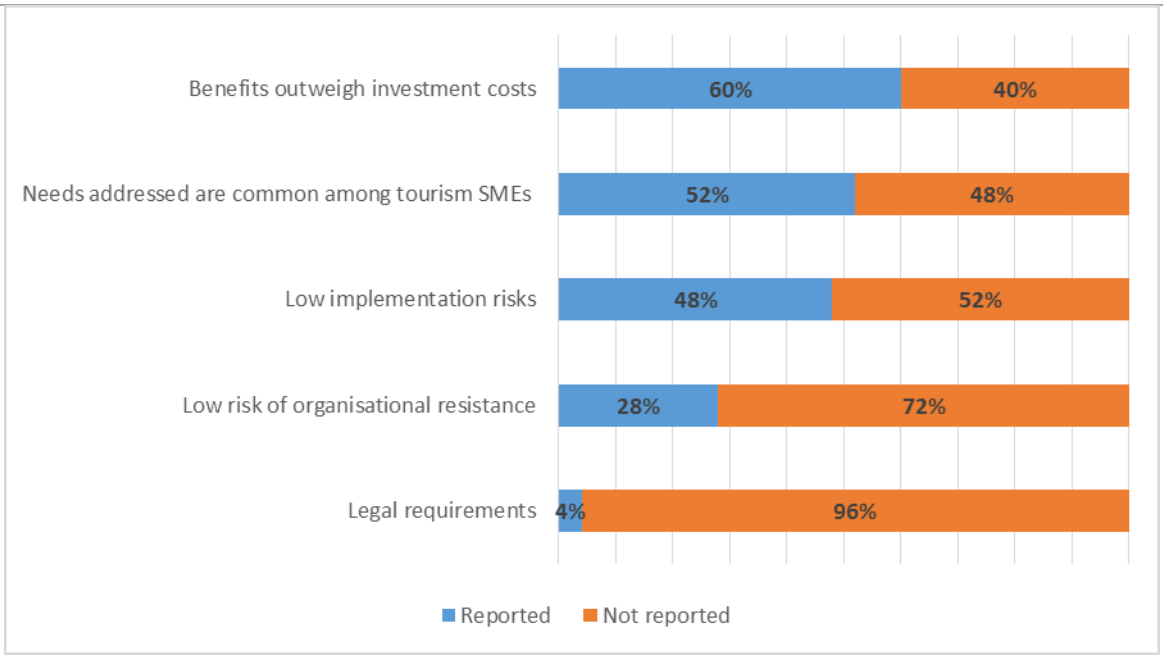


Results	"Yes"
Sustainability is at the core of business strategy	20
Staff with environmental culture	10
Staff competent to perform water management procedures	10
Low economic risks	9
Internal capital	3
Support from local authorities	1
Other	3

Source: CASTWATER A3.5 results

Beyond the enablers for the implementation of water sustainability measures, there are also factors that foster the transferability, generalizability and scalability potential of water efficiency measures. Generalizability can be defined as the extension of research findings and conclusions from a study carried out on a specific sample to the large population, while transferability refers to the process of applying a particular approach to other similar situations or settings. The CASTWATER study demonstrates that a sustainable water management practice can be transferable, only if a number of conditions are satisfied. The most important (reported) factors in determining a case's transferability is a) the demonstrated achieved benefits to outweigh the investment costs (60%) and b) the compatibility of needs addressed by the particular practice among the different tourism establishments and regions in Mediterranean (52%). Additional key elements have to do with the low implementation risks (48%) and the low risk of organisational resistance within tourism SMES (28%). In addition, scalability is a key component of transferability, as it entails not only the creation of internal economies of scale for SMEs adopting a number of sustainable water management solutions, but also the emergence of external economies of scale in the case the tourism industry's scope of operations expands due to, for example the emergence of a niche market for sustainable tourism products or/and the construction of modern public water infrastructures. The following figure summarises the factors that foster the transferability potential of water efficiency solutions:

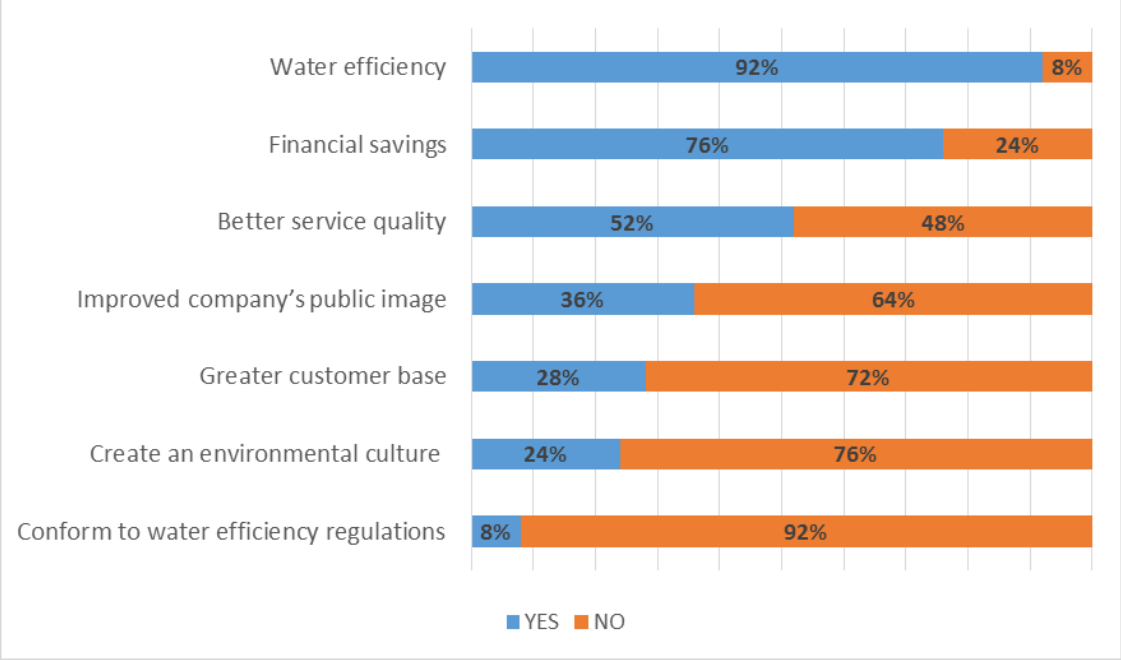
Figure 15: Factors influencing the transferability of examined cases in a positive way



Factors	Reported
Demonstrated achieved benefits outweigh investment costs by far	15
Needs addressed are common among tourism SMEs across MED regions	13
Low implementation risks	12
Low risk of organisational resistance	7
Legal requirements	1
Other	2

Regardless of their transferability, the implementation of water efficiency measures leads to substantial benefits which are noticed by the tourism SMEs themselves. In fact, sustainable water management entails considerable benefits that are not limited to improve water efficiency, but can include economic, societal and political benefits. From an environmental perspective, it allows to address key environmental issues threatening the Mediterranean Region such as water scarcity, soil erosion, deforestation, biodiversity loss and natural landscape degradation. The shift towards sustainability practices will also contribute to MED regions' need to diversify their tourism, by adding sustainable tourism as a complementary approach to the current tourism paradigm. What is more, tourism establishments with an environmental focus will act as dissemination channels and reference points, assisting to raise environmental awareness and create a sustainability culture within the society. Finally, sustainable water management can lead to substantial financial savings for the tourism SMEs mostly through lower water bills and less expenses for maintenance and repairing. The following figure summarises the positive effects from the implementation of water efficiency measures:

Figure 16: Achieved benefits from water efficiency measures adopted by SMEs



Results	"Yes"
Water efficiency & resource savings	23
Profitability & financial savings	19
Better service quality	13
Improved company's public image	9
Greater customer base	7
Create an environmental culture	6
Conform to water efficiency regulations	2
Other	2

Source: CASTWATER A3.5 results

The adoption of water efficiency measures has been found by CASTWATER partners to generate positive environmental, economic and branding outcomes. Figure 6 presents an overview of the benefits created by the cases analysed. Evidence shows that 92% of tourism SMEs managed to enhance their environmental performance (i.e. water efficiency and resource savings) via the implementation of water efficiency measures. Environmental benefits are followed by economic and branding improvements. The majority (76%) of tourism SMEs report significant financial savings stemming from decreased water consumption and less repairing works. Half (52%) of tourism SMEs managed to increase clients' satisfaction score via demonstrating compliance with sustainability principles and providing better service quality. Another key benefit is the improvement of SMEs' brand. Tourism SMEs, which have adopted a sustainable water management policy, achieved to receive public recognition for their initiatives (36%),

expand their customer base by attracting visitors that are particularly focused on environmental sustainability (28%) and contribute in creating an environmental culture within the society (24%).

6.2 Recommended actions to increase water efficiency in tourism

To encapsulate the analysis of the previous paragraphs, the following table summarises the key recommendations on how to improve water efficiency in the tourism industry, as they were derived from CASTWATER research in the deliverables of activity A3.5 ("Good practice guide on the adoption of sustainable tourism water management solutions by SMEs"):

Table 2: Key CASTWATER research recommendations for improving water efficiency in tourism

Area	Actions to be taken
Creating a water conservation program	▪ Conduct a water audit to measure water consumption, identify the major water costs and determine where savings can be achieved. ▪ Compare consumption figures with tourism industry benchmarks (if available) to determine the potential for savings. ▪ Evaluate company's financial performance or status, to check the feasibility/viability of the project. ▪ Search for funding opportunities (e.g. grants, preferential loans) from EU financial schemes, governmental sources, foundations, professional associations, and financial institutions. ▪ Monitor calls for projects on new water technologies or/and water reduction schemes. ▪ Establish realistic water reduction targets for each department (e.g. kitchen, guest rooms, gardens, etc.) and the entire establishment. ▪ Prescribe a series of potential water management measures to minimise consumption, based on company's needs and priorities, as well as facilities' technical specifications. ▪ Carry out a cost-benefit analysis to make informed decisions about the actions to be taken. This will enable to determine if a measure is viable and feasible, and to compare it with other solutions so as to determine which is the more feasible and effective. What is more, tourism SMEs should calculate the payback period (or else the return on investment for all suggested measures.
Accommodation	▪ Install or retrofit flow/pressures regulators and aerators on showerheads to decrease consumption by approximately 40%. ▪ Install sensors or timers to control faucets so that they do not keep running for a long time if left open. ▪ Select low flush or dual flush toilets to achieve substantial water savings (approximately 30%).

	▪ Use rainwater or pool water for toilet flushing. This requires the installation of a rainwater harvesting system. ▪ Carry out regular inspections and routine maintenance to prevent leaks and malfunctions in plumbing infrastructure and water appliances.
Laundry	▪ Sort the laundry according to the degree of soiling. ▪ Use washing machines on full load to reduce the number of rinse cycles, without reducing quality. ▪ Reuse the water from previous rinse cycles for the first wash of the next cycle. This can be realised by installing temporary holding tanks. ▪ Avoid to pre-wash clothes and use water saving programmes. This can result in a 25% reduction in water consumption. ▪ Avoid to use high polluting detergents and cleaning products to allow water reuse for toilet flushing and irrigation. ▪ Check regularly for leaks in laundry equipment (e.g. dump valves, inlet valves, tanks) to avoid excessive water usage.
Kitchen	▪ Use low-flow pressure spray valves for pre-washing. ▪ Soak dishes in a basin of water before placing them into the dishwasher in order to minimise pre-washing time. ▪ Use dishwashers on full load and turn off the devices when not in use. ▪ Avoid the excessive use of detergent and cleaning products, allowing to re-use water from washing machines for removing food residues on dishes (during the pre-washing stage). ▪ Purchase water efficient washing and cooking appliances such as dishwashers, ice machines and steam cookers. This will enable to decrease water and energy consumption by at least 10%. ▪ Avoid to defrost food using water and minimise the use of ice machines.
Swimming pool	▪ Determine the appropriate sizing before installing a swimming pool, taking into account the envisioned use(s), facilities' capacity and maintenance costs. ▪ Use pool covers during closing hours to minimise evaporation and reduce the need to empty and refill. ▪ Use level sensors to prevent overflow. ▪ Install sensors or timers to control showers by the pool. ▪ Conduct routine inspections/reviews on filtration plant's effectiveness, including regular maintenance to prevent leaks and malfunctions. ▪ Consider to reuse pool water for toilet flushing and other washing purposes.
Irrigation	▪ Install an efficient irrigation system to optimise water usage for gardening based on environmental conditions. This may include fitting timers on sprinklers to control water use and moisture sensors to avoid over-watering. ▪ Plant green areas with species that minimise irrigation requirements and are adjusted to areas' humidity level.

	▪ Schedule gardening either early in the morning or late in the evening to prevent water loss due to evaporation. ▪ Select soil with high water holding capacity for landscaping works to reduce infiltration loss. ▪ Check regularly for leaks and malfunctions in irrigation equipment. ▪ Consider to use greywater from baths and sinks or waste water (after appropriate treatment) for irrigation.
Training staff	▪ Communicate company's commitment to promote water conservation, including water reduction targets to all employees. ▪ Train staff on how to perform water management procedures, make prudent use of water and use new technologies and water devices for optimum resource efficiency. ▪ Encourage staff to suggest new ways and measures to decrease water consumption. ▪ Establish a reward system for employees that show a strong commitment to promote water conservation and achieve the targets set by the enterprise.
Engaging customers	▪ Communicate the problem of water scarcity and its impact on the environment, economy and local community. ▪ Inform customers about the measures adopted by the enterprise for diminishing water consumption during peak touristic seasons. ▪ Invite customers to reuse towels and linens. ▪ Display water saving notices to raise customers' awareness on water conservation. ▪ Encourage guests to abolish wasteful practices (e.g. long-time showers, letting the tap run when brushing teeth). ▪ Invite customers to report malfunctions and leakages in water appliances and infrastructures. ▪ Suggest ways to diminish water consumption in all areas/departments of the establishment.

Having concluded the general presentation of the characteristics of the process for achieving water efficiency in tourism, in the Best Practice Manual of this toolkit, readers can find a portfolio of descriptions of transferable cases that showcase the best practices already applied to achieve water sustainability in the EU tourism sector.

6.3 Key learning points of Module 3

- Strategies aiming to increase water availability to improve water sustainability in tourism focus on implementing water recycling/reuse infrastructures.
- Most common strategies aiming to increase water availability are greywater reuse and rainwater harvesting.
- Strategies aiming, so as to improve water sustainability in tourism refer to measures/solution, aiming to achieve institutional change and change in consumer (tourists') behaviour.

- Most common strategies to adjust water demand and reduce water consumption are creating a water management plan, using water efficient fixtures, applying regular maintenance of water infrastructures, designing and implementing educational programmes for staff, and raising customers' awareness.
- Learn the results of the CASTWATER survey about:
    - Most common water management solutions applied by tourism SMEs and businesses.
    - Most common problems encountered during the implementation of such solutions.
    - Most common enablers for the adoption and transfer of water efficiency solutions.
    - Most common benefits generated from the adoption of water efficiency solutions.
- Remember the suggested actions for increases in water efficiency across a number of different services provided by tourism SMEs and businesses.

7 Module 4: Learning how to design conflict resolution mechanisms

Self-learning targets:

1. ***Understanding the need to set increases in water sustainability in tourism businesses as the epicenter of conflict resolution***
2. ***Finding out the key actions to increase the sustainability of water in tourism businesses and SMEs for each key type of their activities.***

7.1 Overview

Conflict resolution mechanisms refer to a broad array of tools used to anticipate, prevent and react to conflicts that emerge during the implementation of integrated water resource management and in general water efficiency measures. Conflict resolution is in need of a conflict management strategy that involves a combination of several types of policy tools, used to help public authorities open up, identify the issues behind the positions of various conflicting stakeholders and find out 'win-win' solutions that leave all parties better off with the outcome.

The first thing public sector representatives and employees should remember when trying to resolve conflicts is **that stakeholder participation and engagement** are the key not only to to sustainable use and management of water resources, but also to the resolution of conflicts arising during this process. Stakeholder engagement in tourism should be conducted according to the following principles (CEO Water Mandate, 2010, p. 7):

Principle 1: Intent to advance water management that is sustainable. Responsible corporate engagement in water policy must be motivated by a genuine interest in furthering efficient, equitable, and ecologically sustainable water management.

Principle 2: Respecting public and private roles. Responsible corporate engagement in water policy entails ensuring that activities do not infringe upon, but rather support, the government's mandate and responsibilities to develop and implement water policy. This includes business commitment to work within a well-regulated (and enforced) environment.

Principle 3: Inclusiveness and partnerships in engagement. Responsible engagement in water policy promotes inclusiveness and meaningful partnerships across a wide range of interests.

Principle 4: Pragmatic and integrated engagement. Responsible engagement in water policy proceeds in a coherent manner that recognizes the interconnectedness between water and many other policy arenas.

It is a proactive approach rather than responsive to events and is cognizant of, and sensitive to, the environmental, social, cultural, and political contexts within which it takes place.

Principle 5: Accountability and transparency in engagement. Companies engaged in responsible water policy are fully transparent and accountable for their role in a way that ensures alignment with sustainable water management and promotes trust among stakeholders.

Nevertheless, public authorities should not consider successful stakeholder engagement and conflict resolution as their most important goal. Instead, public authorities should—to the extent that is possible—prepare regulation that ensures the preservation of water resources and the environment despite the possibility of conflict ensuing because of changes in water usage by tourism enterprises or tourists. After making sure that water sustainability in tourism has been successfully promoted, public authorities should then anticipate and try to resolve any potential conflicts developing due to such regulation. Preparing for the possibility of future conflict is an important element of conflict resolution itself. Hence, it is reasonable to conclude that within a touristic area, where disputes might arise occasionally, it would be useful to enable the discussion of these issues through stakeholder meetings and communication with each other regarding interests, needs and positions. While there are no standard methodologies for undertaking this process, the important thing is to create an enabling environment whereby the stakeholders are able to actively participate in the policy dialogues and subsequent planning and design, as well as to be capable of entering into and carrying out an agreement.

However, successful stakeholder engagement can take place only if stakeholders and, in general, inhabitants of touristic areas in need of water sustainability have developed a clear understanding of the fact that natural water resources need to be preserved and used moderately. Correspondingly, tourism businesses and SMEs in the area should be committed to the implementation of measures and tools enabling sustainable water management. However, even understanding and commitment cannot promote water sustainability in tourism efficiently if they do not lead to **mutual gain for all parties** supporting and applying water efficiency measures. If all parties believe that they can achieve a better outcome through unilateral action, they will not be willing to participate in the process, therefore the key to success of conflict resolution is to convince all parties that they will be better off through cooperative action. Additionally, all interested parties should have the opportunity to participate in the process. It is important, in working towards consensus, to identify interests rather than positions. In general, increasing the role of inhabitants and local authorities in managing the water resource is key to eliminating conflict in the future.

Furthermore, another prerequisite for the successful prevention and resolution of conflicts is the implementation of **efficienct monitoring** processes of the implementation of policy measures. Within this context, the more parties participate in the monitoring process, the better. In fact, joint monitoring can contribute towards a more effective management of the development cooperation. Setting specific objectives is to define realistic conditions for such missions through exchanges of ideas and dialogue

between all parties that would enable them to engage in the future in joint monitoring missions. The promotion and support of joint monitoring of activities, involving collaborative schemes of the parties, will enable the planning of the collection, analysis and use management of information concerning joint investments. Additionally, it supports ownership and mutual accountability of the management systems and builds on the development of common responsibility. It generates information about whether or not development is being achieved through a joint investment and therefore supports results-oriented management approaches.

Finally, successful conflict resolution depends on the development of **mechanisms that specialise in dispute management**. During the processes that lead to the development of an agreement by stakeholders in direct negotiation, based on mutual understanding, there are many ways to deal with disputes. There is a list of alternative or appropriate dispute resolutions that authorities may choose to use, with the intent of removing a potential source of conflict, preventing its escalation into a dispute, and finding the way back to a constructive cooperative and a potentially productive future working relationship. Alternative dispute resolution refers to a set of approaches and techniques aimed at resolving disputes in a non-confrontational way. It covers a broad range of approaches with the simplest form to take the party-to-party engagement in negotiations, as the most direct way to reach a mutually accepted resolution, to mediation at the other end, where an external party imposes a solution. The tendency for resolution in the water management is to use *interest-based negotiation and mediation*, equitable and reasonable use of water and reach an agreement where the parties will jointly manage the shared water resources. The Water Allocation System (WAS) model and its multiyear extension (MYWAS) are examples of policy tools that can be used not only for domestic management but also for resolving water disputes.

7.2 Cooperation improvement and conflict management recommendations

Following the rationale of the overview in the previous section and according to the results of research conducted in the context of CASTWATER A3.3 activity, these are the policy recommendations for improving cooperation and resolving conflicts to enhance water sustainability in tourism:

- *Improve capacity building mechanisms for addressing the specific problems encountered by EU Mediterranean territorial authorities*

  All stakeholders should be encouraged to build capacity for sustainable tourism and apply this capacity in their internal operations as well as to influence the decision of other stakeholders. Financial, administrative, as well as monitoring problems in water management could be tackled by the capacities of tourism stakeholders alongside public authorities, enabling them to build sustainable tourism initiatives.

- *Integrate tourism sector stakeholders in the decision making process and forward joint management policy tools*.

Tourism establishments and tourism enterprises, tourist associations, NGOs, academia and knowledge-brokers should be involved in the decision making process for the achievement of sustainable tourism objectives regarding water management. By involving stakeholders in the planning process, joint responsibility among all relevant actors is established, leading to better management of scarce water resources.

- *Foster commitment to implementation for tourism stakeholders*.

  Tourism businesses should be committed to implement the agreed range of tools enabling water management. Increasing the role of relevant tourism stakeholders, together with visitors and the local authorities, management of water resources can be effectively implement actions with greater impact.

- *Promote alternative dispute resolution mechanisms*.

  Many EU Mediterranean territorial authorities lack adequate mechanisms of mitigating water conflict. Alternative dispute resolution refers to a set of approaches and techniques aimed at resolving disputes in a non-confrontational way. It covers a broad range of approaches with the simplest form to take the party-to-party engagement in negotiations, as the most direct way to reach a mutually accepted resolution, to mediation at the other end, where an external party imposes a solution. The tendency for resolution in the water management is to use interest-based negotiation and mediation, equitable and reasonable use of water and reach an agreement where the parties will jointly manage the shared water resources. The Water Allocation System (WAS) model and its multiyear extension (MYWAS) is one of the policy tools not only for domestic management but also for resolving water disputes.

- *Develop scenarios of future conflict for predicting necessary conflict mechanisms*.

  It includes scenarios as diverse as the peaceful resolution of an inter-communal dispute over access to a particular water source to mitigating the effects of intense conflict on water quality, infrastructure, and institutions in urban environments. Even when water is not directly connected to the proximate causes of conflict, it is essential to consider the many ways that water insecurity, which is most often derived from water resource management configurations, could be interacting with the social and institutional dynamics in fragile or conflict-affected situations.

7.3 Key learning points of Module 4

- Efficient conflict resolution is a crucial aspect of facilitating the improvements in water efficiency in tourism.

- Stakeholder participation and engagement is the key to the resolution of conflicts.

- Public authorities should anticipate and try to resolve any potential conflicts developing due to regulation for the sustainability of water in tourism, only after making sure that water sustainability in tourism has been successfully supported & promoted.

- To resolve conflicts, inhabitants of touristic areas in need of water sustainability need to develop a clear understanding of the fact that natural water resources have to be preserved and used moderately.

- Conflict resolution should lead to mutual gain for all parties supporting and applying water efficiency measures.

- A prerequisite for the successful prevention and resolution of conflicts is the implementation of efficient monitoring processes of the implementation of policy measures.

- Successful conflict resolution depends on the development of mechanisms that specialise in dispute management.

- The tendency for resolution in the water management is to use interest-based negotiation and mediation, equitable and reasonable use of water and reach an agreement where the parties will jointly manage the shared water resources.

- There is a clear lack of alternative dispute resolution mechanisms in the majority of CASTWATER regions for mitigating water conflicts emerging in most tourist areas. Additionally, cooperation improvement through increased tourism stakeholders' participation could substantially accelerate the emergence of alternative patterns of preventing conflict in tourism water resource management.

8 Module 5: Comparative policy analysis recommendations

Self-learning targets:

1. ***Understanding the characteristics and features of current policy making in EU Mediterranean countries aimed at improving water sustainability in tourism businesses***
2. ***Finding out the best policy recommendations aimed at improving water sustainability in tourism businesses***

8.1 Overview

This chapter aims to highlight the key aspects of policies promoting efficient use of water resources in tourism by presenting the results of a comparative policy analysis for this issue conducted within the context of the CASTWATER project (Activity A3.3). Providing comparative cross-regional evidence on this subject of public policy sheds light to similarities and differences among CASTWATER regions, determining common issues, disclosing actual policy gaps, and facilitating knowledge exchange. Readers of this chapter will be able to a) learn the key types of policy interventions that take place in EU countries of the Mediterranean, b) become familiar with key methods for successful policy implementation in this area and problems that might arise during this process, and c) receive concrete policy recommendations that can be integrated in their policy making to improve it. The comparative policy analysis has indicated that there are four main types of policy interventions aiming to address the issue of water efficiency in tourism.

A) Cooperation improvement & conflict management:

It refers to existing mechanisms that mitigate the implementation problems of the regulatory framework as well as to the cooperative efforts of stakeholders for better management of water resources. Policies encounter unforeseen difficulties that can truncate their objectives and hinder their implementation. Conflict resolution mechanisms and alternative dispute resolution methods are two common ways to tackle the difficulties encountered throughout the implementation process.

B) Integrated planning:

It refers to the existence of comprehensive institutional regulations that support the control, direction or implementation of an adopted policy affecting tourism water management. Definitions of competent actors, administrative positions, water units, objectives, criteria, management plans and implementation procedures, as well as monitoring mechanisms, are all part of the integrated planning. This kind of

framework can correspond to various levels of governance (local/regional/national), usually establishing their complementarity.

The existence of a robust and effective policy framework for water resource management is crucial for climate change adaptation, regional stability, and economic growth. Cross-regional cooperation in the Mediterranean coastal areas can liberate dormant possibilities in water policies effectiveness and in the utilisation of innovative technical capacities. The increased pressure from tourism activities in these areas demands sustainable development of water resource management and heightened coordination among relevant stakeholders. Advanced water monitoring and information systems enable cross-sector integration of policies and facilitate knowledge and experience sharing, assisting essentially in a holistic water management.

C) Infrastructure development:

Efficient water management requires the development, sustaining, and improvement of various infrastructure networks. This category refers to the infrastructure and technological development related to water management, incorporating water treatment facilities and its support systems, ranging from the water reuse facilities to technologies detecting water leakages.

D) Incentives and public awareness:

It refers to all the strategic ways policies aim to influence the behaviour of individuals and businesses. These include incentives targeting general customers through pricing mechanisms, tourism facilities through eco-labeling, and raising public awareness through informational and/or educational campaigns of any type.

This amended fourfold classification allows clearer coding of results, avoiding overlapping label descriptions, moving towards a more cohesive approach for presenting policies on efficient water management in the tourism sector. Since conflict resolution and cooperation improvement is a reactive type of policies—in the sense that these are attempts to react and shape stakeholders behaviour—that was covered in the previous chapter, this chapter will present the remaining three types of proactive policy intervention.

8.2 Integrated planning

Integrated planning is a proactive type of policy intervention that aims to provide direction to public and private sector stakeholders so as to achieve specific policy goals by designing and editing plans and guidelines. According to the CASTWATER comparative policy analysis, there is no comprehensive water management regulatory planning and framework targeted specifically to tourist activities. Instead, all CASTWATER partners from all European Union Mediterranean countries depicted a fractured regulatory framework concerning tourism water management. Hence, to describe the extisting plans aiming to

promote water efficiency in tourism and to develop an understanding of their strengths and weaknesses, it is necessary to investigate relevant plans directed to the overall water management in European Union Mediterranean countries. The three distinct types of planning currently regulating water management in tourism are:

- The implementation of the EU Water Framework Directive in CASTWATER regions.
- Policies dictating water management on the national and regional level.
- The national framework defining monitoring mechanisms for water management.

8.2.1 WFD implementation

The first regulatory framework area affecting tourism water management is the implementation of the EU Water Framework Directive 2000/60/EC (WFD hereafter) in CASTWATER regions. The WFD is one of the most comprehensive and ambitious pieces of EU environmental legislation. Its main objective is to achieve 'good status' for all EU waters, including fresh, transitional (river mouths) and coastal waters. It is currently in its second cycle (2016-2020). The WFD is complemented by a number of other EU laws governing specific aspects of water policy, which all contribute to achieving good status. These include urban wastewater, nitrates, industrial emissions, pesticides, bathing and drinking water.

WFD is implemented in EU regions per river basin, and the River Basin Management Plan serves as the framework of all relevant measures for effective water management. All partners' regions reported the existence of RBMPs for their territories. The table below shows the status of RBMPs for each CASTWATER region:

Table 3: RBMP staturs in CASTWATER regions

No.	Partner	Country/NUTS2	RBMP status
1	Municipality of Rethymno	Greece/Crete	2nd version – 29/12/2017
2	Directorate General for Industrial Production, Trade and Tourism	Italy/Emilia-Romagna	2nd version – 27/10/2016
3	Tourism Department	Italy/Veneto	2nd version – 27/10/2016
4	Water Board Lemesos	Cyprus	2nd version – 07/10/2016
5	University of Patras	Greece/Western Greece	2nd version – 29/12/2017
6	Euromediterranean Water Institute Foundation	Spain/Región de Murcia	2nd version – 19/01/2016
7	Institute of Agriculture and Tourism	Croatia/Jadranska Hrvatska	2nd version – 06/07/2016
8	Las Naves - Foundation of the Valentian Community to promote	Spain/Comunidad Valencian	2nd version – 19/01/2016

	strategic urban development and innovation		
9	Departmental Council of Herault	France/Languedoc-Roussillon	2nd version – 20/12/2015
10	Malta Regional Development and Dialogue Foundation	Malta	2nd version – 06/04/2016
11	Energy and Water Agency	Malta	2nd version – 06/04/2016

RBMPs are accompanied with a Programme of Measures (PoM), itself divided in Basic and Supplementary Measures. Basic measures address the necessary minimum requirements and are linked to the implementation of the pre-WFD Community water protection legislation, as well as to other WFD-specific basic measures, i.e. mostly administrative and regulatory instruments which should enable the authorities to exert control over all activities that can have a significant impact on water bodies. The supplementary measures are of diverse nature and allow each state to promote its separate agenda as long as they help each River Basin District (RBD) to achieve the WFD environmental objectives.

2 out of 11 partners reported measures directly targeted to tourism water management included in the RBMPs. CASTWATER partners failed to report tourism water management measures existing in their RBDMPs' PoMs apart from two cases (Rethymno, Malta). This is striking considering that CASTWATER regions are heavily impacted from tourism activities, sometimes water demand rising considerably in summer months. A clear policy gap emerges among partners' RBMPs, the absence of measures specifically targeting tourism water use.

Rethymno reported relevant measures in its PoM. The PoM of Crete (PoMC) defined 46 Basic Measures whose content ranges from administrative actions to infrastructure development, to additional research and services actions. Also, the PoMC defined 45 Supplementary Measures, 3 of which are measures targeted to tourism water management. These 3 Supplementary Measures proposed setting in place agreements among tourism facilities (hotels, golf fields, water parks etc.) and relevant authorities for more effective water management.

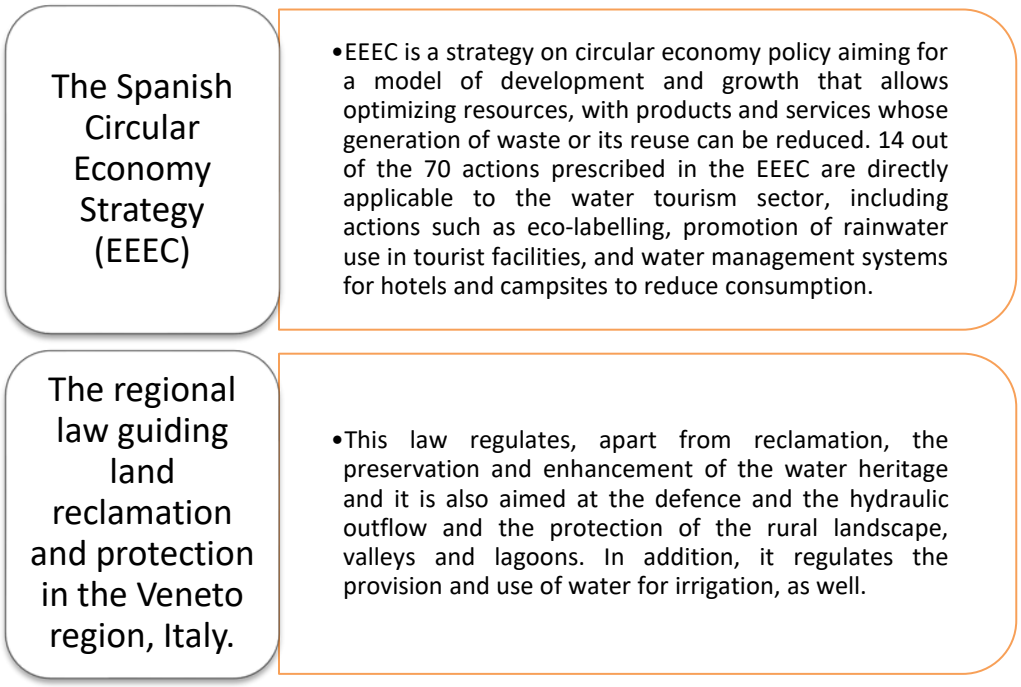
Malta reported measures included in the PoM specifically addressing tourism sector's capacity in the production of non-conventional water resources. These measures support the diversification of water supply in the tourism sector through the further adoption of sea-water desalination technology and water treatment systems.

8.2.2 Complementary national/regional framework

The second planning and regulatory area affecting tourism water management is the national/regional policies accompanying the general regulatory framework of WFD transposition in each country. These policies only indirectly refer to water management, yet complement the WFD implementation with substantial environmental, energy-saving, circular economy measures relating to tourist activities.

Apart from the transposition of WFD in each country, a network of other national regulations is in place, affecting indirectly sustainable tourism water management. These regulations usually do not refer to the water management itself, but complement the main policy from different angles, being for example regulations about efficient water pool use, climate change regulations, and/or energy-saving directives. **CASTWATER partners described at least 1 complementary measure of national/regional importance relating to tourism water management**. Examples of such national plans can be seen in the following figure:

Figure 37: Examples of national regulatory frameworks



The documentation of national/regional policies substantially complementing WFD implementation in partner countries shows **the fragmented landscape of water resource management policies as well as the lack of unified approach**. Although there is a policy framework in place addressing water management from multiple policy angles, the absence of a single comprehensive policy framework on tourism water management is obvious. As a result, tourism water needs are addressed from neighbouring types of policies, such as circular economy frameworks, eco-labelling schemes, regulations related to water pool use.

8.2.3 Monitoring framework

The third planning and regulatory area affecting tourism water management is the existence of a monitoring network. Advanced water information systems assist with sustainable water policy management by effectively processing and accurately representing various data, proving useful for

facilitating specific policy measures, assisting water users in making significant decisions more effectively and allowing businesses and public authorities to better address risks from water-related events.

Adequate water information and monitoring systems are pivotal in sustainable water policy management. **Data analysis indicates that all CASTWATER partners have adequate water consumption monitoring systems in place.** The key policies of water information and data systems focus on strengthening these systems at a national and regional level, introducing innovative technologies and improving management measures. For example, the Institute of Agriculture and Tourism, Croatia, reported policies aiming at improving water monitoring systems, and the CASTWATER region of the Departmental Council of Herault as well as Water Board Lemesos, Cyprus, reported the introduction of innovations in water information and monitoring systems (remote metering of subscriber counters/smart metering).

However, equally all partners reported the lack of a monitoring system specifically designed for tourist activities, collecting information on tourism water consumption. The ongoing challenges from CASTWATER partners regard the upgrading and integration of water information and data systems into a unified water management framework that includes information from tourist activities and facilities, such as hotel water consumption, golf course water management. Upgrading a regional water information system is a long-term task, but an important one in the Mediterranean basin, which is severely affected by climate change, tourism activities, and increased drought risk.

8.3 Infrastructure development

Infrastructure development is another type of proactive policy making and implementation directed towards creating solid foundations for achieving water sustainability in tourism. Water resource infrastructure amelioration facilitates the productive use of water, securing sustainable resource management. It is safe to say that without the proper infrastructure, all policies directed towards water efficiency in tourism are doomed to fail.

Nevertheless, even though the need for proper infrastructure is ubiquitous, it is necessary to point out that not all regions have the same needs and priorities in infrastructure development. Geography, climate, and history of human development in each territory mean that in some cases 'adequate' infrastructure means that major works and structures – dams and reservoirs, river basin management, flood control, water transfer schemes, etc. –have been developed, while elsewhere smaller and more diffuse infrastructure may suffice.

CASTWATER comparative policy analysis revealed the following two patterns with regards to infrastructure development in Mediterranean countries.

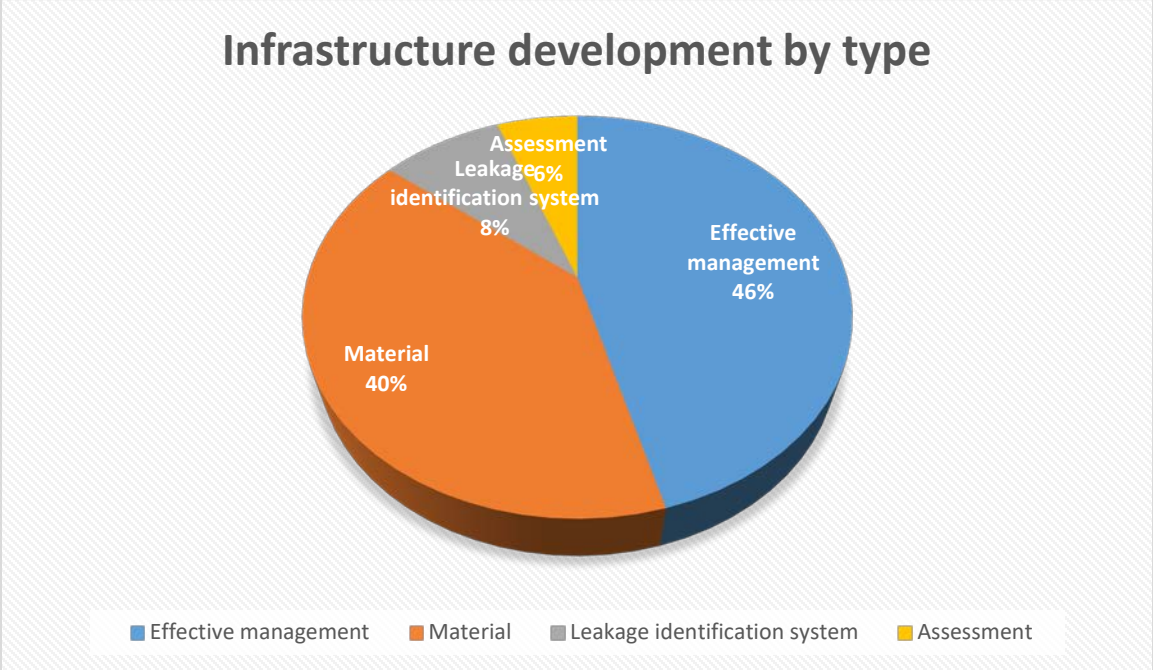
8.3.1 Water supply and sanitation

Water supply infrastructure development refers to a) material solutions, such as extending the water supply network, b) efficiency improvements, such as implementing options for managing demand,

reallocating water among users to reduce projected gaps and meeting future needs, c) integration of leakages' identification systems, and d) implementation of water efficiency assessment systems.

CASTWATER comparative policy analysis results show that **all CASTWATER partners have ongoing infrastructure development plans**. The following graph presents the frequency of the implementation of each of the four aforementioned infrastructure development initiatives applied in European Union CASTWATER territories:

Figure 18: Infrastructure development (type)



Additional breakdown of results by type of infrastructure development shows that the promotion of effective management tools and material improvements feature most prominently than other. For example, effective management practices in infrastructure development have been advanced in Emilia Romagna region, Italy, where several management measures have been taken, such as compliance with the Minimum Vital Outflow for off-takes from surface water, saving and streamlining actions of surface and ground water abstractions, regulation of abstractions, adoption of devices reducing water consumption, to name a few. Water Board Lemesos has also adopted effective management practices for water management, such as increasing storage capacities for keeping water supply uninterrupted and managing water distribution based on the water volume collected in dams and lakes.

In some cases, such as the Spanish regions of Murcia and Valencia, there are innovative infrastructure development under way. The Spanish legislation foresees the existence of a national water bank as well

as regional water banks. These banks are known as "exchange centres" for water rights, where grantees and rights holders can participate as long as they are registered in a national Water Registry. Equally, a public offer for the acquisition of water rights is regulated through a contest-like approach in which the applicant, who properly justifies the need for water to be served, is wins the rights to use the water.

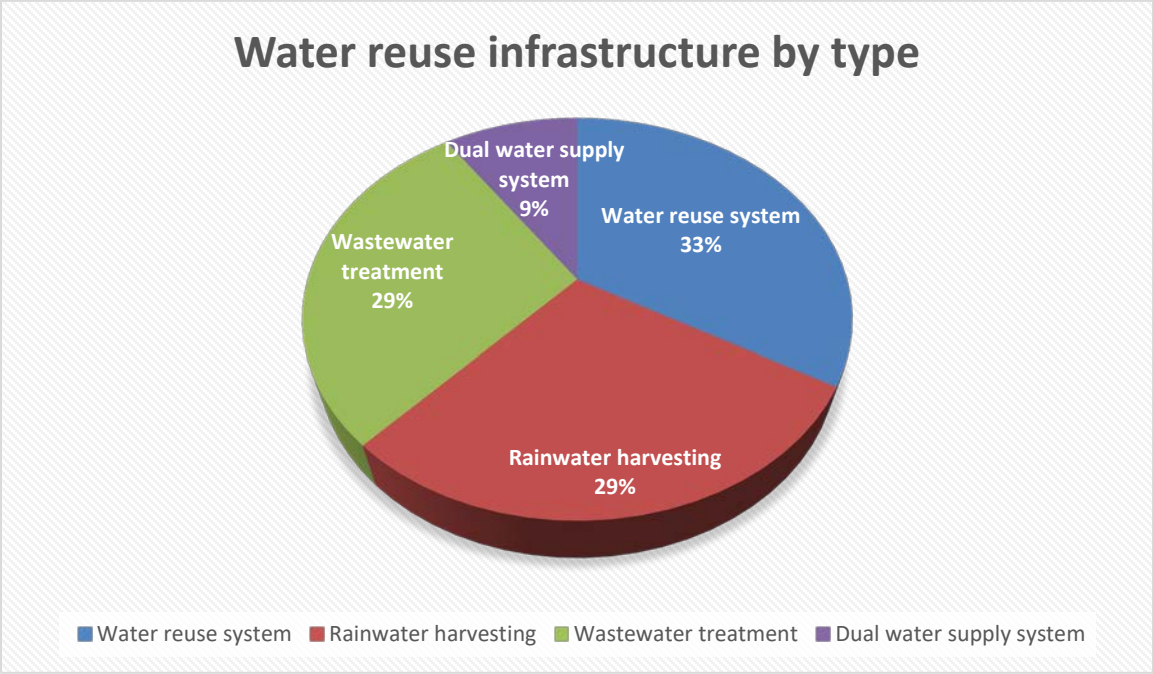
Material infrastructure developments also contribute significantly in infrastructure development. For example, considerable infrastructure plans are underway concerning water management in Crete, targeting especially tourism and remote areas. The Operational Programme "Transport Infrastructure, Environment and Sustainable Development" 2016-2020 has already completed over 350 water resource protection and management works around Greece since 2007. In the region of Crete, supported projects refer to integration of urban wastewater collection and treatment infrastructures, focusing on the extension and modernization of urban collection and treatment waste water systems as well as on the amelioration of water supply infrastructure. The Water Supply Services of Rethymno has also announced water management, water quality assurance, and leakage identification projects with over 1m budget.

Results show that water infrastructure development is highly important, since all CASTWATER partners have made considerable investments in water infrastructure. However, none of the plans are directly targeted to tourism water management. Instead, most developments pertain to the infrastructure network in general, aiming the upgrading of existing water supply and sanitation infrastructure, and introduce various technological tools (e.g. smart leakage identification systems) that assist the effective management of the water system. As a result, **only 1 out of 11 partners have reported infrastructure developments for specifically addressing tourism water management**. Water Board Lemesos, Cyprus, has promoted infrastructure development as a policy instrument to hotel owners. This action facilitates the reduction of water consumption through automated showers, double flash toilets and the re-use of the towels to reduce laundry usage.

8.3.2 Water reuse infrastructure

A key type of infrastructure development initiative with immense potential to improve water sustainability in tourism is infrastructure promoting water reuse. Water reuse mechanisms and facilities are central for an integrated water resource management, involving multiple benefits for development and sustainability. Such policies effectively promote the value of the ecosystem, benefiting communities to improve ecosystem management and human well-being. Water reuse infrastructure can significantly improve water availability as well as tourist services, especially in MED areas with high pressures on water demand from tourist activities. The following figure presents the frequency of use of water reuse infrastructures in CASTWATER territories:

Figure 19: Water reuse infrastructure (type)



To present some examples of such water reuse infrastructures, the Departmental Council of Herault, France, has reported a series of measures regarding pool water reuse (substitution of pool water by raw water or seawater than potable water, reuse of filtered water, reuse of pool water for sanitary purposes). Additionally, it has been proposed to extend the use of recycled pool water for watering green spaces and cleaning the pavements. Furthermore, Water Board Lemesos, Cyprus, has developed a series of different water reuse infrastructure. WBL is responsible for the maintenance of regional dams, and more recently the creation of artificial lakes for the collection and the preservation of rain water. With WBL's recommendations, a policy was enforced so as drinking water is not used for irrigation of gardens and parks in the touristic areas, with either treated water or non-drinking water utilised.

However, as the analysis of results indicates, water reuse infrastructure fails to specifically address tourist activities. As results indicate, only **1 out 11 partners reported water use infrastructure developed specifically for tourist activities**. WBL has developed a secondary network in the coastline of Cyprus for transferring grey water to a treating facility outside the city, and then transfer the treated water to touristic units for irrigation. Reduced tariffs for this water, provide incentives to the stakeholders to utilize this service.

8.4 Incentives and public awareness

The third type of proactive policy intervention is the formation of incentivisation and awareness raising mechanisms. The need to foster responsible water management in the tourism sector has led to the

development of several schemes in CASTWATER partners to stimulate investment, and increase the participation in education and training programmes. The latter are usually intended by public authorities to encourage particular types of behaviour (responsible water management, in this case) and/or to favour concrete groups (certain individuals or companies). It is important to bear in mind that incentives are an alternative to direct institutional policy making for the sake of obtaining given economic and social objectives. Data results show that **all partners have incentives as well as public awareness campaigns in place**.

Investment in the management of water resources through education and training is widely recognised as one of the key engines for sustainable growth and social cohesion. The implementation of relevant water policies requires both incentives to customers and businesses, as well as public awareness schemes for the general public. These actions harmonise uneven policy implementation and tackle barriers that hinder the adoption of sustainable water management.

8.4.1 Financial Incentives

Financial incentives can be grouped into two distinct categories:

- **Incentives to water users:**

These action target the individual water users. A noticeable example comes from the Departmental Council of Herault, France, which has reported the measure of seasonal price fixing for domestic use. Among the techniques enabling the realisation of water savings, incentive pricing policies have been put in place through a dual pricing scheme of "summer/ winter" drinking water. The principle is to charge more for water consumed during summer months. The introduction of such financial incentives aims to distribute the increased cost of water and water infrastructure, thereby alleviating the seasonality of the financial burden for the local population. Such a measure strikes a better balance of expenditures between the permanent seasonal population and seasonal visitors.

Three communities have implemented this type of policy in the departmental territory of Herault since 2008. The difference between winter and summer price varies between 15 and 31%. This difference varies according to years and according to municipalities. However, mixed results emphasize that the same tariff policy may have very different impacts depending on the municipalities. These data show that communication and awareness among citizens around the implementation of dual pricing are complementary elements essential for a significant and sustainable reduction in consumption.

Another example of financial incentives to customers was reported by the Municipality of Rethymno, Greece. New national pricing regulations dictate an environmental fee in contributory nature, i.e. it will finance water saving and water management projects. Water is recognised as a natural resource to be protected. To this end, citizens who practice rational water management practices will not be burdened with environmental charges. Also, vulnerable social groups as defined in Article 1, paragraph 4 of Law 4019/2011 will be protected. Pricing policy ensures adequate cost recovery, as well as long-term

sustainability of water and sanitation networks. The focal aim is to reduce costs without increasing the price of water. However, in cases where this is not possible, periodic increases in average water service charges, which may not exceed the GDP growth rate of the previous year, are allowed. With regard to agricultural water, it is also taken into account that water is a natural resource and a basic tool of the primary sector, which is recognized as the main pillar of development for the country. Farmers who apply good irrigation practices will not be charged with environmental fees, while environmental taxes will exclude the weakest economies. In the field of water for rural use emphasis is placed on the reduction of costs, formulating the pricing policies in the direction of sustainable irrigation services.

- **Incentives to businesses:**

Creating incentives for businesses in the tourism sector can greatly complement national/regional water management policies. For example, both Municipality of Rethymno, as well as Malta Regional Development and Dialogue Foundation reported eco-labelling schemes that include water conservation measures in their core principles.

MTA ECO certification scheme is a programme introduced in 2002 (revised in 2012) by the Malta Tourism Authority, to eco-certify local hotels. It is a national scheme for ensuring the environmental, socioeconomic, and cultural sustainability of hotels on the Maltese Islands (recognised by the Global Sustainable Tourism Council as fully reflecting the GSTC criteria). To achieve certification, hotels have to achieve/meet 65% from the 130 established criteria to become an eco-certified establishment. One of the three core principles of the scheme is the reduction of water use by 15-45%.

Greece has implemented on a national level the “Green Key Award”, an eco-label for tourism promoted by the Hellenic Society for the Protection of Nature. Green Key is targeted to tourism facilities that meet certain ecological requirements and, in return, get the right to use the eco-label to market their business. All forms of hotel units, restaurants and leisure facilities are part of the network, but other areas of tourist interest will be also included in the future. As a certification programme, Green Key aims to raise awareness among owners, staff, customers and the local community about environmental and sustainable development issues. The criteria for awarding a Green Key label are divided into 13 categories (Environmental management, Employee Involvement, Customer information, Water management, Washing and cleaning, Waste management, Energy, Food and beverages, Interior environment, Parking spaces, Corporate social responsibility, Green activities, Administration).

8.4.2 Incentives to participate in public awareness and education programmes

All regions have run water conservation campaigns and have organised info days in their attempt to raise public awareness. An exemplary case of raising public awareness was reported in Cyprus by the Water Board Lemesos partner. Since 2008, the WBL maintains a water museum in its premises and invites organised groups and the public to visit. Schools visit the museum in a daily basis and thousands of students have been exposed to the importance of production, conservation, and best usage of water to ensure the future water sustainability. Additionally, WBL uses campaign intensification techniques, in

order to accelerate water conservation campaigns during periods of reduced water supplies, communicating with posters, leaflets, information brochures enclosed with bills, stickers for the public spaces, and information emails.

Another exemplary case is the "Water for All" campaign, developed by the region of Murcia, Spain. This informative action has lasted more than 10 years and was internationally recognized with the GWA (Golden World Awards) of the International Association of Public Relations and Advertising (Berlin). This campaign achieved a wide awareness of the society of Murcia and generated very important social mobilizations in such a way that national surveys have shown that at present the populations of Murcia and Valencian Community are the most aware about the responsible use of water in Spain.

8.5 Index of key existing policies

The following table presents the key existing policy frameworks for the support of sustainable water management in the tourism sector applicable to the partnership countries:

Table 4: Key existing policies in CASTWATER Mediterreanean territories

Municipality of Rethymno	
National level:	Regional level:
1. Special Spatial Development Framework for Tourism 2. "Green Tourism" programme 3. New Building Regulation 4. Pricing mechanisms 5. Green Key eco-label	1. River Basin Management Plan of Crete
Region of Emilia Romagna	
Regional level:	
1. Water Protection Plan – Emilia Romagna region	
Veneto Region	
Regional level:	
1. New rules for land reclamation and protection 2. Initiatives for the protection of water courses spring 3. Water Protection Plan – Veneto region 4. Provisions on water resources 5. Qualitative classification of internal regional surface waters: watercourses and lakes	

6. Support for the renewal and securing of the sewage system in the Garda area 7. Financing of activities to raise awareness on water saving and conscious water consumption 8. Sensitization to water saving and awareness of water consumption: funding for the Veneto Environment Reclamation Union for the Environment Week	
Water Board Lemesos - Cyprus	
National level:	
1. Single management plan 2. Alternative dispute resolution mechanism 4. Rainwater harvesting and water reuse 5. Infrastructure Development 6. Water trading and water quality trading 7. Pricing mechanisms	
University of Patras – Western Greece	
National level:	**Regional level:**
1. Floods directive 2. Pricing mechanisms	1. River Basin Management Plan of Western Peloponnese
Euromediterranean Water Institute Foundation (F-IEA) - Murcia	
National level:	**Regional level:**
1. National Hydrological Plan 2. Circular Economy Strategy 3. Automatic Hydrological Information System 4. Drought Law 5. Payment for Ecosystem Service 6. Water Savings Act	1. Segura River Basin Management Plan
Institute of Agriculture and Tourism (IPTPO) - Croatia	
National level:	
1. Water Act 2. Water Management Financing Act	
Las Naves - Foundation of the Valentian Community to promote strategic urban development and innovation - Valencia	
National level:	**Regional level:**
1. National Hydrological Plan 2. Circular Economy Strategy 3. Automatic Hydrological Information System 4. Drought Law 5. Payment for Ecosystem Service 6. Water Savings Act	1. Júcar River Basin Management Plan
Departmental Council of Herault (CD34)	

National level:	Regional level:
1. Pool water reuse framework 2. Distant metering scheme	1. Seasonal tarification
Malta Regional Development and Dialogue Foundation (MRDDF)	
National level:	
1. 2nd Water Catchment Management Plan for the Malta Water Catchment District 2015 – 2021 2. Tourism Policy for the Maltese Islands 2015-2020 3. MTA ECO certification scheme 4. Grant Scheme for Sustainable Development in Tourism by Enterprises 5. Blue Flag Programme 6. BOV JAIME (Joint Assistance Initiative for Maltese Enterprises) Financing Package	
Energy and Water Agency (SEWCU) - Malta	
National level:	
1. 2nd River Basin Management Plan for Malta	

8.6 Key policy recommendations

The following recommendations can be used both by public authorities in the tourism sector to ameliorate water management in this sector in their territories. The recommendations are structured according to the four main policy areas that guided the coding of data and the grouping of results: a) integrated planning, b) infrastructure development, and c) incentives and public awareness, and are summarised in the following table:

Table 5 Summary of policy recommendations

Integrated planning recommendations
• ***Create a comprehensive water management policy which addresses and regulates water management in tourist activities.*** • ***Integrate and harmonise water management policies existing dispersed among various environmental, tourism, energy or other policy frameworks.*** • ***Strengthen existing water management policies in tourism areas by specifically addressing water conservation in the tourism sector.*** • ***Develop a common vision for both sustainable tourism and sustainable management of water resources.*** • ***Promote cross-sectoral tourism water management approaches in a mixed urban scenario.*** • ***Promote innovative intersectoral approaches to water management addressing recent trends in the tourism sector.***

• ***Comprehensive and cross-sectoral approaches to water management should be developed side by side and be equally promoted.*** • ***Integrate financial recovery of measures and fiscal viability as a prerequisite in the policy framework, to sustainably develop water conservation in tourism.*** • ***Address institutional problems through clear definition of responsibilities for efficiently tackling water management in tourist activities.*** • ***Establish a regional management plan for water management in the tourism sector, targeting especially areas with high volume of tourist activity.*** • ***Create a regional data collection system for monitoring tourist activities' water demand.*** • ***Promote the incorporation of water conservation indicators and sustainable water management in national/regional eco-labelling schemes.*** • ***Promote agreements between tourist facilities and public authorities for sustainable water management.***
Infrastructure development recommendations
• ***Introduce water reuse infrastructure in tourist facilities.*** • ***Create alternative water systems for tourism infrastructures.*** • ***Promote innovative solutions in water infrastructure by involving R&D stakeholders.*** • ***Innovate on water reserve management by creating a water reserve network.*** • ***Modernise water infrastructure in tourism facilities.***
Incentives and public awareness recommendations
• ***Develop layered pricing mechanisms encouraging water conservation in the tourism sector.*** • ***Promote good practice guides through tourism associations.*** • ***Finance water conservation projects in tourist facilities.*** • ***Strengthen awareness campaigns for citizens and tourists alike.*** • ***Promote better water management of public spaces to public authorities.*** • ***Introduction of training facilities, training sessions, and education around water use and re-use.*** • ***Provide incentives to tourist facilities employees to be trained in water conservation methods.***

All recommendations in the table above are presented in detail in the following section.

8.6.1 Integrated planning recommendations

- *Create a comprehensive water management policy which addresses and regulates water management in tourist activities*.

Water must be managed in an integrated manner through a multidisciplinary approach targeting the whole life-cycle of the tourism value chain in CASTWATER regions. From public attractions to hotels and water parks, recognising that the implementation of a comprehensive water management policy for the tourism sector will require an integrated open-ended process engaging governments at all levels, international organizations, businesses, NGOs and consumers is of paramount importance.

- *Integrate and harmonise water management policies existing dispersed among various environmental, tourism, energy or other policy frameworks*.

  There is a need to integrate sustainable tourism planning into national and regional development water management plans in order to strengthen action on the ground and build the skills and resources needed to apply them effectively. Public policies, governance mechanisms and stakeholders' involvement should be jointly developed into a common framework outlined in the national and regional development plans.

- *Strengthen existing water management policies in tourism areas by specifically addressing water conservation in the tourism sector*.

  Institutional frameworks need to be improved so that there would be horizontal and vertical coordination at local, national, and regional levels. Problems usually encountered such as fragmented and overlapping responsibilities among agencies involved in water projects and a general shortage of institutional capacity to meet the increasing needs in service delivery and resource management could be tackled by strengthening institutional frameworks and separate policy, planning, and regulatory functions from operational functions at each level of government.

- *Develop a common vision for both sustainable tourism and sustainable management of water resources*.

  In order for all forms of tourism to become more sustainable within a reasonable water resource use, a common vision pertaining to both is needed. This includes joint governance of issues, rethinking the existing infrastructure at destinations, especially with the assistance of relevant public and private tourist operators, identifying innovative modes of travel, and strengthening the development of various 'niche' tourism segments (e.g. ecotourism, community or rural tourism, heritage or cultural tourism) to become a more significant share of the market and a major form of tourism for some countries.

- *Promote cross-sectoral tourism water management approaches in a mixed urban scenario*.

  As a resource which impacts on a number of sectors (agriculture, industry, health, tourism, environment etc.), water is different from other issues such as education or health in that it is rarely the responsibility of just one minister of a national government. Careful consideration must be given to the water cycle in a mixed urban scenario. The renewal of freshwater supplies requires taking into account the existence of cross-sectoral needs. Tackling varying interests from several actors, as well as diverging needs from different sectors, demands cross-cutting sectoral water management policies.

- *Promote innovative intersectoral approaches to water management addressing recent trends in the tourism sector*.

  The emergence of disruptive business models and the rise of peer to peer rental platforms (e.g. Airbnb) has substantially affected the tourism industry, necessitating water management policies that go beyond water conservation in the tourism sector. These impacts require the development of new policies that are able to address the changing landscape of tourism, requiring strategic intersectoral strategic approaches.

- *Comprehensive and cross-sectoral approaches to water management should be developed side by side and be equally promoted*.

  The many, and sometimes conflicting, uses of such a unique natural resource as water creates multiple policy difficulties for public authorities. Consequently, the broad range of stakeholders (public bodies – both at central and decentralised levels – users, private sector, civil society) adds more complexity to the sustainable management of water. For this reason, approaches that target specifically water management in the tourism sector as well as on a cross-sectoral basis should be considered, recognising the benefits of that result from combining two different policy directions.

- *Integrate financial recovery of measures and fiscal viability as a prerequisite in the policy framework, to sustainably develop water conservation in tourism*.

  Adopt the appropriate financial measures to ensure that water management systems in tourist facilities are built and operated in a cost-efficient manner; take into consideration the topography and future population needs; and allow for resource recovery, energy and water efficiency and reuse to conserve water.

- *Address institutional problems through clear definition of responsibilities for efficiently tackling water management in tourist activities*.

  Clearly allocate and distinguish roles and responsibilities for water policymaking, policy implementation, operational management and regulation, and foster coordination across these responsible authorities.

- *Establish a regional management plan for water management in the tourism sector, targeting especially areas with high volume of tourist activity*.

  The systematic application of sustainability objectives and criteria to new and existing tourism products and services should be encouraged. Water management plans for the tourism sector should be long-term, fostering conjunctive management of tourism water demand, and be regularly reviewed and updated. They would benefit from stakeholder consultation. Develop measures specifically addressing water management in tourism, to be incorporated in the next phase of River Basin Management Plans' Programme of Measures. Implementation of integrated water resources management at the river basin level is needed.

- *Create a regional data collection system for monitoring tourist activities' water demand*.

Planners should identify and utilize legal and fiscal regimes, information, knowledge, evaluation tools, and cooperative processes among professionals and civil society. Public and private institutions and organizations engaged in tourism and water management planning, should develop credible scientific methods and tools encompassing economic, environmental and social approaches and assessments for sustainable development that will help stakeholders relate to different components of the value chain understand their environmental and socio-cultural impacts.

- *Promote the incorporation of water conservation indicators and sustainable water management in national/regional eco-labelling schemes*.

  Eco-certification of tourism establishments promotes water conservation measures. Promotion of eco-labelling in more tourist facilities could assist the tourism industry to innovate its products and services and increase their quality and value. Supporting environmental interventions such as the introduction of waste separation bins, the installation of room energy management systems is crucial for minimising water consumption.

- *Promote agreements between tourist facilities and public authorities for sustainable water management*.

  Public authorities could forward tourism stakeholder agreements among regional authorities and tourist organisations and facilities for water resource management. Empirical researches conducted in tourist facilities in MED areas showed a high motivation for hotel owners to manage water consumption more effectively.

8.6.2 Infrastructure development recommendations

- *Introduce water reuse infrastructure in tourist facilities*.

  Preventing and managing the impact of tourism on natural and cultural resources, water reuse initiatives for tourist facilities could significantly ameliorate water management in the tourism sector. Reusing grey water through onsite treatment or pool water for irrigation water could significantly limit water consumption.

- *Create alternative water systems for tourism infrastructures*.

  Seasonal water consumption, with the peaks happening during times when resources are at their lowest and receive high pressure from irrigation, can create water shortages that affect tourism quality in CASTWATER regions. Installing alternative systems of water management in tourism facilities, such as wastewater or pool water treatment, the tourism sector can both reduce expenditures and also contribute to the sustainability of water resources.

- *Promote innovative solutions in water infrastructure by involving R&D stakeholders*.

  Tourism stakeholders alongside public authorities and local communities could significantly improve water management in high volume tourist regions by implementing innovative solutions in water infrastructure. R&D projects regarding the tourism sector could produce innovative water

optimisation tools for advancing sustainable water management in tourist facilities. Innovations may include Integrated Monitoring and Modeling System, Intelligent Water Distribution Systems, modular membrane systems, bipolar membranes for bipolar electro dialysis (BPMED). Usage of nanotechnology is also an area that can be included in sustainable water management policies.

- *Innovate on water reserve management by creating a water reserve network*.
  Seasonality puts a lot of pressure on available water resources. Water reserve initiatives, such as building water banks and reservoirs could substantially improve the quantity of available water during seasonal pressures from tourism. Rainwater harvesting cisterns could be linked with a central reserve system that collects and stores water from alternative sources.

- *Modernise water infrastructure in tourism facilities*.
  MED urban water infrastructure is often outdated and in constant need of replacement. Leaks and repairs are wasteful, inefficient, and costly. Additionally, rapid urbanisation and seasonal tourism means that drainage infrastructure cannot keep up with the increase in build-up of impermeable surfaces. Improvements in water supply and wastewater infrastructure will create a more efficient water network.

8.6.3 Incentives and public awareness recommendations

- *Develop layered pricing mechanisms encouraging water conservation in the tourism sector*.
  The sustainability and quality of water resources relies on community retention of public water services. Public water supplies and services are contingent upon high quality standards, affordable and reliable infrastructure systems, appropriate pricing, and the management of supply and demand on a sustainable basis. For this reason, developing layered pricing mechanisms directly connected with the sustainability of water resources can prove an effective tool for shifting tourist practices. For example, the introduction of environmental penalties, seasonal and/or inverted block rates are some of the relevant measures that could incentivise the tourism sector.

- *Promote good practice guides through tourism associations*.
  Managing environmental issues in the tourism sector requires guidelines on the optimisation, management and control of existing water resources and systems. Providing concise advice on good practices concerning the optimal management of water in tourist facilities could be achieved by providing targets, both numerical and observational, for the various activities that should be undertaken to conserve water.

- *Finance water conservation projects in tourist facilities*.

8.7 Key learning points

- There is an obvious lack of a comprehensive regulatory framework for tourism water management framework in European Union Mediterranean regions. The relevant policies exist dispersed among the WFD national/regional implementation, the complementary national/regional regulations, and the water monitoring framework.
- Mediterranean EU territories have measures targeting tourism water management, albeit through other objectives (circular economy, energy-saving, "greening" economy). For example, all partners described at least one complementary measure of national/regional importance relating to tourism water management.
- Although there are considerable differences among regions, there is a common pattern emerging concerning the implementation difficulties encountered in sustainable water resource management: most prevailing problems encountered in the process of implementing water management policies are of financial, administrative, and monitoring nature.
- Results show that cooperation improvement through stakeholder participation ranges from adequate to high in most European Union Mediterranean regions. However, the participation of tourism-related stakeholders can be improved in order to specifically address the types of difficulties listed above.
- Data analysis shows that infrastructure development holds a prominent place in European Union Mediterranean regions' water management policies. It is noticeable that, for example, all CASTWATER partners have large infrastructure plans undergoing, covering all aspects of water infrastructure: water supply and sanitation networks, complementary technological devices, as well as water treatment and reuse systems. However, tourist activities are not taken into account in the development of water infrastructure plans. As a result, there is a lack of infrastructure planning designed for particularly addressing water conservation in the tourism sector.
- All European Union Mediterranean regions make use of incentives and public awareness tools for promoting responsible water management to both customers and businesses. The pressure of seasonal tourism during summer months requires to strengthen existing as well as develop new measures for micro-targeting particularly tourism facilities and visitors.

9 Module 6: How to use and analyse the results of the CASTWATER online monitoring tool

Self-learning targets:

1. ***Learning the key functionalities of the CASTWATER online tool.***
2. ***Understanding how to interpret the values of the indicators embedded in the CASWATER online tool.***

The previous sections provide the necessary knowledge for understanding the process of adopting water sustainability solutions in the tourism sector of the Mediterranena. However, what is missing from this effort is understanding the perspectives of tourism businesses. After all stakeholder opinions and views can prove to be the crucial factor that determines whether a policy is successful or not. To allow for an assessment of the perspectives of tourism businesses and SMEs in the Mediterranean, the CASTWATER partnership has made available an online tool, exclusively addressed to tourism sector SMEs in Mediterranean, that allows them to understand, compare (with other SMEs), assess and rate their performance on water efficiency & water management. On their turn, public authorities can analyse the results of SMEs' self-assessment to fine-tune their policies using this input. In addition, the CASTWATER online tool offers tourism SMEs the opportunity to evaluate the policy measures and the condition of water sustainability in general in their territory. By examining their answers, public authorities can receive direct input for their policies and the territorial conditions where they are applied, directly from tourism SMEs.

All in all, tourism SMEs (i.e. end users) will be invited to provide business related information regarding their investments, measures and actions to promote water efficiency in their establishments, as well as their perceptions on the effectiveness and adequacy of the existing policy framework for water resources in their region. The data to be gathered by tourism SMEs' replies will optimise the efforts of public authorities to monitor tourism sector's overall performance in their region and to measure the effectiveness of territorial policies on water management. To sum up, the online tool will be utilised by public authorities for the following reasons:

1. Enable public authorities to understand the management of water resources by tourism SMEs, as described by the latter. The self-evaluations of tourism SMEs with regards to their performance in sustainable water management are a useful source of data for developing measures that promote water efficiency in tourism their establishment and are adapted to the perspectives, views and behaviour of tourism SMEs.

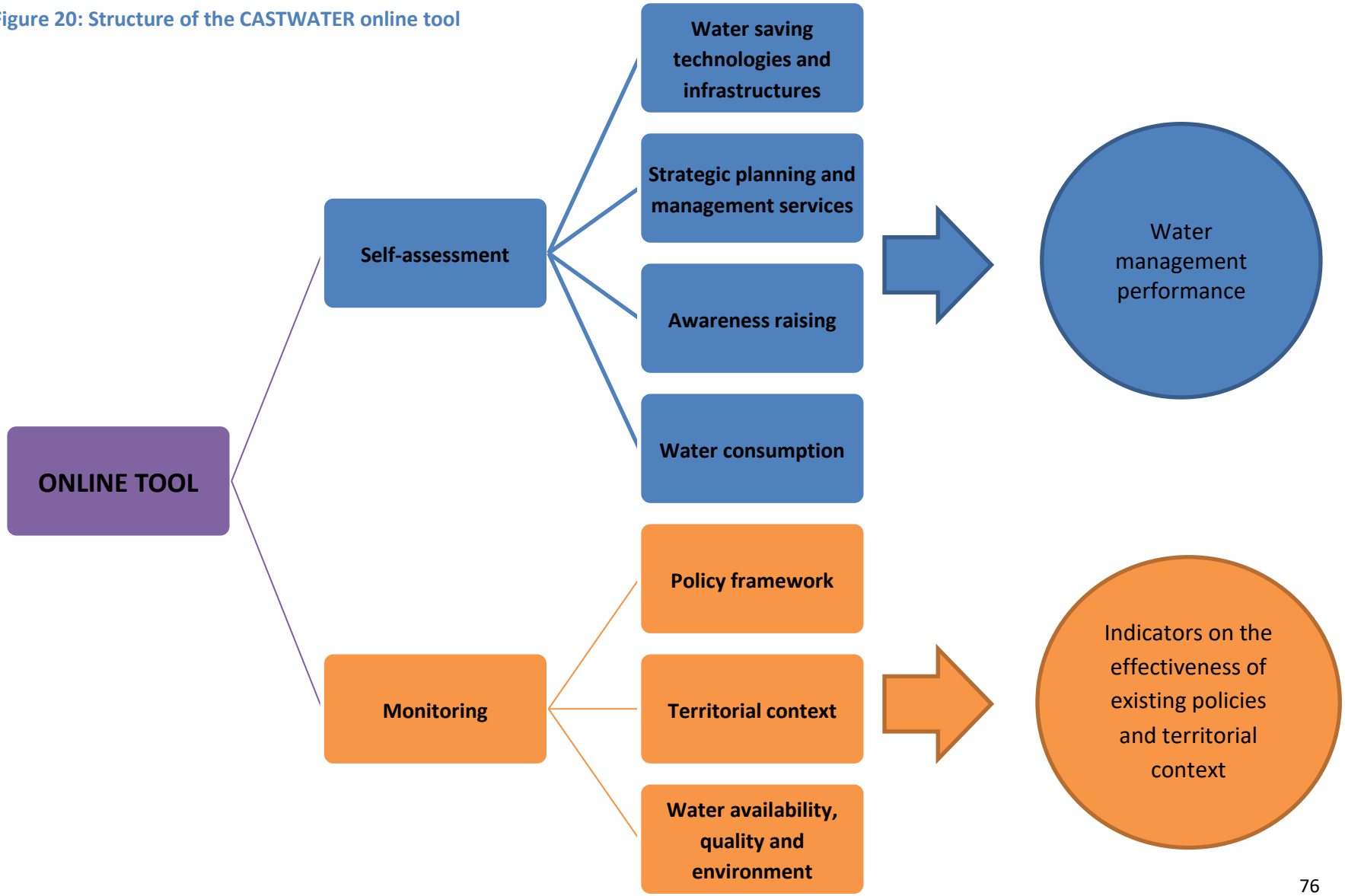
2. Enable public authorities to understand how tourism SMEs evaluate policies developed and implemented by public authorities in the entire territory. This understanding can then be used to improve their governance and the effectiveness of water-tourism policies to improve sustainable water management, especially at regional and local level.

Correspondingly, to achieve these targets, the CASTWATER online tool is based on a system of questions that help estimate the value of two different types of indicators; one intended for tourism SMEs' self-assessment and one for the evaluation of public authorities' policies by tourism SMEs. This allows measuring the degree of both tourism SMEs and public authorities' compliance with the principles of sustainable water management. To motivate massive participation and minimise the risk for a high dropout rate, the tool requires information (i.e. replies) that is already available in the company or easy to find. To complete the questionnaire, users (i.e. tourism SMEs' members) need not carry out any type of research or consultation process (which would bear the risk to abandon the questionnaire before completion); even in the "monitoring" section (addressing policy issues) users declare their own views and opinions.

On the one side, the values of indicators intended for tourism SMEs' self-assessment are automatically displayed in the online tool, enabling thus the grading of SMEs' performance in promoting water efficiency, while on the other side, the indicators intended for the evaluation of public authorities' policies can be made available upon request during the analysis stage (as aggregate statistics) to help them derive useful conclusions about sector's overall performance and the surrounding environment (e.g. policy framework, territorial context) affecting the adoption of water efficiency measures.

As already mentioned, the CASTWATER online tool will consist of two sections: a) self-assessment (indicators for SMEs), and b) monitoring (indicators for Public Authorities). Figure 14 displays the structure of the online course as found in the deliverable of CASTWATER activity A3.7 (D3.7.1-"Specifications for the CASTWATER online tool"). The next paragraphs present in detail the indicators that can be estimated by the tool and their meaning, as described in deliverables D3.6.1 ("Indicators List for the Evaluation of Tourism Water Management Efforts in Partnership Area") ") and D3.7.1.

Figure 20: Structure of the CASTWATER online tool



9.1 Self-assessment areas: Water saving technologies and fixtures indicators

The first indicator category included in the online tool is the one addressing the adoption on behalf of SMEs of water saving technologies and fixtures. As seen in previous chapters, sustainable water management and water efficiency in general in tourism SMEs is closely linked to the adoption of water saving technologies & infrastructures, which are designed to affect both water demand and supply by minimising water consumption and increasing water availability respectively. To provide an example of water saving fixture, the installation of fixtures such as e.g. aerators on taps, flow control and timer mechanisms in guest rooms will (directly) decrease water consumption, without requiring any additional effort from guests (e.g. behavioural change). Moreover, smart control systems and environmental sensors (i.e. water efficient irrigation technologies) applied in green areas, optimise the operation of the irrigation system (based on environmental conditions and particularly soil moisture), thereby promoting water conservation. The same principle applies to water recycling technologies, which constitute an excellent way to conserve water by offering tourism SMEs with additional water resources in situations where it's difficult to satisfy the demand through public utilities. For example, the deployment of a sewage treatment plant can help treat wastewater/effluent in a way that it can be used for non-potable purposes. The following table summarises the indicators of this category used in the CASTWATER online tool.

Table 6: Water saving technologies and fixtures indicators

Code	Indicator	Indicator description	Measurement unit
S1	Annual budget for investments in sustainable water management	This indicator will measure the total amount of money (expressed as percentage of annual budget) invested by tourism establishments in water efficiency measures	Comparison between a) annual budget used for investments in sustainable water technologies & fixtures, and b) total annual budget
S2	Adoption of water saving devices and fixtures	This indicator will measure tourism SMEs' investment in water saving devices and fixtures, seeking to decrease water consumption in a passive way.	Score depending on how many different types of water management devices and/or fixtures the tourism SME has applied to improve water efficiency.
S3	Installation of water recycling systems	This indicator will evaluate the measures adopted by tourism SMEs to increase water availability (i.e. supply).	Score depending on how many different types of non-conventional water resources/water recycling technologies the tourism SME has utilised to improve water efficiency.

Code	Indicator	Indicator description	Measurement unit
S4	Deployment of water efficient irrigation technologies	This indicator will measure the diffusion levels of various smart irrigation technologies among tourism SMEs, as a means to optimise water usage for gardening purposes.	Score depending on how many different types of efficient water irrigation technologies have already been applied by the tourism SME

By examining and analysing the answers provided by tourism SMEs to questions corresponding to the indicators above, public authorities can receive information about the real rate of adoption of water saving technologies and fixtures by tourism SMEs. The answers can be described as an indicative sample of the diffusion of technological innovations akin to water efficiency in tourism in Mediterranean territories. This information can then be used to improve measures developed to support the proliferation of such technologies and fixtures..

9.2 Self-assessment areas: Strategic planning and management services indicators

The next self-assessment area- indicator category included in the CASTWATER online tool aims to address the proliferation of strategic planning and management processes aiming to improve water management in tourism SMEs. Strategic planning and management are key dimensions of a successful water conservation programme in all industries, including tourism. The achievement of water reduction targets depends on the following issues that this category indicators addresses:

- Finding out if there is a comprehensive plan aimed at understanding the water use profile of each tourism SME, and at facilitating the adoption of targeted measures to minimise water consumption, and the characteristics of this plan.
- Finding out the water management processes applied by tourism SMEs to continuously monitor water consumption or/and regularly inspect plumbing infrastructures for leakages or malfunctions.

The following table summarises the indicators of this category used in the CASTWATER online tool:

Table 7: Strategic planning and management services indicators

Code	Indicator	Indicator description	Measurement unit
S5	Implementing environmental management systems (EMS)	This indicator will reveal whether tourism SMEs apply environmental management systems to	Positive or negative assessment depending on whether or not the tourism SME has applied

Code	Indicator	Indicator description	Measurement unit
		achieve their sustainability goals.	a specific environmental management system
S6	Fostering strategic planning for sustainable water management	This indicator will evaluate tourism SMEs' strategic planning to promote sustainable water management.	Score depending on how many different actions the tourism SME has already taken to improve its water management planning
S7	Performing water management services	This indicator will evaluate tourism SMEs' course of actions to further promote sustainable water management.	Score depending on how many different water management services have already been applied by the tourism SME
S8	Monitoring water consumption	This indicator will assess the number of methods employed by tourism SMEs for monitoring water consumption across all business facilities.	Score depending on how many different monitoring water consumption methods have already been applied by the tourism SME and compilation of these data from all respondent SMEs

Using an analogous rationale to the one used for the first self-assessment area, the indicators of self-assessment area are designed to reveal various qualitative aspects of tourism SMEs, but this time focusing on their institutional strategy and management of water efficiency. Public authorities can use this input to find ways to promote efficient management of the use of water resources by tourism SMEs in their territory. Since efficient water management does not necessarily appear in the SMEs' financial statistics, the online tool utilises the indicators of this self-assessment area to find information about whether or not tourism SMEs have taken a number of measures and actions that ensure efficient planning, management and monitoring of their performance with regards to the efficient use of water resources (e.g. whether they have already installed regular inspection routines to detect leaks, they have developed and established water reduction targets, and they have applied specialised monitoring technologies). Tourism SMEs are rated depending on how many components of efficient planning, management and monitoring of the use of water resources they have applied. Furthermore, the indicators of this category can be used to to reveal if tourism SMEs have adopted and are certified to apply specific environmental management systems (e.g. ISO 1400). By answering such questions, tourism SME personnel that assess themselves will

immediately get an idea of the wide spectrum of actions they can take to improve the management of water uses within their firms.

9.3 Self-assessment areas: Awareness raising indicators

The third self assessment area includes indicators designed to inform about the extent to which tourism SMEs train their personnel and engage with their customers to improve water sustainability. After all, water conservation strategies and application of efficient water management, would be void concepts without the participation of both employees and tourists. Public authorities will benefit from the SMEs' input by being able to develop appropriate awareness raising campaigns and incentives to induce the adoption of training and awareness raising processes by tourism SMEs. Applied training procedures for tourism SME' staff about how to perform water management procedures (e.g. apply pool covers to minimise evaporation or water plants early in the morning) or/and to utilise and maintain equipment for optimum water consumption is a sine qua non of achieving sustainability goals related to water resources. Training can mobilise personnel to adopt sustainable water consumption and use patterns, thereby ensuring their adherence to business water management plan. Moreover, raising tourists' awareness about water scarcity and the tourism SMEs' commitment to promote water sustainability, will increase their willingness to take part in relevant efforts by minimally changing their behaviour (e.g. reuse towels and linens). The following table summarises the indicators of this category used in the CASTWATER online tool:

Table 8: Awareness raising indicators

Code	Indicator	Indicator description	Measurement unit
S9	Training staff	This indicator will evaluate tourism SMEs' efforts to train staff on how to perform sustainable water management processes.	Score depending on how many aspects of efficient training of their employees have been already applied by the tourism SME
S10	Engaging customers on water sustainability	This indicator will measure tourism SMEs' performance in raising customers' environmental awareness and engaging them on sustainable water management practices.	Score depending on how many aspects of efficient awareness raising of tourists have been already applied by the tourism SME and compilation of these data from all respondent SMEs

9.4 Self-assessment areas: Actual water consumption indicators

The final self-assessment area includes indicators designed to help alleviate pressures on water resources, by helping public authorities confront substantial challenges regarding water management, such as the following:

- Increasing number of tourists choosing to visit coastal destinations during their summer vacations. These massive tourist arrivals are expected to increase the demand for water.
- The average tourist's water consumption is much higher than the average per capita residential consumption.
- Existence of huge potential to reduce water consumption in the Mediterranean tourism industry.
- Observed significant variation across the different types of tourism establishments (e.g. hotel, campsites, restaurants, spa centres, and bars) and recreational activities (e.g. yachting, golf, and swimming).

Due to these challenges, it is necessary to ask tourism SMEs to provide figures on their water consumption that will enable to calculate the amount of water required during peak seasons, and hence the extent of pressure placed on water resources. It is evident that a) tourism SMEs should be able to compare themselves with the whole tourism industry of their territory and estimate their progress, aqnd b) public authorities should take into consideration these comparisons whilst developing their policies. The following table summarises the indicators of this category used in the CASTWATER online tool:

Table 9: Actual water consumption indicators

Code	Indicator	Indicator description	Measurement unit
S11	Actual water consumption	The indicator will demonstrate whether user's actual water consumption is above or below the tourism sector's average (at national level).	Comparison between a) water consumption per tourist per day in the SME, and b) domestic/visitor average water consumption (tourist consumption per day corresponds to the consumption of water per visitor nights which are derived from information on international arrivals and average length of stay as provided by Gössling et al. [2000], as quoted by Becken [2014])

Code	Indicator	Indicator description	Measurement unit
S12	Wastewater treatment	The indicator will estimate the relative amount of wastewater receiving treatment	Percentage of wastewater receiving treatment compared to actual water consumption within each SME.

9.5 Monitoring fields: Policy framework indicators

The indicators pertaining to the first monitoring field have been used to develop questions that, if answered by tourism SMEs, will shed light on the quality of water sustainability policies applied within Mediterranean territories. Policies describe sets of actions or measures taken by public authorities to reach pre-determined objectives, such as, in the case of CASTWATER, to promote sustainable tourism water management, by helping overcome problems and barriers and by establishing the framework for private sector initiatives in the field. The implementation of policies does have a significant impact on the intended functions by policy makers, but also on almost all segments of the society, including civil society and private sector (e.g. tourism SMEs). There is a wide spectrum of existing policies related to sustainable water management such as cooperation improvement, joint and integrated planning (based on a participatory approach involving tourism SMEs, civil society and policy makers at all levels), conflict resolution, promotion of services and infrastructures, and incentives provision. The following table summarises the indicators of this category used in the CASTWATER online tool:

Table 10: Policy framework indicators

Code	Indicator	Indicator description	Measurement unit
PA1	Effectiveness of water management policies	This indicator will measure the effectiveness of policies and instruments related to water management in the tourism sector	Average rank depending on the SMEs' opinion about how well have been implemented several types of policy measures for the promotion of water sustainability.
PA2	Frequency of water quality controls	The indicator will measure the frequency of water quality controls, seeking to evaluate the effectiveness of control policies effectuated by public authorities.	Average time interval between water quality controls conducted at the SME level.

The two indicators of this monitoring field were chosen to ensure that public authorities will receive the subjective feedback about how tourism SMEs value their policies and the efficiency of their implementation. Receiving data about the views of tourism SMEs and understanding them is a crucial component of contemporary policy making, since successful policies can only be developed via collaborating with the private sector. The CASTWATER online tool is an excellent way for public authorities to uncover any gaps in the efficiency of their water sustainability policies in tourism by receiving direct feedback from tourism SMEs.

9.6 Monitoring fields: Territorial context indicators

Indicators corresponding to the second monitoring field, are aimed at assessing the territorial capacity for improvements in water sustainability in tourism in the Mediterranean. What that means is that these indicators can be utilised by policy makers to advance further measures on sustainable tourism water management, by developing an understanding of the perspectives and views of SMEs with regards to regional attributes of the issue of water efficiency in tourism. The method to develop this understanding is applying a PESTEL analysis, and understanding the views of tourism SMEs about political, economic, socio-cultural, technological, environmental, and legal factors). Furthermore, public authorities will have the opportunity to examine data about 1) tourists' water consumption compered to the residential water consumption and total water consumption, 2) the infrastructure used by tourism SMEs to treat their wastewater and 3) the degree of integration of sustainable tourism services (e.g. ecotourism) to the tourism packages/itineraries/products offered by tourism SMEs. The following table summarises the indicators of this category used in the CASTWATER online tool:

Table 11: Territorial context indicators

Code	Indicator	Indicator description	Measurement unit
PA3	Potential for sustainable water management at regional level	This indicator will evaluate the surrounding environment underlying the adoption of water efficiency measures in the tourism industry for partnership areas.	Rank composed by the evaluation of the efficiency of various types of policy measures aimed at promoting water sustainability in tourism
PA4	Percentage of tourism SMEs connected to wastewater treatment facilities	The indicator will indicate how many tourism SMEs are connected to or have developed facilities that allow them to treat their wastewater	Number of tourism SMEs that are connected to or have developed facilities that allow them to treat their wastewater
PA5	Percentage of tourism SMEs providing sustainable	This indicator will reveal the diffusion of sustainable tourism models (e.g.	Number of tourism SMEs that include or not sustainable tourism

Code	Indicator	Indicator description	Measurement unit
	tourism services (e.g. ecotourism)	ecotourism) in Mediterranean tourism destinations.	services in tourism packages/itineraries
PA6	Tourism industry's consumption compared to residential consumption	The indicator will enable to compare tourism sector's average consumption (expressed as consumption per visitor day) with the consumption of local residents/total water consumption during the different touristic seasons	Volume of water consumed per tourist per night / Volume of water consumed per inhabitant per day or average total water consumption per capita per day.

The evaluation of PESTEL factors by tourism SMEs' representatives will allow public authorities of the Mediterranean to monitor the subjective experience of tourism SMEs with regards to the impact of the various PESTEL factors. Since improving water sustainability in tourism is a complex problem that can only be dealt with by achieving institutional and behavioural change, then only by understanding the behaviour and perspectives of tourism SMEs will public authorities manage to develop the corresponding correct policy measures. However, since actual data are also necessary for this purpose, indicators PA4, PA5 and PA6 will complement PA3 by providing a sample for the corresponding issues that will ease the monitoring conducted by public authorities.

9.7 Monitoring fields: Condition of water resources indicators

Indicators pertaining to the third monitoring field have been chosen to

a) help identify the degree to which water resources in coastal areas meet the seasonal needs of the tourism sector in Mediterranean territories, and

b) gather valid evidence on the most frequent sources of water used by tourism SMEs to address issues related to water availability.

Answers from tourism SMEs' representatives can be used by public authorities to estimate the impact of the adoption of water efficiency measures on ecosystem conditions, and more especially on the quality of water in Mediterranean coastal areas. More precisely, by using the data provided by tourism SMEs public authorities will manage, through this sample, to assess and monitor the actual views of SMEs about the condition of water resources in their territory, and to get some information about tourists' opinion in this matter. Through these evaluations of the conditions of water resources public authorities can manage to embed the perspectives of tourism SMEs in their plans to improve water quality and sustainability. The following table summarises the indicators of this category used in the CASTWATER online tool:

Table 12: Condition of water resources indicators

Code	Indicator	Indicator description	Measurement unit
PA7	Dependence of the tourism sector on alternative water resources.	This indicator will measure tourism SMEs' capability to increase the availability of water (thus meeting increasing water demand) via multiple sources.	Number of tourism SMEs utilising various non conventional water resources compared to total number of tourism SMEs.
PA8	Quality of water resources utilised in the tourism industry.	This indicator will evaluate the quality of water resources utilised by tourism SMEs for drinking, bathing and recreation purposes.	Rank composed by the scores tourism SMEs give to the quality of water consumed in different uses of water within the tourism SMEs (e.g. drinking, bathing).
PA9	Frequency of complaints / reports on water quality and water related diseases.	This indicator will measure the frequency of customers' complaints about water quality or/and diseases caused by microorganisms and toxic contaminants in water.	Average number of complaints compared to total number of guests.

9.8 Key learning points of Module 5

- To develop successful policies and improve water efficiency in tourism, it is necessary to understand the perspectives of tourism businesses and SMEs and this is why CASTWATER developed an online self-assessment tool for tourism SMEs.
- Tourism SMEs respond to a number of questions that help calculate the value of specialised indicators.
- The online tool can be utilised by public authorities for the following reasons:
- Enable public authorities to understand the management of water resources by tourism SMEs, as described by the latter.
- Enable public authorities to understand how tourism SMEs evaluate their policies.

- By checking the values of the indicators addressing the adoption of water saving technologies and fixtures by tourism SMEs, public authorities can receive information about the real rate of adoption of water saving technologies and fixtures by tourism SMEs.

- By checking the values of the indicators addressing the application of strategic planning and management of water resources by tourism SMEs, public authorities can receive information about the proliferation of efficient water management systems in the Mediterranean.

- By checking the values of the indicators addressing the application of awareness raising methods, public authorities will benefit from the SMEs' input by being able to develop

appropriate campaigns and incentives to induce the adoption of training and awareness raising processes by tourism SMEs.

- By checking the values of the indicators addressing the issue of actual water consumption of tourism SMEs, public authorities can receive information about the extent of pressure placed on water resources by tourism SMEs in their territories and how it compares with the tourism industry as a whole and with domestic water consumption.

- By checking the values of the indicators addressing the issue of the implementation of current policy frameworks, public authorities will receive the subjective feedback about how tourism SMEs value their policies and the efficiency of their implementation.

- By checking the values of the indicators aiming to reveal the current territorial context of the adoption of water efficiency solutions, public authorities will monitor the subjective experience of tourism SMEs with regards to the impact of the various political, economic, socio-cultural, technological, environmental and legal factors on water sustainability in tourism.

- By checking the values of the indicators about the current condition of water resources, public authorities can manage to embed the perspectives of tourism SMEs in their plans to improve water quality and sustainability.

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11 Annex 1: Exercises

Toolkit Part 2: Exercises

11.1 Exercises for Module 1- Integrated water resource management (IWRM) in the tourism sector

A. State if the following definitions of integrated water resource management are true (T) or false (F):		
1. Integrated water resource management (IWRM) refers to the implementation of policies or measures which serve to increase the amount of water used.	T	F
2. IWRM seeks to maximize the usage of a given volume of water by promoting inessential or low use values through price or non-price measures.	T	F
3. The adaptation and implementation of a strategy by a water institution or consumer to influence the water demand and usage of water to meet any of the following objectives: sustainability of water supply and services, and political acceptability.	T	F
4. Any socially beneficial action that reduces or reschedules average or peak water withdrawals or consumption from either surface or groundwater, consistent with the protection or enhancement of water quality.	T	F

B. Please provide a short description of the 4 categories of integrated water resource management measures:
1.

2.
3.
4.

C. Water consumption by tourists is…

1. … lower than water consumption by residents	
2. … equal to water consumption by residents	
3. … higher than water consumption by residents	
4. There is no point to do the comparisons above	

D. State if the following statements are true (T) or false (F):		
1. Sustainability certificates have proven to be an inefficient measure to promote water efficiency in tourism businesses.	T	F
2. Mediterranean territories need to develop specialized policy to improve integrated water resource management in tourism	T	F
3. Public authorities should refrain from providing financial aid to tourism businesses applying technological innovations that improve integrated water resource management and/or have long returns on investment.	T	F

E. Please explain the factors that have to be considered when developing innovative pricing schemes to improve integrated water resource management:

11.2 Exercises for Module 2 - SWOT analysis of the adoption of water efficiency solutions by the tourism sector

A. State if the following statements are true (T) or false (F):		
1. The technological infrastructure of water supply and distribution in the tourism sector should be considered a weakness of Mediterranean territories.	T	F
2. Low density tourism paradigms are well developed in the Mediterranean.	T	F
3. It is easy to control the use of groundwater and enforce regulations in the Mediterranean.	T	F
4. Participation in projects (such as EU funded projects and others) is a good way to improve and exchange knowledge between project partners.	T	F

B. Please describe the economic factors that strengthen the adoption of water efficiency solutions by tourism businesses and SMEs in the Mediterranean:

C. Please check all valid actions that improve the water efficiency of accommodations:

1. Carry out regular inspections and routine maintenance to prevent leaks and malfunctions in plumbing infrastructure and water appliances.	
2. Reuse toilet water to fill swimming pools.	
3. Remove flow/pressures regulators and aerators on showerheads to decrease consumption by approximately 40%.	
4. Select low flush or dual flush toilets to achieve substantial water savings (approximately 30%).	
5. Install sensors or timers to control faucets so that they do not keep running for a long time if left open.	

D. State if the following statements are true (T) or false (F):

1. River basin management plans have been adequately developed in the Mediterranean.	T	F
2. Extreme climatic events should not be a concern for the tourism industry of the Mediterranean.	T	F

11.3 Exercises for Module 3 - Best practices for the adoption of sustainable tourism water management solutions by SMEs

A. State if it is true (T) or false (F) that tourism SMEs should do the following to improve the water efficiency of their laundry services:		
1. Pre-wash clothes to reduce the amount of water needed to remove stains. This can result in a 25% reduction in water consumption.	T	F
2. Reuse the water from previous rinse cycles for the first wash of the next cycle.	T	F
3. Check regularly for leaks in laundry equipment (e.g. dump valves, inlet valves, tanks) to avoid excessive water usage.	T	F
4. Avoid using washing machines on full load to reduce the amount of water used in each laundry services.	T	F

B. Please describe the key strategies increasing the availability of water to improve water efficiency of tourism businesses and SMEs:

C. Please cite the key solutions adjusting water demand and reducing water consumption for tourism businesses and SMEs:

D. Please cite the two most important transferability factors of best practices for the increase of water sustainability in tourism:

E. Please check all valid sentences:

1. It is absolutely vital at the local level that competent authorities make any water management decisions (e.g. regarding incentives, allocations or restrictions) in full awareness of the availability of their freshwater resources at the catchment level.	
2. It is better to avoid asking the employees of tourism businesses to be careful in the way they consume water.	
3. It is necessary to promote destinations on the basis of sustainable development. This is common practice in the Mediterranean.	

F. State if the following statements are true (T) or false (F):		
1. Discourage customers from reporting malfunctions and leakages in water appliances and infrastructures.	T	F
2. Inform customers about the measures adopted by the enterprise for diminishing water consumption during peak touristic seasons.	T	F

11.5 Exercises for Module 4 - Conflict resolution mechanisms

A. State if the following statements are true (T) or false (F):

1. Public authorities should regard conflict resolution and prevention as more important than the sustainable use of water resources in tourism.	T	F
2. Stakeholder meetings can be used by public authorities to understand the interests, needs and positions of all conflicting parties.	T	F
3. Preparing for the possibility of future conflict is an important element of conflict resolution itself.	T	F

B. Please provide the name of and describe the approaches and techniques that aim at resolving disputes in a non-confrontational way.

C. Please cite all key recommendations for improving cooperation and resolving conflicts in water management in tourism.

D. Please check all valid sentences with regards to the utilisation of mutual gain in conflict resolution:

1. Making sure that unilateral actions can lead to great benefits is a crucial component of any successful conflict resolution strategy.	
2. The key to success of conflict resolution is to convince all parties that they will be better off through cooperative action.	
3. Only major interested parties should have the opportunity to participate in the process.	
4. To find out which approach leads to mutual gain, it is important, in working towards consensus, to identify interests rather than positions.	

E. State if the following statements are true (T) or false (F):		
1. The promotion and support of joint monitoring of activities will render more difficult the planning of the collection, analysis and use management of information concerning joint investments.	T	F
2. Joint monitoring supports ownership and mutual accountability of the management systems and builds on the development of common responsibility.	T	F
3. Joint monitoring does not support results-oriented management approaches.	T	F

11.6 Exercises for Module 5: Comparative policy analysis recommendations

A. State if the following statements are true (T) or false (F):		
1. A comprehensive regulatory framework for tourism water management in European Union Mediterranean regions already exists.	T	F
	T	F

2. All European Union Mediterranean regions make use of incentives and public awareness tools for promoting responsible water management to both customers and businesses.		
3. Most prevailing problems encountered in the process of implementing water management policies are of financial nature only.	T	F

B. Please briefly describe an example of a national regulatory framework aimed at improving water sustainability in tourism

C. Please check all valid actions that advance infrastructure development:

1. Develop a common vision for both sustainable tourism and sustainable management of water resources.	
2. Promote innovative solutions in water infrastructure by involving R&D stakeholders.	
3. Innovate on water reserve management by creating a water reserve network.	
4. Promote cross-sectoral tourism water management approaches in a mixed urban scenario.	

11.7 Exercises for Module 6 - The CASTWATER online monitoring tool

A. State if the following statements are true (T) or false (F):		
1. By checking the values of the indicators about awareness raising, public authorities will benefit from the SMEs' input by being able to develop the appropriate incentives to induce the adoption of training processes by tourism SMEs.	T	F
2. Receiving data about the views of tourism SMEs and understanding them is a crucial component of contemporary policy making, since successful policies can only be developed via collaborating with the private sector.	T	F
3. By checking the values of the indicators about strategic planning, public authorities can receive information about the adoption of water saving fixtures by tourism SMEs.	T	F

B. Please explain the benefits of the CASTWATER online tool for tourism SMEs that use it:

C. Please check all valid indicator categories included in the online tool monitoring fields:

1. Strategic planning and management	
2. Territorial context	
3. Actual water consumption	
4. Condition of water resources	

5. Water saving fixtures	

D. State if the following statements are true (T) or false (F):		
1. The online tool can be utilised by public authorities to develop an objective understanding of the management of water resources by tourism SMEs.	T	F
2. **The online tool can be utilised by public authorities to understand how tourism SMEs evaluate their policies.**	T	F

11.8 Solutions

Module 1 exercises

A. Correct answers: 1-False, 2-False, 3-False, 4-True
B. Answer found in “Learning Outcomes and Modules”, p. 15-16
C. Correct answer: Option 3
D. Correct answers: 1-False, 2-True, 3-False
E. Answer found in “Learning Outcomes and Modules”, p. 18

Module 2 exercises

A. Correct answers: 1-False, 2-False, 3-False, 4-True
B. Answer found in “Learning Outcomes and Modules”, p. 25-27
C. Correct answer: Options 1, 2 and 3
D. Correct answers: 1-False, 2-False

Module 3 exercises

A. Correct answers: 1-False, 2-True, 3-True, 4-False
B. Answer found in “Learning Outcomes and Modules”, p. 36
C. Answer found in “Learning Outcomes and Modules”, p. 37
D. Answer found in “Learning Outcomes and Modules”, p. 42-43
E. Correct answer: Option 1
F. Correct answers: 1-False, 2-True

Module 4 exercises

A. Correct answers: 1-False, 2-True, 3- True
B. Answer found in “Learning Outcomes and Modules”, p. 51
C. Answer found in “Learning Outcomes and Modules”, p.51-52
D. Correct answers: Options 2 and 4
E. Correct answers: 1-False, 2-True, 3-False

Module 5 exercises

A. Correct answers: 1-False, 2-True, 3-False
B. Answer found in “Learning Outcomes and Modules”, p. 58
C. Correct answer: Options 2 and 3

Module 6 exercises

A. Correct answers: 1-True, 2-True, 3-False
B. Answer found in “Learning Outcomes and Modules”, p. 78

C. Correct answer: Options 2 and 4

D. Correct answers: 1-False, 2-True

12 Annex 2: Presentations

Toolkit Part 3: CASTWATER presentations of modules

CASTWATER

ACTIVITY A3.8

TOOLKIT PART 3 – MODULE 1

INTEGRATED WATER RESOURCE MANAGEMENT

CASTWATER «Project co-financed by the European Regional Development Fund»

CASTWATER MODULES: OVERVIEW

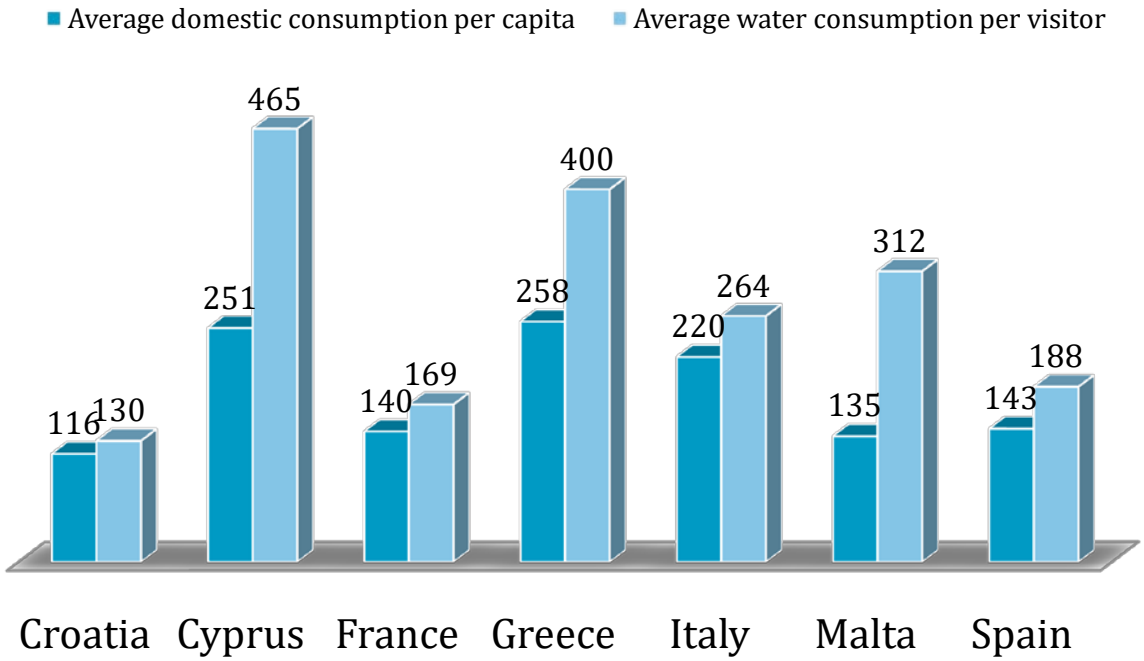
- Module 1: Learning the characteristics of integrated water resource management (IWRM) in the tourism sector
- Module 2: SWOT analysis of the process of adopting water efficiency and management solutions by the tourism sector
- Module 3: Learning best practices for the adoption of sustainable tourism water management solutions by SMEs
- Module 4: Learning how to design conflict resolution mechanisms
- Module 5: Comparative policy analysis recommendations
- Module 6: How to use and analyse the results of the CASTWATER online monitoring tool

THE NEED FOR INTEGRATED WATER RESOURCE MANAGEMENT

- Water scarcity is a major concern for the countries of the Mediterranean.
- Water resources in MED territories are under pressure due to the increasing number of tourists and the extremely high peak water consumption in the summer.
- Tourists consume twice the water compared to residents' consumption with a European tourist consuming around 300 liters per day compared to residential water consumption at approximately 150 liters (Gøssling et al., 2012; European Environmental Agency, 2009).
- There are a number of reasons for higher tourist water consumption such as (Eurostat, 2009):
    - Maintenance of grounds (irrigation)
    - Daily room cleaning
    - Daily laundry
    - Maintenance of swimming pools
    - Intensive kitchen activities
    - A 'pleasure approach' to showers and baths
    - Indirect water consumption (i.e. consumption in restaurants and other leisure activities)

THE NEED FOR INTEGRATED WATER RESOURCE MANAGEMENT: AN EXAMPLE

Comparison of average tourist vs. average resident water consumption per day, as per CASTWATER research:



Source: Eurostat (2015), Becken (2014), and Istat (2017)

4

INTEGRATED WATER RESOURCE MANAGEMENT: DEFINITION

Integrated water resource management (IWRM), will address this issue by achieving **maximum utilization** and **minimum waste** of **water** in the **tourism** sector.

Proposed definitions for integrated water resource management:

1. Integrated water resource management refers to the implementation of policies or measures which serve to control or influence the amount of water used (UK Water Industry Research Limited, 1996).
2. IWRM seeks to maximize the usage of a given volume of water by curbing inessential or low use values through price or non-price measures (SADC, 2003).
3. The adaptation and implementation of a strategy by a water institution or consumer to influence the water demand and usage of water to meet any of the following objectives: economic efficiency, social development, social equity, environmental protection, sustainability of water supply and services, and political acceptability (Ministry of Water Affairs and Forestry, South Africa, 2004).
4. Any socially beneficial action that reduces or reschedules average or peak water withdrawals or consumption from either surface or groundwater, consistent with the protection or enhancement of water quality' (Louw and Kassier, 2002).

Derived from the aforementioned definitions, **the term integrated water resource management measures in this text refers to any activity, law, practice, and/or technological device that can potentially reduce or optimize water use.**

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INTEGRATED WATER RESOURCE MANAGEMENT: TYPES OF MEASURES (1)

•**Regulations/Legislations**: To enforce laws and regulations currently in use and to continue to update and develop laws and legislations to implement the best practices in water use. The successful application of regulatory/legislative measures is perhaps, the most important responsibility of public authorities, as, for example, can be seen here.

oExample: Measures developed to penalised excesses in water consumption.

•**Awareness (education):** To drive people to change their water-use practices, by increasing their knowledge of conversation issues and attempting to influence and change their attitude towards them. Awareness measures are designed and run by water utilities, schools and authorities.

oExample: Information and awareness local events.

INTEGRATED WATER RESOURCE MANAGEMENT: TYPES OF MEASURES (2)

•**Price (economic):** The price of water and the tariffs plans are key elements and essential tools of integrated water resource management, to control and raise the efficiency of water use in all sectors regardless of the water source. Economic measures are typically designed and ran by water authorities, as can be seen here.

oExample: Pricing plans that encourage reduced water consumption

•**Adoption of technologies and demand programs:** This includes adopting new measures such as monitoring tools with smart meters, installation of low taps and showers, use of alternative water sources, use of leakage detection technologies.

oExample: Setting up systems which economize on water – flow modulators (pressure relief valves on the network inside the home, small water cisterns for flushing toilets, flow-reducing aerators for taps and shower heads), and electrical appliances which use less water, as can be seen here.

INTEGRATED WATER RESOURCE MANAGEMENT: PROPOSED POLICIES (1)

•Formation and efficient implementation of innovative pricing schemes that account for the fact that the economic cost of water for the majority of the touristic enterprises is not a primary motive behind improving their water efficiency. Innovative pricing schemes and tariffs should consider the need of touristic enterprises to achieve water efficiency as a means for developing a green image and increasing the demand for their services (e.g. progressive water tariffs, double structure water tariffs).

•Make available sustainability certificates or develop EU-wide labeling systems for water efficiency in tourism; then provide tourism enterprises with incentives so that they obtain the certificate or a good label. Sustainability certificates constitute an excellent way to achieve the green image signaling effect.

•Provide tourism businesses and especially SMEs with financial support, so that they can adopt technologies improving water efficiency in tourism with high cost (e.g. smart meter, leakage detection systems, intelligent monitor and controlling systems)

INTEGRATED WATER RESOURCE MANAGEMENT: PROPOSED POLICIES (2)

•Develop and/or promote and support advanced and periodic training courses and workshops by the tourism sector in order to train the employees to apply efficient integrated water resource management measures and technologies.

•With the exception of cases where relevant policy has already been developed (e.g. Murcia), Mediterranean regions need to develop and implement specific policies and regulations to help water efficiency in the touristic sector.

•Tourism establishments need to capitalize more upon alternative in-house water sources, and public authorities should do more to support them in their efforts to use such sources. This could be achieved by co-financing or tax releases or any other financial incentive. Alternative in-house water sources can significantly improve the green image of tourism businesses and, at the same time, reduce the cost of water.

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CASTWATER

ACTIVITY A3.8

TOOLKIT PART 3 – MODULE 2

PESTEL FACTORS WITH IMPACT ON THE ADOPTION OF WATER EFFICIENCY SOLUTIONS BY THE TOURISM SECTOR

CASTWATER «Project co-financed by the European Regional Development Fund»

CASTWATER MODULES: OVERVIEW

- Module 1: Learning the characteristics of integrated water resource management (IWRM) in the tourism sector
- Module 2: SWOT analysis of the process of adopting water efficiency and management solutions by the tourism sector
- Module 3: Learning best practices for the adoption of sustainable tourism water management solutions by SMEs
- Module 4: Learning how to design conflict resolution mechanisms
- Module 5: Comparative policy analysis recommendations
- Module 6: How to use and analyse the results of the CASTWATER online monitoring tool

SWOT Analysis of PESTEL Factors: Rationale

•The adoption of efficient water demand management and, in general, water efficiency solutions by the SMEs of the tourism sector depend on a number of different factors: *Political*, *Economic*, *Sociocultural*, *Technological*, *Environmental*, *and Legal* (***PESTEL***).

•To develop successful policy measures, it is necessary to understand the strengths, weaknesses, opportunities and threats (SWOT) that characterise this process in relation to these categories of factors.

•Hence, public authorities have to make a SWOT analysis of these factors.

•Within CASTWATER, this was done through **desk research** and a **CASTWATER survey** among three main types of actors within each territory:

- Regional authority representatives (state services)
- Socio-professional representatives of the tourism sector
- Representatives of local authorities (communities).
- Additional respondents from the research sphere for example were also included when possible.

SWOT ANALYSIS OF PESTEL FACTORS: DESK RESEARCH FINDINGS

STRENGTHS = build on…

Political factors:
-Water efficiency oriented local policies
Economic factors:
-Iniciative water prices and special pricing (progressive, seasonal)
-Growing trends in the number of tourists
Socio-cultural factors:
-Good knowledge about the resource and existing solutions
-Awareness (of policy makers, tourism staff, tourists)
-Traditional value of scarce water
-Water sharing culture
Technological factors:
-Good condition of water infrastructures
-Good availability of technology to measure water and to reduce water consumption
-Availability of water recycling technologies

WEAKNESS = correct or eliminate

Economic factors:
-Low water price (low incentives)
-Growing trends in tourism standards (more water intensive)
Socio-cultural factors:
-Cultural perception of water resources as unlimited
-Cultural reluctance to water reuse
-Little interest to promote sustainable tourism image of the territory
Technological factors:
-Aging and leaking water infrastructures (necessary renewal)
-Poorly developed technology to recover rainwater
-Slow development of technology for water reuse
-Available supply of alternative water resources as a demotivator for efficiency

OPPORTUNITIES = exploit…

Political factors:
-Existing sustainable development policies at national level
-Existing international sustainable tourism development policies
-Adoption of internal policies of tourism operators, certification programs
-Effective framework for water governance, with participation of water users and integrated planning
Economic factors:
-Reasonable return on investment for water saving devices
Environmental factors:
-Scarce water resources in an increasingly vulnerable region to climate change consequences (trends and extreme events)
-Vulnerable ecosystems highly dependent on water flows
-Most water stressed season is the most intensive for tourism

THREATS = mitigate…

Economic factors:
-Competition with touristic destinations with more water supply
Legal factors:
-Lack of coordination between urban planning and water use planning
-Possible legal barriers to water reuse
-Weak enforcement of regulations

Source: CASTWATER partnership, 2017. *D3.4.1: 'SWOT and impact analysis on the adoption of water efficiency and management solutions by the tourism sector'* (p. 70)

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POLITICAL FACTORS

Strengths:

•Public sector administrators and employees can take the advise of already implemented EU policies aiming to increase sustainability and specifically water efficiency.

- ***Examples:*** Mediterranean Strategy for Sustainable Development (MSSD), EU Water Framework Directive.

•In some other cases (France, Spain), there are already policies providing incentives for implementing water efficiency measures.

- ***Examples:*** river management plans, taxation and efficiency objectives, water partition zones in water scarce areas with special abstraction rules.

Opportunities:

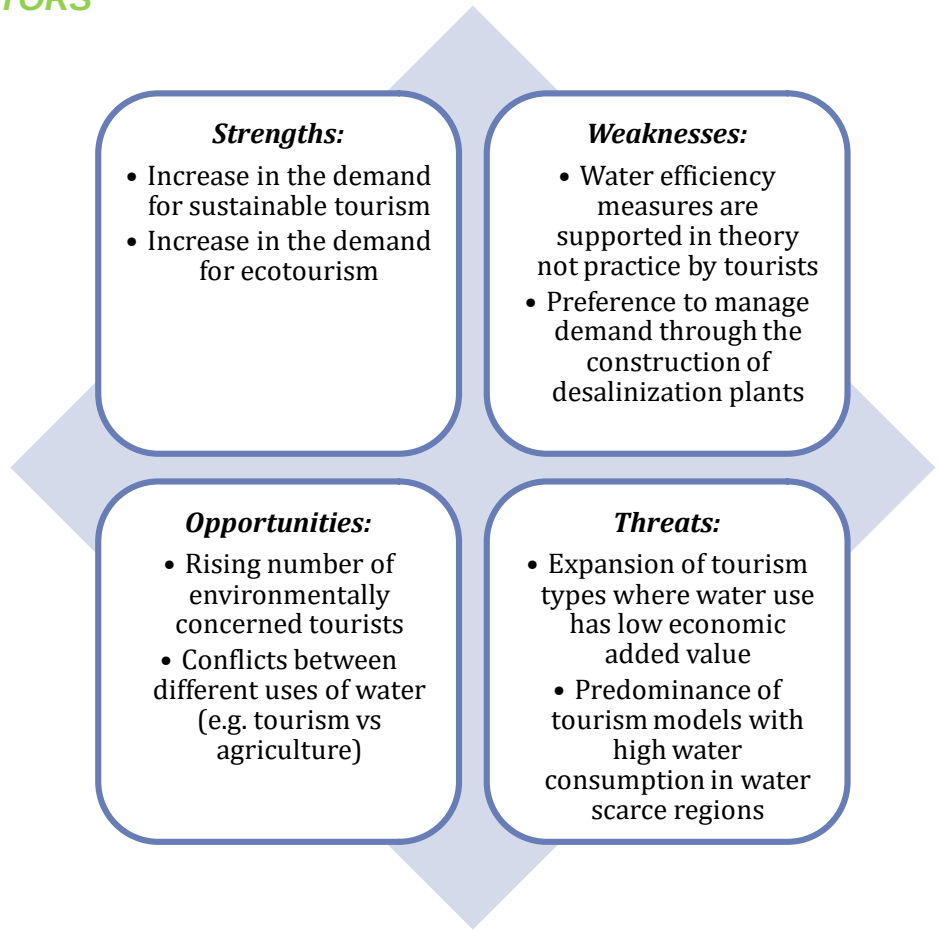
•Capitalising upon recently developed sustainable tourism strategies and policies, including resource efficiency policies and, hence, water efficiency.

- ***Examples:*** United Nations Environment Program, Murcia's Strategic Plan for Tourism 2015-2019, Croatian National Tourism Development Strategy.

•Applying the EU Water Framework Directive (2000), which sets the water basin level as the best management level and involves water users in the management processes via River Basin Management Plans (RBMP) so as to balance all needs and to make it more enforceable.

•Improving the supply of water by following the advice of OECD with regards to the formation of relevant public-private partnerships (OECD, 2009).

ECONOMIC FACTORS



SOCIO-CULTURAL FACTORS (1)

Cultural factors should be considered mostly a weakness of the process of adopting water efficiency measures:

•The predominant model in Mediterranean tourism is the 3S (Sea, Sun and Sand) model which is usually (but not solely) oriented toward mass tourism (Plan Bleu report, 2017) and does not attract the most environmentally concerned tourists.

•Observed current trends point towards more water intensive leisure activities being developed even in territories with scarce water resources.

•Older generations were more sensible to MED climate irregularities and the possibility of water scarcity in the region. Nowadays, access is easy and an opposite perception has been formed, i.e. that water is a cheap commodity and abundant resource (Laureano et al., 2008).

•Established habits and misconceptions need to be overcome in parallel, especially in the agriculture sector where the products produced on such water type are not well accepted by the consumers.

•These difficulties are exacerbated by the fact that Mediterranean territories are not a homogeneous field with respect to these issues.

Hence, it is necessary to increase the awareness in tourism about the need for water sustainability

SOCIO-CULTURAL FACTORS (2)

1. It is absolutely vital at the local level that competent authorities make any water management decisions (e.g. regarding incentives, allocations or restrictions) in full awareness of the availability of their freshwater resources at the catchment level and in full awareness of the actual needs of all actors in their jurisdiction. (EEA Report 1/2012).
2. Participation in projects (such as EU funded projects and others) is a good way to improve and exchange knowledge between project partners.
3. It is necessary to share knowledge with the constituents of each territory and, more precisely, to inform tourism businesses to ask their employees and customers to be careful in the way they consume water, in order to reduce costs.
4. Promote destinations on the basis of sustainable development which is not the case yet for the Mediterranean.
5. Ensure that local policy makers can read, interpret and bring the information in an accessible format, or access to continuous training for local policy makers.

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TECHNOLOGICAL FACTORS

•In general, the technological infrastructure of water supply and distribution in the tourism sector should be considered a strength of Mediterranean territories.

•Water supply networks in good condition (no losses) are important for the promotion of water efficiency measures, as it may be difficult to advocate for efficiencies when the public network is inefficient.

•On the other hand, improvements can definitely be made and public administrators should seize the opportunity to actively implement the following technological innovations:

- Technologies to improve measuring water consumption. Examples: water metering instruments, such as the telematic control of consumption.
- Technologies reducing water consumption. Examples: flow restrictors, dual flush toilets, or movement sensors in water taps.
- Technologies promoting rainwater recovery. Examples: the systems range from rather simple domestic models to sophisticated public collecting networks for storm waters.
- Water reuse technologies. Examples: Wastewater reuse has developed from simple collection and disposal of waste water without any treatment to very sophisticated engineering solutions for the treatment of wastewater. However, technically feasible water reuse projects often do not get implemented due to institutional, economic, and organizational barriers, or poor public perception and education. To this aim, public administrators should follow the relevant EU water reuse guidelines (2016)

ENVIRONMENTAL FACTORS

- ***The environmental factors affecting the process of adopting water efficiency measures can be considered an opportunity for strengthening this process, to the extent that they render it indispensable*** (Source: CASTWATER partnership, 2017. SWOT and Impact Analysis on the Adoption of Water Efficiency and Management Solutions by the Tourism Sector)
- ***Environmental factors incentivising water efficiency:***
  - *Mediterranean variable landscape:* Tourism territories in the Mediterranean have variable landscape, with wetlands and transitional waters, which are vulnerable but valuable ecosystems. This vulnerability and necessity to preserve is an additional incentive to have more efficient water use.
  - *Spatial concentration of tourism:* Mediterranean tourism is mostly concentrated on the coastal line, and is confined to urban areas where the highest water demand occurs. Low density ecotourism with lower water demand is less developed.
  - *Climate change consequences:* As a "hot spot" of climate change, the Mediterranean will be, in the twenty first century, the site of particularly marked changes in terms of rises in temperature and decreases in average rainfall, inter-annual variability and extreme meteorological events. The climate models reveal temperature rises likely to range between 2.2 and 5.1°C for the time frame 2100 and a decrease in average rainfall in the range of 4 to 27%, with a particularly marked decline in the summer.
  - *Vulnerability to extreme events:* As just indicated above, climate change will increase the number of extreme climatic events such as heat waves, storms or forest fires. In order to decrease their vulnerability to those events, the territories need to get prepared for emergency responses in particular in the water supply sector with more water storing capacities.

LEGAL FACTORS

The results of the CASTWATER survey show that legislation capable of regulating and promoting such measures has not been developed in the Mediterranean regions to the extent that is necessary. More precisely:

•There is no adequate coordination and preparation of River Basing Management Plans and there are no criteria and provisions in place for land uses that can strengthen water sustainability.

•Despite the water reuse applications already developed in many countries, a number of barriers still prevent the widespread implementation of water reuse throughout Europe and on a global scale.

•Costly monitoring of compliance, such as that required by several recent regulations, could be an impediment to water reuse development. (Alcade et al, 2014).

•In Europe, there are no guidelines or regulations at the European Union (EU) level. However, several environmental Directives must be taken into account when developing legislation to govern future water reuse at the EU level, such as e.g. the Water Framework Directive.

•Groundwater European legislation is integrated In the Water Framework Directive with a new daughter Groundwater Directive issued in 2008 aiming to a good quantitative et chemical status of these resources by 2015 as it has become increasingly obvious that groundwater should not only be viewed as a water supply reservoir, but should also be protected for its environmental value. The respondents mentioned several times in previous comments that users tend to drill and use ground water resources as a cheaper access to water than through a connection to the water supply network. In such cases, until there is a better control there will be no incentives for these users to invest in water efficiency measures.

•Though respondents acknowledged the importance of such regulations for water efficiency measures, the situation in each country is difficult to assess through the replies. In some cases, aquifers are already classified as over exploited and cannot be used as an alternative resource. The most recurrent comment however touched upon the difficulty to control the use of groundwater (illegal use) and enforce regulations.

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ACTIVITY A3.8

TOOLKIT PART 3 – MODULE 3

BEST PRACTICES FOR THE ADOPTION OF SUSTAINABLE WATER MANAGEMENT SOLUTIONS BY TOURISM SMES

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CASTWATER MODULES: OVERVIEW

- Module 1: Learning the characteristics of integrated water resource management (IWRM) in the tourism sector
- Module 2: SWOT analysis of the process of adopting water efficiency and management solutions by the tourism sector
- Module 3: Learning best practices for the adoption of sustainable tourism water management solutions by SMEs
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- Module 6: How to use and analyse the results of the CASTWATER online monitoring tool

BEST PRACTICES: OVERVIEW AND TYPES

Water consumption can be managed through strategies that increase water availability and strategies adjusting water demand and reducing water consumption (Gøssling et al., 2011).

- **Example of the former:** Water recycling constitutes an excellent way to conserve water in an accessible, smart and effective manner, providing tourism establishments with additional water resources in situations where it's difficult to cover the growing demand for water through public utilities.

- **Example of the latter:** Replacing an 18 litres per flush toilet with an ultra-low volume 6 litres flush model represents a 70% savings in water flushed, whilst reducing indoor water use by about 30%

KEY TYPES OF STRATEGIES INCREASING WATER AVAILABILITY

Greywater reuse

- Greywater refers to untreated household/business wastewater that has not come into contact with sewage (or "black water") and can be reused for purposes that do not require potable water such as landscaping, agriculture, or for flushing toilets. Greywater reuse systems range from simple low-cost devices that divert greywater to direct reuse, such as in toilets or outdoor landscaping, to complex treatment processes incorporating sedimentation tanks, bioreactors, filters, pumps, and disinfection, and can enable up to 50 per cent of wastewater to be returned to the property after treatment for toilet flushing.

Rainwater harvesting

- Several tourism establishments (e.g. hotels, restaurants) have large roofs that can be used to gather fresh rainwater, as well as additional impervious surfaces such as parking lots and sports facilities, which can be utilised to capture storm water on site. Rainwater harvesting refers to the collection and storing of rainwater from rooftops and surfaces into natural reservoirs or tanks, with the aim to be reused for gardens, livestock, irrigation, indoor heating and domestic use with proper treatment.

KEY TYPES OF STRATEGIES ADJUSTING WATER DEMAND & REDUCING WATER CONSUMPTION

Creating a water management plan

- A water management plan provides clear information/data about the areas for targeted interventions / improvements to increase water efficiency.

Using water efficient fixtures

- A number of affordable and easy-to-use water saving devices can improve tourism facilities' water efficiency without requiring behavioural change.

Regular maintenance of water infrastructures

- Proper inspection and maintenance of plumbing fixtures and appliances through regular maintenance programmes can help minimise malfunctions and leaks.

Educational programmes for staff

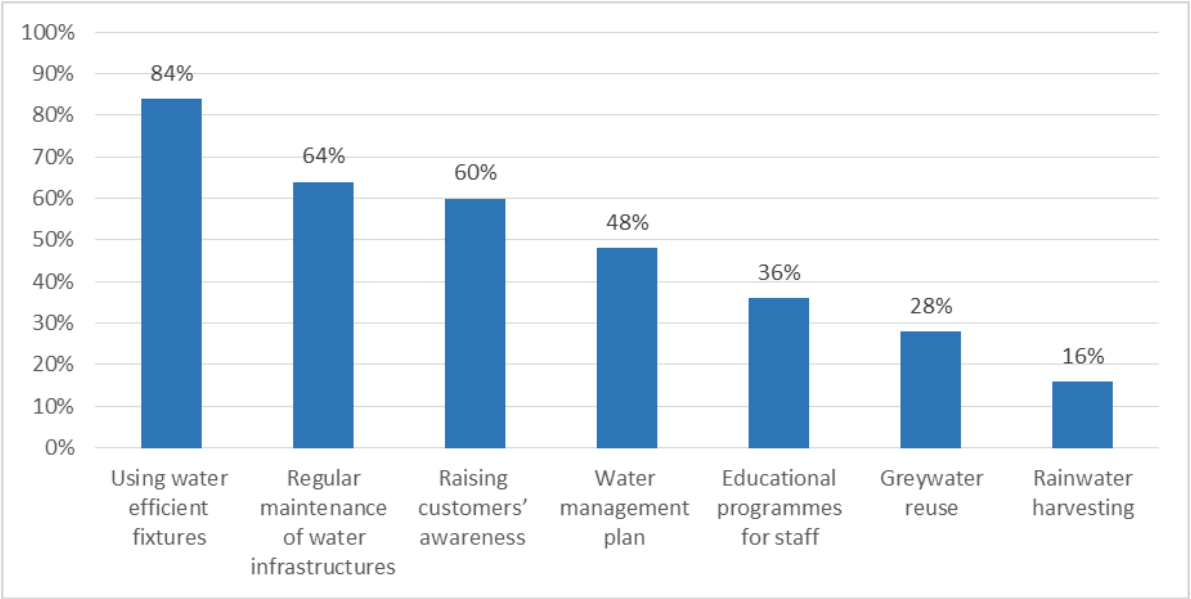
- Training staff on how to make prudent use of water and how to maintain equipment for optimum energy-efficiency is highly recommended in order to mobilise personnel to adopt sustainable water consumption patterns.

Raising customers' awareness

- Raising customers' awareness about water issues and businesses' commitment to promote sustainable management will help to make the use of water resources more prudent, preventing wasteful practices.

CASTWATER SURVEY: WATER MANAGEMENT SOLUTIONS ADOPTED BY TOURISM SMES

CASTWATER survey results show that these are the most common solutions adopted by tourism establishments to improve water efficiency.



Source: CASTWATER partnership, 2017. *Good practice guide on the adoption of sustainable tourism water management solutions by SMEs,* p.20

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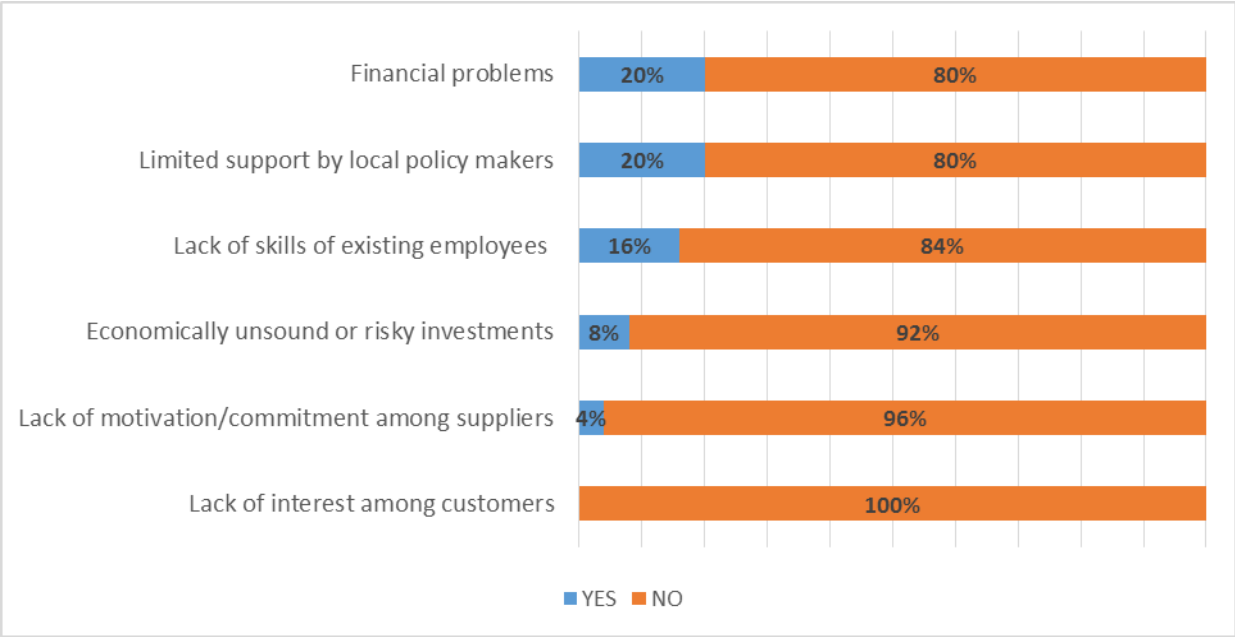
CASTWATER SURVEY: PROBLEMS ENCOUNTERED DURING THE IMPLEMENTATION

The following figure presents the main problems noticed during the implementation of water efficiency measures found in CASTWATER surveys:



Source: CASTWATER partnership, 2017. *Good practice guide on the adoption of sustainable tourism water management solutions by SMEs,* p.22

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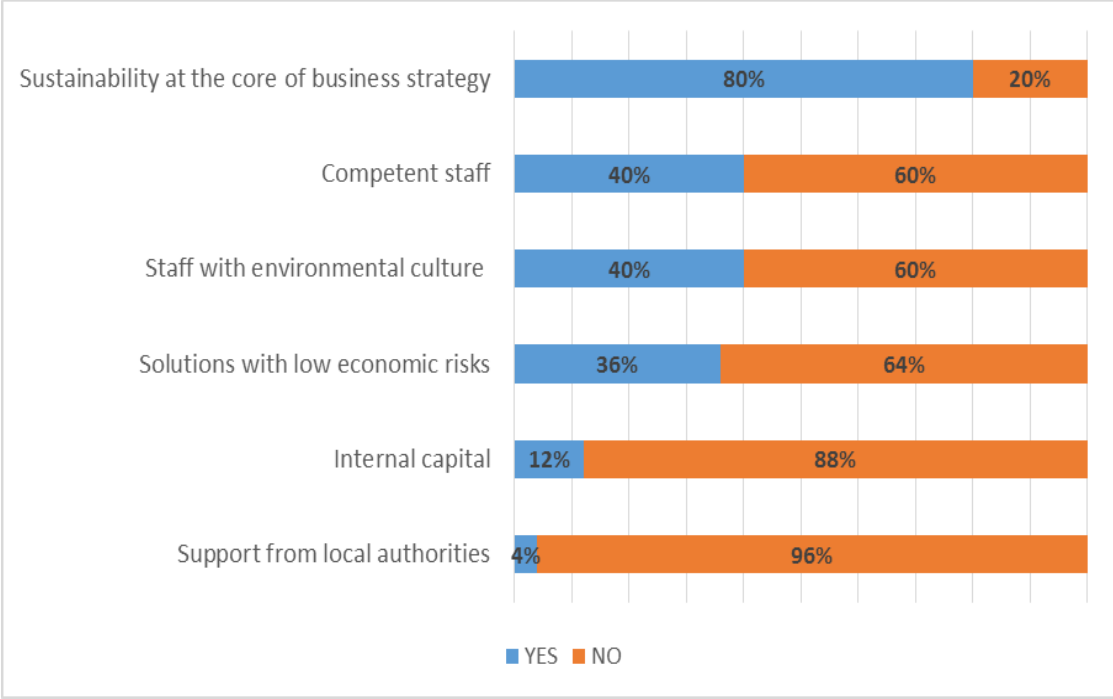
CASTWATER SURVEY: ENABLERS FOR ADOPTING WATER MANAGEMENT MEASURES

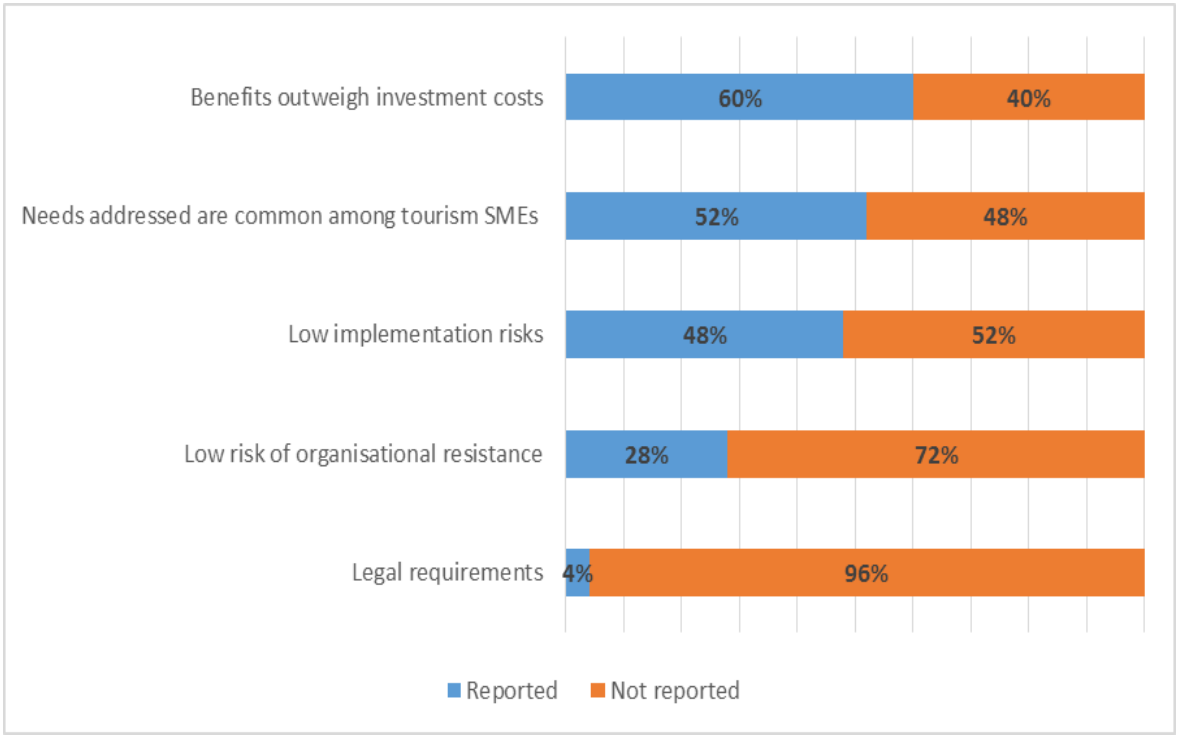
The enablers for the implementation of water efficiency measures are summarised in the figure below:



Source: CASTWATER partnership, 2017. *Good practice guide on the adoption of sustainable tourism water management solutions by SMEs,* p.25

CASTWATER SURVEY: FACTORS INCREASING THE TRANSFERABILITY OF MEASURES

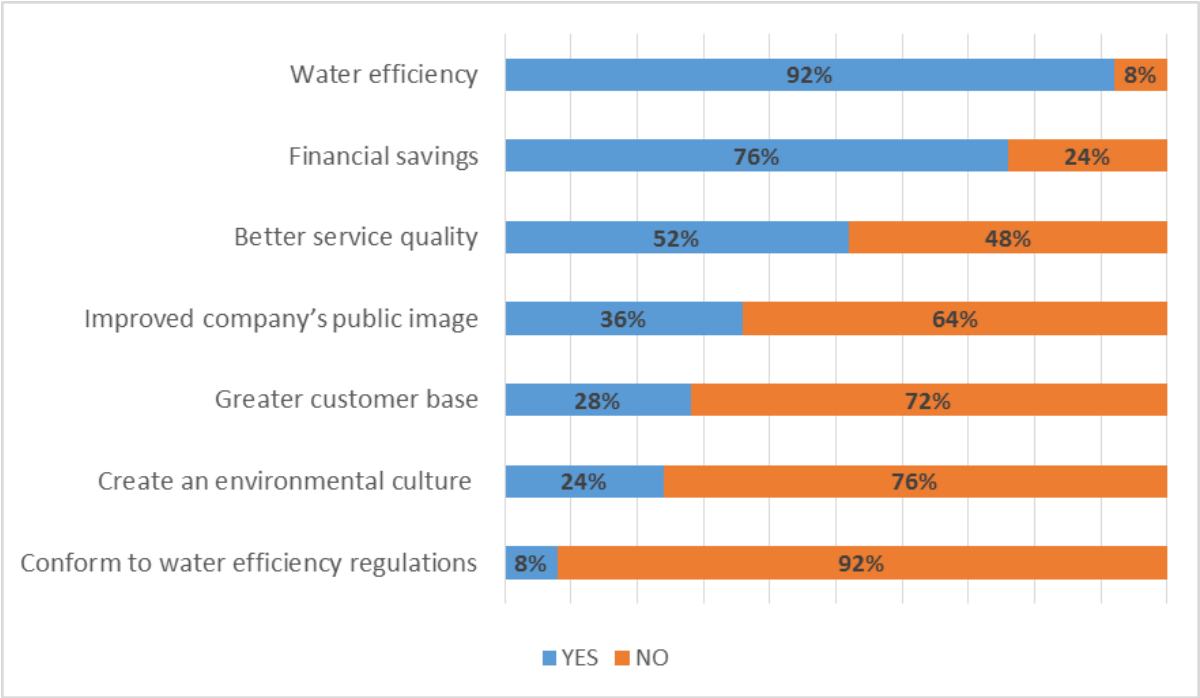
The following figure summarises the factors that foster the transferability potential of water efficiency solutions:



Source: CASTWATER partnership, 2017. *Good practice guide on the adoption of sustainable tourism water management solutions by SMEs,* p.26

CASTWATER SURVEY: ACHIEVED BENEFITS FROM WATER EFFICIENCY MEASURES

The following figure summarises the positive effects from the implementation of water efficiency measures:



Source: CASTWATER partnership, 2017. *Good practice guide on the adoption of sustainable tourism water management solutions by SMEs,* p.23

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Actions to develop a successful water conservation programme
Conduct a water audit to measure water consumption, identify the major water costs and determine where savings can be achieved.
Compare consumption figures with tourism industry benchmarks (if available) to determine the potential for savings.
Evaluate company's financial performance or status, to check the feasibility/viability of the project.
Search for funding opportunities (e.g. grants, preferential loans) from EU financial schemes, governmental sources, foundations, professional associations, and financial institutions.
Monitor calls for projects on new water technologies or/and water reduction schemes.
Establish realistic water reduction targets for each department (e.g. kitchen, guest rooms, gardens, etc.) and the entire establishment.
Prescribe a series of potential water management measures to minimise consumption, based on company's needs and priorities, as well as facilities' technical specifications.
Carry out a cost-benefit analysis to make informed decisions about the actions to be taken. What is more, tourism SMEs should calculate the payback period (or else the return on investment for all suggested measures.

SUGGESTED ACTIONS INCREASING WATER EFFICIENCY: ACCOMMODATION

Actions to improve water efficiency of accommodations
Install or retrofit flow/pressures regulators and aerators on showerheads to decrease consumption by approximately 40%.
Install sensors or timers to control faucets so that they do not keep running for a long time if left open.
Select low flush or dual flush toilets to achieve substantial water savings (approximately 30%).
Use rainwater or pool water for toilet flushing. This requires the installation of a rainwater harvesting system.
Carry out regular inspections and routine maintenance to prevent leaks and malfunctions in plumbing infrastructure and water appliances.

SUGGESTED ACTIONS INCREASING WATER EFFICIENCY: LAUNDRY SERVICES

Actions to develop improve water efficiency of laundry services
Sort the laundry according to the degree of soiling.
Use washing machines on full load to reduce the number of rinse cycles, without reducing quality.
Reuse the water from previous rinse cycles for the first wash of the next cycle. This can be realized by installing temporary holding tanks.
Avoid to pre-wash clothes and use water saving programs. This can result in a 25% reduction in water consumption.
Avoid to use high polluting detergents and cleaning products to allow water reuse for toilet flushing and irrigation.
Check regularly for leaks in laundry equipment (e.g. dump valves, inlet valves, tanks) to avoid excessive water usage.

SUGGESTED ACTIONS INCREASING WATER EFFICIENCY: KITCHEN FUNCTIONS

Actions to develop improve water efficiency of kitchen functions
Use low-flow pressure spray valves for pre-washing.
Soak dishes in a basin of water before placing them into the dishwasher in order to minimize pre-washing time.
Use dishwashers on full load and turn off the devices when not in use.
Avoid the excessive use of detergent and cleaning products, allowing to re-use water from washing machines for removing food residues on dishes (during the pre-washing stage).
Purchase water efficient washing and cooking appliances such as dishwashers, ice machines and steam cookers. This will enable to decrease water and energy consumption by at least 10%.
Avoid to defrost food using water and minimize the use of ice machines.

SUGGESTED ACTIONS INCREASING WATER EFFICIENCY: SWIMMING POOLS

Actions to develop improve water efficiency of swimming pools
Determine the appropriate sizing before installing a swimming pool, taking into account the envisioned use(s), facilities' capacity and maintenance costs.
Use pool covers during closing hours to minimize evaporation and reduce the need to empty and refill.
Use level sensors to prevent overflow.
Install sensors or timers to control showers by the pool.
Conduct routine inspections/reviews on filtration plant's effectiveness, including regular maintenance to prevent leaks and malfunctions.
Consider to reuse pool water for toilet flushing and other washing purposes.

SUGGESTED ACTIONS INCREASING WATER EFFICIENCY: IRRIGATION

Actions to develop improve water efficiency of irrigation
Install an efficient irrigation system to optimise water usage for gardening based on environmental conditions. This may include fitting timers on sprinklers to control water use and moisture sensors to avoid over-watering.
Plant green areas with species that minimise irrigation requirements and are adjusted to areas' humidity level.
Schedule gardening either early in the morning or late in the evening to prevent water loss due to evaporation.
Select soil with high water holding capacity for landscaping works to reduce infiltration loss.
Check regularly for leaks and malfunctions in irrigation equipment.
Consider to use greywater from baths and sinks or waste water (after appropriate treatment) for irrigation.

SUGGESTED ACTIONS INCREASING WATER EFFICIENCY: TRAINING STAFF PROCESSES

Actions to develop improve water efficiency via training
Communicate company's commitment to promote water conservation, including water reduction targets to all employees.
Train staff on how to perform water management procedures, make prudent use of water and use new technologies and water devices for optimum resource efficiency.
Encourage staff to suggest new ways and measures to decrease water consumption.
Establish a reward system for employees that show a strong commitment to promote water conservation and achieve the targets set by the enterprise.

SUGGESTED ACTIONS INCREASING WATER EFFICIENCY: CUSTOMER ENGAGEMENT

Actions to develop improve water efficiency via customer engagement
Communicate the problem of water scarcity and its impact on the environment, economy and local community.
Inform customers about the measures adopted by the enterprise for diminishing water consumption during peak touristic seasons.
Invite customers to reuse towels and linens.
Display water saving notices to raise customers' awareness on water conservation.
Encourage guests to abolish wasteful practices (e.g. long-time showers, letting the tap run when brushing teeth).
Invite customers to report malfunctions and leakages in water appliances and infrastructures.
Suggest ways to diminish water consumption in all areas/departments of the establishment.

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"ACTIVITY A3.8
TOOLKIT PART 3 – MODULE 4
CONFLICT RESOLUTION"

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CASTWATER MODULES: OVERVIEW

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CONFLICT RESOLUTION MECHANISMS: RATIONALE & DEFINITIONS

•Conflicts arise when implementing policies to promote water efficiency in tourism.

•Conflict resolution mechanisms refer to a broad array of tools used to anticipate, prevent and react to conflicts that emerge during the implementation of water demand management and in general water efficiency measures.

•Conflict resolution is in need of a conflict management strategy that involves a combination of several types of policy tools, used to help public authorities identify the issues behind the positions of various conflicting stakeholders and find out 'win-win' solutions that leave all parties better off with the outcome.

KEY ELEMENTS OF SUCCESSFUL CONFLICT RESOLUTION

- ***Stakeholder participation and engagement:***
  - Public authorities have to enable discussions with stakeholders about issues that cause disputes, as long as they maintain the preservation of water resources as the key target of their policy making.

- ***Mutual gain for all parties:***
  - Public authorities should prepare and implement regulation that leads to mutual gain for all parties participating in the resolution of disputes whilst supporting and applying water efficiency measures.

- ***Efficient monitoring:***
  - Public authorities should implement efficient monitoring processes of the implementation of policy measures.

- ***Specialised mechanisms:***
  - Public authorities should develop mechanisms that specialise in dispute management.

STAKEHOLDER PARTICIPATION & ENGAGEMENT

•Public authorities should anticipate and try to resolve any potential conflicts developing due to regulation about the sustainable use of water resources in tourism, only after making sure that water sustainability in tourism has been successfully promoted.

•Preparing for the possibility of future conflict is an important element of conflict resolution itself.

•It is useful to enable the discussion of issues that could cause disputes through stakeholder meetings and other means of communication to understand the interests, needs and positions of all parties.

•The important thing is to create an enabling environment whereby the stakeholders are able to actively participate in the policy dialogues and subsequent planning and design, as well as to be capable of entering into and carrying out an agreement.

•Successful stakeholder engagement and, hence, conflict resolution can take place only if stakeholders and, in general, inhabitants of touristic areas in need of water sustainability have developed a clear understanding of the fact that natural water resources need to be preserved and used moderately.

MUTUAL GAIN FOR ALL PARTIES:

•If some parties, by acting unilaterally can enjoy greater benefits, will neglect the need for water efficiency and the commitments they made in stakeholder participatory schemes. Hence, to promote water sustainability in tourism whilst avoiding conflicts, it is important to understand the financial incentives of stakeholders.

•The key to successful conflict resolution is to convince all parties that they will be better off through cooperative action.

•All interested parties should have the opportunity to participate in the process.

•To find out which approach leads to mutual gain, it is important, in working towards consensus, to identify interests or common positions rather than positions.

EFFICIENT MONITORING

•Another prerequisite for the successful prevention and resolution of conflicts is the implementation of an efficient monitoring process of the implementation of policy measures.

•Efficient monitoring depends on setting specific objectives, i.e. defining realistic aims and conditions for the implementation of measures.

•The more parties participate in the monitoring process of policy implementation, the better.

•Joint monitoring can contribute towards a more effective monitoring process:

- oThe promotion and support of joint monitoring of activities, involving collaborative schemes of the parties, will enable the planning of the collection, analysis and use management of information concerning joint investments.
- oJoint monitoring supports ownership and mutual accountability of the management systems and builds on the development of common responsibility.
- oJoint monitoring generates information about whether or not development is being achieved through a joint investment and therefore supports results-oriented management approaches.

SPECIALISED MECHANISMS

•Successful conflict resolution depends on the development of mechanisms that specialise in dispute management.

•Specialised mechanisms can remove a potential source of conflict, prevent its escalation into a dispute, and find the way back to a constructive cooperative and a potentially productive future working relationship.

•Alternative dispute resolution refers to a set of approaches and techniques aimed at resolving disputes in a non-confrontational way. It covers a broad range of approaches with the simplest form to take the party-to-party engagement in negotiations, as the most direct way to reach a mutually accepted resolution, to mediation at the other end, where an external party imposes a solution.

•For water management issues, the tendency is to use *interest-based negotiation and mediation*, equitable and reasonable use of water and to reach an agreement where the parties will jointly manage the shared water resources. Examples: Water Allocation System (WAS) model and its multiyear extension (MYWAS) (see its application in the Jordan river valley here).

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ACTIVITY A3.8

TOOLKIT PART 3 – MODULE 5

COMPARATIVE POLICY ANALYSIS RECOMMENDATIONS

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CASTWATER MODULES: OVERVIEW

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CASTWATER research revealed that there are four main types of policy interventions aiming to address the issue of water efficiency in tourism:

- A) Cooperation improvement & conflict management:
- B) Integrated planning:
- C) Infrastructure development:
- D) Incentives and public awareness:

This module covers types B, C & D.

INTEGRATED PLANNING: OVERVIEW

The three distinct types of planning currently regulating water management in tourism are:

- The implementation of the EU Water Framework Directive in CASTWATER regions.
- Policies dictating water management on the national and regional level.
- The national framework defining monitoring mechanisms for water management.

INTEGRATED PLANNING: WATER FRAMEWORK DIRECTIVE IMPLEMENTATION

- The first regulatory framework area affecting tourism water management is the implementation of the EU Water Framework Directive 2000/60/EC (WFD hereafter) in CASTWATER regions.
- WFD aims to achieve 'good status' for all EU waters, including fresh, transitional (river mouths) and coastal waters.
- It is currently in its second cycle (2016-2020).
- The WFD is complemented by a number of other EU laws governing specific aspects of water policy, which all contribute to achieving good status.
- WFD is implemented in EU regions per river basin, and the River Basin Management Plan serves as the framework of all relevant measures for effective water management.
- All partners' regions reported the existence of RBMPs for their territories.

INTEGRATED PLANNING: NATIONAL/REGIONAL FRAMEWORKS & MONITORING

National/regional policies accompany WFD in each country:

- These policies complement the WFD with substantial environmental, energy-saving, circular economy measures relating to tourist activities.
- CASTWATER partners described at least 1 complementary measure of national/regional importance relating to tourism water management.
- The landscape of water resource management policies is fragmented without a unified approach.

Monitoring framework:

- Advanced water information systems assist with sustainable water policy management by effectively processing and accurately representing various data
- EU Mediterranean countries have adequate water consumption monitoring systems.
- The key policies on water information and data focus on strengthening these systems.
- Lack of a monitoring system specifically designed for tourist activities, collecting information on tourism water consumption.

INFRASTRUCTURE DEVELOPMENT : OVERVIEW

Water management infrastructure amelioration facilitates the productive use of water, securing sustainable resource management.

Not all regions have the same needs and priorities in infrastructure development.

Common types of water supply infrastructure development:

a) Material solutions, such as extending the water supply network

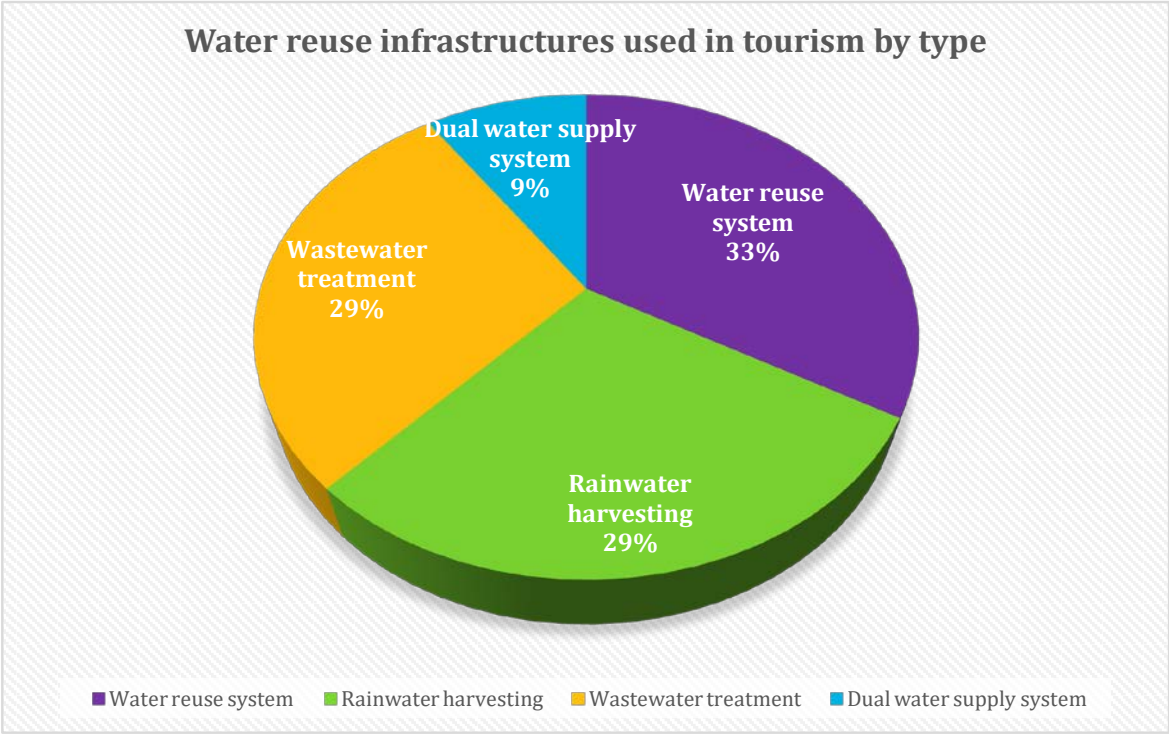
b) Efficiency improvements, such as implementing options for managing demand, reallocating water among users to reduce projected gaps and meeting future needs

c) Integration of leakages' identification systems

d) Implementation of water efficiency assessment systems.

INFRASTRUCTURE DEVELOPMENT : WATER REUSE SOLUTIONS

Water reuse constitutes a key way to increase water efficiency in the tourism sector



INCENTIVES AND PUBLIC AWARENESS

The third type of proactive policy intervention is the formation of incentivisation and awareness raising mechanisms.

Data results show that all partners have incentives as well as public awareness campaigns in place.

- Investment in the management of water resources through education and training is widely recognised as one of the key engines for sustainable growth and social cohesion.
- Incentives to individual water users: These actions target the individual water users (e.g. seasonal price fixing for domestic use in Herault, FR).
- Incentives to businesses: these actions target businesses (e.g. eco-labelling schemes that include water conservation measures in Malta).

RECOMMENDATIONS: INTEGRATED PLANNING (1)

- Create a comprehensive water management policy which addresses and regulates water management in tourist activities.
- Integrate and harmonise water management policies existing dispersed among various environmental, tourism, energy or other policy frameworks.
- Strengthen existing water management policies in tourism areas by specifically addressing water conservation in the tourism sector.
- Develop a common vision for both sustainable tourism and sustainable management of water resources.
- Promote cross-sectoral tourism water management approaches in a mixed urban scenario.
- Promote innovative intersectoral approaches to water management addressing recent trends in the tourism sector.
- Comprehensive and cross-sectoral approaches to water management should be developed side by side and be equally promoted.

RECOMMENDATIONS: INTEGRATED PLANNING (2)

- Integrate financial recovery of measures and fiscal viability as a prerequisite in the policy framework, to sustainably develop water conservation in tourism.
- Address institutional problems through clear definition of responsibilities for efficiently tackling water management in tourist activities.
- Establish a regional management plan for water management in the tourism sector, targeting especially areas with high volume of tourist activity.
- Create a regional data collection system for monitoring tourist activities' water demand.
- Promote the incorporation of water conservation indicators and sustainable water management in national/regional eco-labelling schemes.
- Promote agreements between tourist facilities and public authorities for sustainable water management.

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RECOMMENDATIONS: INFRASTRUCTURE DEVELOPMENT

- Introduce water reuse infrastructure in tourist facilities.
- Create alternative water systems for tourism infrastructures.
- Promote innovative solutions in water infrastructure by involving R&D stakeholders.
- Innovate on water reserve management by creating a water reserve network.
- Modernise water infrastructure in tourism facilities.

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RECOMMENDATIONS: INCENTIVES & PUBLIC AWARENESS RECOMMENDATIONS

- Develop layered pricing mechanisms encouraging water conservation in the tourism sector.
- Promote good practice guides through tourism associations.
- Finance water conservation projects in tourist facilities.
- Strengthen awareness campaigns for citizens and tourists alike.
- Promote better water management of public spaces to public authorities.
- Introduction of training facilities, training sessions, and education around water use and re-use.
- Provide incentives to tourist facilities employees to be trained in water conservation methods.

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ACTIVITY A3.8

TOOLKIT PART 3 – MODULE 6

THE CASTWATER ONLINE TOOL

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THE CASTWATER ONLINE TOOL: RATIONALE

•To develop successful policies and improve water efficiency in tourism, it is necessary to understand the perspectives of tourism businesses and SMEs.

•By collecting answers from tourism SMEs, the CASTWATER online tool:

- Allows tourism SMEs in the Mediterranean to understand, compare (with other SMEs), assess and rate their performance on water efficiency & water management.
- Offers tourism SMEs the opportunity to evaluate the policy measures and the condition of water sustainability in general in their territory.

•The online tool can be utilised by public authorities for the following reasons:

- Enable public authorities to understand the management of water resources by tourism SMEs, as described by the latter.
- Enable public authorities to understand how tourism SMEs evaluate their policies.

•The online tool can be found here.

THE CASTWATER ONLINE TOOL: DESCRIPTION

- ✓ The CASTWATER online tool is based on a system of questions that help estimate the values of two different types of indicators:
  - The 1st indicator type is intended for tourism SMEs' self-assessment
  - The 2nd indicator type is intended for the evaluation of public authorities' policies by tourism SMEs.

- ✓ Using the values of indicators, public authorities can quickly develop an understanding of the views of tourism SMEs with regards to water efficiency measures and policies.

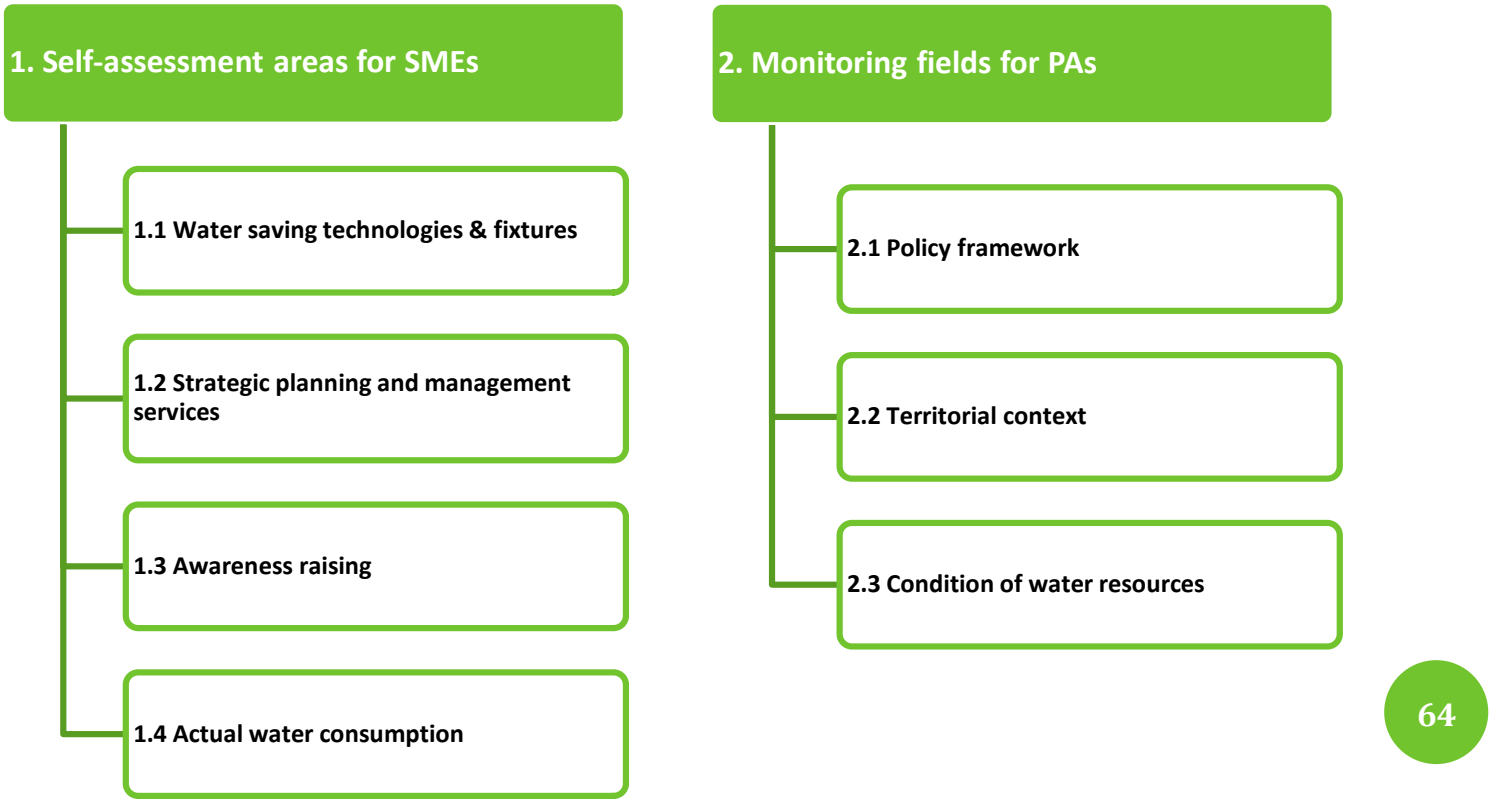
- ✓ To minimise the risk for a high dropout rate, the tool requires information (i.e. replies) that is already available in the company or easy to find.

- ✓ The values of indicators intended for tourism SMEs' self-assessment are automatically displayed in the online tool, enabling thus the grading of SMEs' performance in promoting water efficiency

- ✓ The values of indicators intended for the evaluation of public authorities' policies can be made available upon request during the analysis stage (as aggregate statistics) to help them derive useful conclusions about sector's overall performance.

THE CASTWATER ONLINE TOOL: INDICATOR CATEGORIES

✓ The two types of indicators (SMEs' self-assessment & public authorities' policies by tourism SMEs) can be further divided in thematic aggregations, as follows:



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SELF-ASSESSMENT AREAS: WATER SAVING TECHNOLOGIES & FIXTURES

- By checking the values of the indicators below, public authorities can receive information about the real rate of adoption of water saving technologies and fixtures by tourism SMEs.
- This information can then be used to improve measures developed to support the proliferation of such technologies and fixtures.

Code	Indicator	Indicator description	Measurement unit
S1	Annual budget for investments in sustainable water management	This indicator will measure the total amount of money (expressed as percentage of annual budget) invested by tourism establishments in water efficiency measures	Comparison between a) annual budget used for investments in sustainable water technologies & fixtures, and b) total annual budget
S2	Adoption of water saving devices and fixtures	This indicator will measure tourism SMEs' investment in water saving devices and fixtures, seeking to decrease water consumption in a passive way.	Score depending on how many different types of water management devices and/or fixtures the tourism SME has applied to improve water efficiency.
S3	Installation of water recycling systems	This indicator will evaluate the measures adopted by tourism SMEs to increase water availability (i.e. supply).	Score depending on how many different types of non-conventional water resources/water recycling technologies the tourism SME has utilised to improve water efficiency.
S4	Deployment of water efficient irrigation technologies	This indicator will measure the diffusion levels of various smart irrigation technologies among tourism SMEs, as a means to optimise water usage for gardening purposes.	Score depending on how many different types of efficient water irrigation technologies have already been applied by the tourism SME and compilation of these data from all respondent SMEs

SELF-ASSESSMENT AREAS: STRATEGIC PLANNING AND MANAGEMENT

- By checking the values of the indicators below, public authorities can receive information about the proliferation of efficient water management systems in the Mediterranean,
- Public authorities can use this input to promote efficient management of the use of water resources by tourism SMEs in their territory.

Code	Indicator	Indicator description	Measurement unit
S5	Implementing environmental management systems (EMS)	This indicator will reveal whether tourism SMEs apply environmental management systems to achieve their sustainability goals.	Positive or negative assessment depending on whether or not the tourism SME has applied a specific environmental management system
S6	Fostering strategic planning for sustainable water management	This indicator will evaluate tourism SMEs' strategic planning to promote sustainable water management.	Score depending on how many different actions the tourism SME has already taken to improve its water management planning
S7	Performing water management services	This indicator will evaluate tourism SMEs' course of actions to further promote sustainable water management.	Score depending on how many different water management services have already been applied by the tourism SME
S8	Monitoring water consumption	This indicator will assess the number of methods employed by tourism SMEs for monitoring water consumption across all business facilities.	Score depending on how many different monitoring water consumption methods have already been applied by the tourism SME and compilation of these data from respondent SMEs

SELF-ASSESSMENT AREAS: AWARENESS RAISING

- By checking the values of the indicators below, public authorities will benefit from the SMEs' input by being able to develop appropriate awareness raising campaigns and incentives to induce the adoption of training and awareness raising processes by tourism SMEs.

Code	Indicator	Indicator description	Measurement unit
S9	Training staff	This indicator will evaluate tourism SMEs' efforts to train staff on how to perform sustainable water management processes.	Score depending on how many aspects of efficient training of their employees have been already applied by the tourism SME
S10	Engaging customers on water sustainability	This indicator will measure tourism SMEs' performance in raising customers' environmental awareness and engaging them on sustainable water management practices.	Score depending on how many aspects of efficient awareness raising of tourists have been already applied by the tourism SME and compilation of these data from all respondent SMEs

SELF-ASSESSMENT AREAS: ACTUAL WATER CONSUMPTION

- By checking the values of the indicators below, public authorities can receive information about the extent of pressure placed on water resources by tourism SMEs in their territories and how it compares with the tourism industry as a whole and with domestic water consumption.

Code	Indicator	Indicator description	Measurement unit
S11	Actual water consumption	The indicator will demonstrate whether user's actual water consumption is above or below the tourism sector's average* (at national level)	Comparison between a) water consumption per tourist per day in the SME, and b) domestic/visitor average water consumption (tourist consumption per day corresponds to the consumption of water per visitor nights which are derived from information on international arrivals and average length of stay as provided by Gössling et al. [2000], as quoted by Becken [2014])
S12	Wastewater treatment	The indicator will estimate the relative amount of wastewater receiving treatment	Percentage of wastewater receiving treatment compared to actual water consumption within each SME.

MONITORING FIELDS: POLICY FRAMEWORK

- By checking the values of the indicators below, public authorities will receive the subjective feedback about how tourism SMEs value their policies and the efficiency of their implementation. Receiving data about the views of tourism SMEs and understanding them is a crucial component of contemporary policy making, since successful policies can only be developed via collaborating with the private sector.

Code	Indicator	Indicator description	Measurement unit
PA1	Effectiveness of water management policies	This indicator will measure the effectiveness of policies and instruments related to water management in the tourism sector	Average rank depending on the SMEs' opinion about how well have been implemented several types of policy measures for the promotion of water sustainability.
PA2	Frequency of water quality controls	The indicator will measure the frequency of water quality controls, seeking to evaluate the effectiveness of control policies effectuated by public authorities.	Average time interval between water quality controls conducted at the SME level.

MONITORING FIELDS: TERRITORIAL CONTEXT

- By checking the values of the indicators below, public authorities will monitor the subjective experience of tourism SMEs with regards to the impact of the various political, economic, socio-cultural , technological, environmental and legal factors on water sustainability in tourism.

Code	Indicator	Indicator description	Measurement unit
PA3	Potential for sustainable water management at regional level	This indicator will evaluate the surrounding environment underlying the adoption of water efficiency measures in the tourism industry for partnership areas.	Rank composed by the evaluation of the efficiency of various types of policy measures aimed at promoting water sustainability in tourism
PA4	Percentage of tourism SMEs connected to wastewater treatment facilities	The indicator will indicate how many tourism SMEs are connected to or have developed facilities that allow them to treat their wastewater	Number of tourism SMEs that are connected to or have developed facilities that allow them to treat their wastewater
PA5	Percentage of tourism SMEs providing sustainable tourism services (e.g. ecotourism)	This indicator will reveal the diffusion of sustainable tourism models (e.g. ecotourism) in Mediterranean tourism destinations.	Number of tourism SMEs that include or not sustainable tourism services in tourism packages/itineraries
PA6	Tourism industry's consumption compared to residential consumption	The indicator will enable to compare tourism sector's average consumption (expressed as consumption per visitor day) with the consumption of local residents/total water consumption during the different touristic seasons	Volume of water consumed per tourist per night / Volume of water consumed per inhabitant per day or average total water consumption per capita per day.

MONITORING FIELDS: CONDITION OF WATER RESOURCES

- By checking the values of the indicators below, public authorities can manage to embed the perspectives of tourism SMEs in their plans to improve water quality and sustainability.

Code	Indicator	Indicator description	Measurement unit
PA7	Dependence of the tourism sector on alternative water resources	This indicator will measure tourism SMEs' capability to increase the availability of water (thus meeting increasing water demand) via multiple sources.	Number of tourism SMEs utilising various non conventional water resources compared to total number of tourism SMEs
PA8	Quality of water resources utilised in the tourism industry	This indicator will evaluate the quality of water resources utilised by tourism SMEs for drinking, bathing and recreation purposes.	Rank composed by the scores tourism SMEs give to the quality of water consumed in different uses of water within the tourism SMEs (e.g. drinking, bathing)
PA9	Frequency of complaints / reports on water quality and water related diseases	This indicator will measure the frequency of customers' complaints about water quality or/and diseases caused by microorganisms and toxic contaminants in water	Average number of complaints compared to total number of guests

13 Annex 3: Cases with Best Practices

Toolkit Part 4: CASTWATER cases with best practices

Project co-financed by the European Regional Development Fund

PROJECT CASTWATER

D3.8.1 Learning and knowledge resources on sustainable tourism water management for Pas

Best Practices

Project Activity: A3.8
Date: 30/01/2018
Author: MRDDF

PROJECT CASTWATER

D3.8.1 Learning and knowledge resources on sustainable tourism water management for Pas

Camp Lanterna

Multifaceted approach with aspects of many best practices (Croatia)

The Lanterna Camping Resort is an eco-friendly family resort situated opposite the town of Krk, part of the Camping Adriatic of the Valamar Group. With a modern family orientation, this camp site is located amidst the well-preserved Mediterranean greenery of the Lanterna peninsula on the western Istrian coast between the fishing town of Novigrad and the tourist resort Porec. The Adriatic Camping comprises several campsites in one.

The company recognises all the aspects of sustainable environmental management, and pays particular attention to complying with legal requirements and environmental standards. Company's focus revolves around a) preventing soil and air pollution prevention, b) promoting the rational use of natural resources, c) reducing waste generation and promoting recycling, and d) training staff to apply sustainable practices and handle potential hazardous situations. The campsite includes a new Campsite Piazza with shops, restaurants, bakeries, grocery stores, children's playground and event area, indoor family entertainment zone with theatre and cinema and also a dedicated teenager area with game lounge. It also features a large aqua park and heated pools.

Sustainability Strategy

The resort boasts of its environmental preservation and sustainability approach to natural resources, protection of the Adriatic Sea, energy saving, management of waste and awareness raising on environmental issues among guests, employees and suppliers. The resort functions under an umbrella programme called "Green Valamar", which includes energy efficiency projects and various environmental protection initiatives, in the context of everyday operations and awareness-raising activities among guests, employees and the local community that focus on the preservation of the Adriatic coast and sea. There are recognised appliances and fixtures can improve facilities' water efficiency in a passive way (without requiring behavioural change), requiring only installation and commissioning. As measured by keys, 80% of the campsite resorts and 63% of the hotel and resort keys are ISO 14001 certified, while 58% of hotel and resort keys boast a TraveLife certificate confirming commitment to managing quality and processes according to international standards, as well as managing environmental impact and preserving natural resources.

Water Management

The campsite's water conservation policy is mainly focused on the use of water efficient fixtures, regular maintenance of water infrastructures, raising customers' awareness on sustainable water consumption and greywater reuse. Relevant initiatives include: a) monitoring and benchmarking water consumption, b) the installation or retrofitting of low-flow showerheads or pressure regulators, and c) the installation of sensors or timers to control faucets and showers, low-flush and dual-flush toilets. The use of rainwater or pool water for toilet flushing is used to minimise the waste water. The same use of low-flow high pressure spray valves and efficient dishwashers with water reuse enables water saving. Moreover, the pools of the site are optimised by back washing operations; the use of pool covers during closing hours; and maintaining appropriate temperature to reduce chemical consumption. Often, water efficient irrigation technologies have been designed to promote water conservation in businesses' gardens and landscapes, using smart control systems and environmental sensors that can diminish water consumption for gardening and watering plants. To facilitate irrigation the camping resort has created green areas with indigenous species and maintained an efficient irrigation system, which makes use of greywater and waste water. Lastly, efficient washing machines have been purchased with the use of green procurement.

Type of establishment: Campsite
Place: Istria, Croatia
Main strategy: Multifaceted approach
Cost: 1.082.000 €
Time of implementation: 2016 - now

Results

The project is expected to decrease the amount of water consumed across all departments/areas by 65,000 m2 per year. The investment was partly was funded by the EU Cohesion Funds Water Co-Financing Framework. This investment is expected to bring significant environmental and social impacts; extending and upgrading wastewater collection networks, which are likely to be site-specific and readily identified and subsequently addressed through adequate mitigation measures. As a result of the Corporate Social Responsibility Index competition organized by the Croatian Sustainable Development Business Council (HR PSOR) and the Croatian Chamber of Commerce (HGK), Valamar Riviera d.d. won the Corporate Social Responsibility Index Award for responsible environmental management policies and practices. The recognition came by systematic review, which encompassed the compilation of detailed reports on energy and water consumption, waste management (with specific measures to save resources and reduce the quantity of waste), and care for employees and the local community.

Conclusions

The Camping Lanterna (www.camping-adriatic.com/lanterna-camp-porec) managed to upgrade its services and systems through a large investment project started in 2016, and which has also led to be awarded as the Best Campsite in Croatia (2016). Additionally, it received the INOVACAMP 2016 recognition for its innovative concepts. As one of the leading camping resorts in the area, they bring additional corporate responsibility to preserve the natural environment of Istria, which is region's main growth factor. For this reason, sustainability was found at the core of the business after the restructure of facilities in 2016, when the business group and camping resort has taken a number of initiatives towards the improvement of environmental protection and sustainable development. Another aspect of the investment is that two other enterprises are interested in implementing a similar project, in an effort to decrease water consumption and contribute to resource efficiency. They are particularly interested in deploying a greywater reuse system that will allow to recycle water for irrigation purposes.

Louis Ledra Beach Hotel

Multifaceted approach with aspects of many best practices (Cyprus)

The Louis Ledra Beach Hotel is situated on the beachfront overlooking the Paphos coast and the clear Mediterranean waters. The hotel is equally valued by both couples and families, offering high quality service and amenities for relaxation and entertainment. It combines quiet, relaxing and cosy environment with a very friendly atmosphere. The hotel features spacious rooms and suites; leisure facilities, including four swimming pools; namely a heated indoor pool, an outdoor pool, a children's pool and an adult-only outdoor pool. Facilities also include a kid's club, a daily animation program, a spa with jetted tubs, and a sauna, as well as massage facilities. The hotel is only a 5-minute drive from the town centre and 11km from Paphos International Airport. The Louis Ledra Beach Hotel is member of the Louis Group, which is one of the leading travel, cruising and hotel groups in the Mediterranean with over 75 years of experience.

Type of establishment: Hotel
Place: Paphos, Cyprus
Main strategy: Multifaceted approach
Cost: N/A
Time of implementation: 2010 - now

Sustainability Strategy

The Louis Ledra Beach Hotel is committed to implementing proactive measures to help protect and sustain the natural environment. The hotel, acknowledging the impact of its activities on the environment, strives to minimise negative environmental footprints by employing green technologies and sustainable management practices. Overall, the hotel has developed a comprehensive environmental strategy to make a cleaner and safer environment for its visitors, whilst ensuring environmental issues will remain a focal point for the entire community in Cyprus. To deliver its commitment, the company will:

- **Comply** with the relevant environmental legislation & take a proactive approach to future requirements & obligation
- **Conserve** natural resources through the responsible use of energy, water and materials but also maintaining the quality of service expected by guests.
- **Monitor** environmental performance for continued improvement by reducing, re-using and recycling in areas such as energy consumption, reduction of waste materials and water usage.
- **Work** with suppliers that have adopted environmentally friendly policies, delivering sustainable products and services.
- **Engage** all staff into sustainability and conservation activities but also communicating to guests the efforts made by the hotel so as to bring a behavioural change towards greener practices.

Water management

The Louis Ledra Beach Hotel (https://louisledrabeach.com) does not care only for guests' comfort and safety but also incorporates water saving procedures and water efficient devices to minimise overall water consumption, especially during summer months. Up to now, the hotel has undertaken the following water saving initiatives:

- Toilets equipped with low flush buttons.
- Hot water is constantly circulated to have instant hot water at the sinks.
- Public swimming pool showers are equipped with push buttons to control the duration of water flow.
- Beach towels are changed every 3 days to save laundry water (flexible if needing earlier replacement).
- Guests are encouraged to reuse their bath towels and save water.
- Public area showers work with push buttons for up to 15 seconds.
- Gardens around the hotel's public areas are moderately watered, as per hotel's 'Weekly Irrigation Plan', so as to avoid unnecessary water wastage. The plan is strictly followed by the hotel's gardeners' team and exceptions may apply during rainy periods.

Results

Hotel's water conservation initiatives were driven by the need to improve resource efficiency, increase its market share and preserve the environment. Evidence shows that the hotel reached most of its objectives, producing tangible and measurable benefits for the company. More particularly, the adoption of water efficiency measures reduced the overall water consumption by 7%. The water consumption in 2014 was 269 litres per guest night while the water consumption in 2015 was decreased to 252 litres. In 2016, the average consumption was slightly increased (to 268 litres), however this can be attributed to the increased number of visitors and occupied nights. Overall, the hotel managed to expand its customer base, attracting a new group of tourism that are particularly concerned about environmental protection and resource efficiency. Actually, the number of visitors has been increased by 8%, following the implementation of sustainability measures. Furthermore, the hotel achieved a clients' satisfaction score equal to 90%, stemming from better service quality and compliance with sustainability principles. The Louis Ledra Beach Hotel is currently rated with 4.5 in TripAdvisor and with 7.3 in Booking. What is more, the hotel has been honoured with the "TraveLife Gold Award" for its sustainability policy and green practices.

Conclusions

The implementation of water efficiency measures did not go without problems. The hotel faced difficulties in funding the purchase of water efficient fixtures and technologies. There was an initial doubt about the financial viability of such an investments. Finally, the company managed to cover all the costs by own capitals considering that the benefits will be manifold in the long term. What helped to overcome these shortcomings was staff competence to perform water management procedures and use water efficiency technologies and the fact that sustainability is at the core of business strategy. This practice demonstrates high transferability potential as the needs addressed are common among tourism SMEs across MED area, and the aforementioned measures do not entail significant implementation risks nor organisational resistance.

Camping La Petite Motte

Best practice: Rainwater harvesting (France)

The Campsite "La Petite Motte" is located at the heart of Mediterranean in La Grande Motte (Herault), between Montpellier, Sète and Arles, Grau du Roi and Palavas, 600 meters from a long sandy beach. The campsite is open from April to September, with maximum capacity of 700 persons. It offers 200 camping pitches and 16 mobile homes. Each tent has a fridge, and access to a communal bathroom with a shower. There are plenty of green areas, BBQ facilities, a bar and a games room including a billiards table. "La Petite Motte" offers a car rental, laundry and currency exchange service. Free Wi-Fi access is available in all public areas.

Sustainability Strategy

The tourism industry put enormous pressure on the coastal zone during the summer period, leading to impacts such as soil degradation, water and air pollution, resource scarcity, and biodiversity loss. The consumption of water resources for hotels, campsites, swimming pools and tourisms' personal use has resulted in water shortages and degradation of water supplies, setting a major threat to local community. In this context, the campsite appears strongly committed to promote resource efficiency and environmental sustainability. Campsite's initiatives include energy saving measures to decrease greenhouse gas emissions and stimulate the use of renewable energy sources, water resource conservation, sustainable waste management and territorial valorisation. Indicative measures are: a) recycling materials and products, b) using an automatic irrigation system, c) energy efficient lamps, d) cleaning up the beach and the surrounding parks, and e) engaging guests in resource conservation activities.

WATER MANAGEMENT

In 2008, the campsite (www.camping-lapetitemotte.com) installed a harvesting system to collect the rainwater from roofs and impervious surfaces such as parking lots, garden areas and leisure facilities, seeking to reduce the consumption of groundwater. The total surface covered by the system is approximately 300m2. This project was funded by the Languedoc Roussillon Regional Council under the call "Sustainable management to save and protect water resources". The process includes collecting the rainwater from campsites' roofs and surfaces. The rainwater is then filtered to eliminate debris and contaminants and is stored in two holding tanks, so as to be reused for toilet flushing, laundry and gardens. Overall, the rainwater recycling system contains the following components/elements:

Two bladders tanks to store the water collected from roof or other surfaces; namely a 40m3 tank for water to be used for toilet flushing and a 80m3 bladder tank for storing water to be used in laundries and gardens, and as a back-up for sanitary facilities.

- A **control unit** to monitor the water level in holding tanks
- A **filtering system** to prevent the introduction of debris (such as leaves and dirt) into the water tanks
- A separate **pipe system** to connect the harvested water supply with sanitary facilities and laundries.
- A **backup water supply** for cases the water rank runs dry

Type of establishment: Camping
Place: La Grande Motte, France
Main strategy: Rainwater harvesting
Cost: 42,000€
Time of implementation: 2008 - now

Results

This good practice demonstrates the ability to conserve water resources via rainwater harvesting. The rainwater harvesting system provides several advantages such as decreasing the demand for underground water, reducing water bills, and promoting resource efficiency. Evidence shows that the system helped the campsite to reduce the consumption of groundwater resources by 15%. This figure would be greater if the annual rainfall volume was higher and there were not some technical failures/hitches. Furthermore, this practice has yielded substantial financial savings for the campsite (up to €6,000 per year), stemming mainly from the lower water bills and maintenance costs. The campsite is currently rated with 3.5 in TripAdvisor, with 7.8 in eurocampings.de and with 7.3 in campingcard.at.

Problems and challenges

The campsite encountered some technical problems during the design and maintenance of the rainwater harvesting system. The first one was related to the appropriate choice of storage volume. Experience shows that the scaling should be determined according to the minimum monthly rainfall statistics, and not at an annual basis, considering that the area can suffer a three months rain drought during the summer period. As regards the maintenance of installations, all filters should be cleaned regularly to prevent debris from entering the storage tanks. This need becomes even greater if the facilities are located near green areas (e.g. gardens, parks) where there are abundant quantities of pollen and particles (especially during spring) that can clog the filters.

Conclusions

The key enablers behind the success of this practice was company's commitment to promoting resource efficiency and preserving the environment, as well as the support provided by public authorities in the form of direct funding. As mentioned above, the installation was partly financed (80%) by the Languedoc Roussillon Regional Council under the call "Sustainable management to save and protect water resources". This type of support (i.e. direct funding) was necessary to make the business case for such an investment. A rainwater harvesting system incurs initial high costs that can be covered in 10-15 years, which again depends on the amount of rainfall and system's technology level. The system can be easily installed in any tourism establishment, demonstrating high transferability potential. Nevertheless, tourism enterprises should take into account a number of factors before investing in rainwater harvesting such as rainfall volume in the region, topographic location, tanks' proximity to green areas, roof surface for water collection, and type of technology.

Grecotel Lakopetra Beach

Best practice: Creating a water management plan (Greece)

Grecotel Lakopetra Beach is a four star hotel and bungalow complex, which offers many social and recreational activities. The hotel provides all inclusive facilities, thus making it ideal for families, sports enthusiasts, and for those seeking rest and relaxation. Located only 35 minutes west of the seaport of Patras, the hotel is built in splendid gardens (80.000m2) and situated alongside a sandy beach facing the Ionian Sea. This holiday resort blends into the unspoiled natural landscape and has a commanding view of the entire southern coast of the Greek mainland. The hotel offers a large selection of on-site facilities to suit everyone including sports, water sports entertainment and other recreational activities; most of them free of charge. To conclude, Grecotel takes pride in its continuing effort and commitment to creating sustainable environments of extraordinary beauty.

Type of establishment: Hotel
Place: Lakopetra, Greece
Main strategy: Water management plan
Cost: N/A
Time of implementation: 2012 - now

Sustainability Strategy

Grecotel is strongly committed to promote environmental protection and sustainability. Grecotel became the first Mediterranean hotel group to undertake eco-audits in its hotels according to EU standards (in 1992). To this end, the company has developed a long-term sustainability plan (applicable to all hotels) to reduce hotels' environmental footprint and improve the quality of the surrounding area, which is considered the company's main asset and competitive advantage. Grecotel environmental policy includes:

- Setting realistic environmental targets based on local conditions and development priorities
- Promoting the sustainable consumption of natural resources
- Employing sustainable waste management practices
- Prioritising the use of recycled and biodegradable materials
- Using resource efficient products such as low energy light bulbs and water efficient irrigation systems
- Conserving the natural landscape, biodiversity and cultural heritage
- Raising public awareness on environmental issues (incl. staff, hotel guests, business partner, and local community)
- Integrating environmental considerations in all new building and renovation plans

WATER MANAGEMENT

This good practice concentrates on the development of a comprehensive water conservation plan to promote resource efficiency at Grecotel Lakopetra Beach (www.lakopetrabeach.com). The company's main purpose has been to decrease water consumption during the summer months, when the demand for water reaches its peak. The conservation plan prescribes an array of measures to be adopted for optimising water consumption across all hotel's facilities. Up to now, the hotel has implemented the following water efficient measures, as described in the plan.

- Audit for **reporting the current water uses** and flows across all facilities
- **Water efficient fixtures** in all guestrooms and common space. These include low flow showerheads (10 litres per minute maximum flow), faucet aerators (max. 6 litres per minute), flow restrictors, and low flow toilets (6 litres per flush).
- Regular **inspection of plumbing infrastructures and water appliances** to identify leaks and proceed with the necessary repairing.
- **Automatic irrigation system** to deliver water when and where it is needed. The gardening takes place either early in the morning or late in the evening to avoid water loss due to evaporation.
- **Covering swimming pools** when not in use to prevent evaporation and backwashing every two or three days rather than a daily basis.

Results

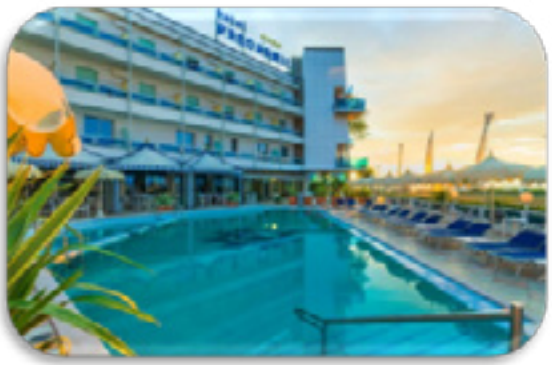
The adoption of the measures prescribed in the conservation plan has led to a significant reduction in water consumption. The hotel managed to cut down the average water consumption per guest night by 15%. According to guests' feedback and comments, the quality of services has been improved considerably while the hotel attains a clients' satisfaction score equal to 80%. In addition, Grecotel Lakopetra Beach has expanded its customer base by attracting a distinct group of visitors that are particularly focused on sustainable tourism. The hotel is currently rated with 4 out of 5 in TripAdvisor, and with 4.7 in Expedia. Finally, Grecotel Lakopetra Beach has been awarded with a number of certificates for its sustainability performance and quality of services, such as the "Gold Award 2014" and the "Certificate of Excellence" by TripAdvisor.

Conclusions

The main problem encountered during the implementation of measures was related to the lack of experience among employees in terms of identifying current water uses and measuring water consumption. This problem was resolved by contracting a field expert to carry out a water audit and assist with the development of the conservation plan. The factors recognised as key enablers for sustainable water management are a) the company's commitment to sustainability and environmental protection, b) the availability of staff with environmental culture, and c) customers' involvement in sustainability practices. This approach (i.e. water management plan) has been successfully replicated in almost all Grecotel hotels across Greece. Each water management plan focuses on hotels' individual needs and priorities, as drawn from water audits' findings.

Hotel Panoramic

Best practice: Home automation (Italy)



Type of establishment: Hotel
Place: Caorle, Italy
Main strategy: Home automation
Cost: N/A
Time of implementation: 2016

This case includes aspects of using water efficient fixtures and regular maintenance of water infrastructures. The Hotel Panoramic (www.hotelpanoramic.it) is situated in front of the Adriatic Sea, on a wonderful long sandy beach in Caorle, Venezia. Privileged by its seaside location, the hotel provides a unique opportunity to combine tranquillity, relaxation and culture. The Hotel Panoramic offers a wide choice of rooms, from standard doubles and superior rooms to junior and luxury suites. All rooms are designed for total comfort and are complemented by chic furniture and spacious balconies providing spectacular views across the Mediterranean Sea and the swimming pool. The restaurant, surrounded by a pine forest, offers local dishes as well as international food to accommodate for different tastes and cultures. The hotel also features a modern conference room on the ground floor. The room has capacity for a maximum of 40 people in theatre seating, and is ideal for business and social meetings.

SUSTAINABILITY STRATEGY

The hotel strives to minimise its environmental footprint by applying modern technologies and green management practices. The main purpose is to integrate environmental considerations into strategic planning. Hotel's environmental activities revolve around the following areas:

- *Resource efficiency*: This includes the installation of energy saving bulbs (e.g. LED) and light sensors in all rooms and common spaces, the deployment of innovative windows frames, ventilated wall and heat pumps, and the use of water efficient fixtures.
- *Recycling and waste management*: The main goal is to apply the waste hierarchy principles with a particular focus on prevention, reuse and recycling. Hotel's efforts include recycling batteries and electrical appliances, paper, aluminium, glass and plastic, and the disposal of liquid waste in the city's biological purification plant.
- *Natural environment*: Hotel's main advantage is its proximity to the beach and the surrounding environment. To this end, it has taken measures for the protection of the coastal and marine environment, as well as the preservation of the natural landscape.

Water Management

This good practice demonstrates the ability to diminish water consumption by deploying a home automation system that allows to monitor water usage by room, device and activity. In 2016, the Hotel Panoramic decided to install home automation systems in each floor (by 2017), seeking to increase its operational efficiency, ease maintenance and optimise energy & water consumption. The system has been designed to act as a leak-detection, prevention and alert system, as well as a water-conservation solution. It monitors the actual water consumption with sensors placed throughout the plumbing infrastructures, whilst providing the possibility to supply water only upon request by a water device. Furthermore, the system allows to measure water use per appliance and activity (e.g. bathing, laundry, and gardening), compare them to common practices and industry standards, and identify leaks and malfunctions when excessive consumptions are reported. Systematic monitoring and long-term data analysis can also help to identify consumption patterns, support the adoption of appropriate water efficient solutions and prioritise investments. In addition to the home automation system, the hotel made a decision to replace the old water appliances in guestrooms with more efficient ones to further promote water efficiency. This comprised the use of low flow showerheads, faucet aerators, flow restrictors, and dual-flush toilets.

Results

The home automation system has helped to optimise water consumption, yielding substantial financial savings and improving hotel's bottom line. The hotel achieved to cut down water consumption by 10% during the first year of application, while more ambitious targets have been set for the next season when the service will be available in all rooms. Besides, the system has the potential to create savings up to 30%. Additionally, the system increased clients' satisfaction, comfort and security and provide different security levels. Hotel Panoramic is currently rated with 8.4 by guests in Booking and with 4.6 with TripAdvisor, having received a series of positive acclaims for its water management practices.

Conclusions

The hotel did not encounter any significant problem prior and during the installation/operation of the home automation system. The investment was funded by own capitals while the hotel did not receive any type of support by public authorities. This particular practice shows high transferability potential as the benefits associated with the deployment of a home automation system for water efficiency outweigh investment costs by far, considering the short payback period and the extent of financial and environmental impact.

Hilton Malta

Best Practice: Greywater reuse (Malta)

Type of establishment: Hotel
Place: Malta
Main strategy: Sewage treatment plant
Cost: 120,000€
Time of implementation: 2010 - now

Hilton Malta is located in St. Julian's district, just 15 minutes away from UNESCO World Heritage Capital City Valletta. The Hilton Malta hotel comprises 413 luxurious rooms, all with private facilities, full amenities and a terrace or balcony overlooking either the breath-taking views of the Mediterranean or the award winning Portomaso yacht marina. The hotel features three restaurants and four bars, as well as various facilities for leisure and relaxation (e.g. outdoor swimming pools, paddle pools for kids, Jacuzzi and a private beach club). Hilton's fitness centre includes a well-equipped gymnasium, tennis & squash courts, sauna, steam room, and a dance studio. Furthermore, the hotel features a conference centre and 8 syndicate rooms accommodating up to 1330 delegates.

Sustainability Strategy

The hotel's environmental activity is part of Hilton's commitment to living sustainably, one of the four pillars of the company's global corporate responsibility strategy, which is called "Travel with Purpose". Hilton Malta has elaborated a sustainability strategy with measures to reach the sustainability objectives and targets set by the Hilton Group, in an effort to a) reduce energy and water consumption, b) promote waste prevention and recycling, c) diminish greenhouse gas emissions, and d) promote social inclusion and responsibility. Among others, Hilton Malta established a waste heat recovering unit. Typically, the warm water waste produced from cooling hotel chillers is disposed directly into the sea. Hilton Malta invested in a heat pump that uses the warm water as a heat source to pre-heat the hot water used by the hotel, which was previously done by gas-fired burners. After a full year of operation, the hotel managed to achieve a net energy reduction of 2,000,000 kWh, a CO2 reduction of 280 tonnes while the financial savings can reach €120,000 per annum. Other initiatives include:

- Automatic control for lighting
- Automatic control of heating and cooling
- Automatic chemical dosing
- Solar panels/screens to reduce indoor temperature
- Power factor correction to reduce electrical transmission losses
- Energy saving lamps (e.g. LED bulbs)
- Training programmes for staff
- Raising guests' awareness on environmental and water scarcity issues

WATER MANAGEMENT

This good practice centres on the aspects of hotel's water conservation activities that include the installation of a sewage treatment plant. In 2010, Malta Hilton established an underground treatment system (with a maximum capacity of 120 m3/day) to treat the hotel wastewater/effluent in a way that it can be used for non-potable purposes across all hotel's facilities. The procedure includes collecting/storing the sewage generated at hotel's facilities and removing all the contaminants (i.e. large solid waste and sludge) through a biological and chemical treatment process. The filtered treated effluent is dosed with chlorine for disinfection purposes, before making it available for reuse. Overall, the treated wastewater is totally disinfected and treated to the highest standards of applications, and hence safeguarded from any health hazard. The recycled wastewater is mainly used for landscape irrigation, toilet flushing and other washing purposes. In addition to the sewage treatment plant, the hotel has adopted a series of other water saving measures including:

- The construction of **two large water reservoirs** for collecting/storing rainwater from roofs & surfaces.
- The adoption of an efficient **irrigation system with sensors** that help to optimise water usage for gardening based on environmental conditions.
- The installation of **low-flow showerheads & faucets** and pressure regulators in bathrooms
- The use of **timers to control faucets** and showers in public areas (toilets and changing rooms)

Results

The installation of the sewage treatment plant has proven to be a success in reducing water generation. The plant produces over 70m3 of water daily, which is all used in irrigation and for toilet flushing, saving more than 5,000 cubic meters per year. Apart from enhancing hotel's brand and popularity, such an investment has resulted in lower first class water consumption bills and hence lower operational costs. The total water savings achieved by all means (e.g. rainwater harvesting, water efficient fixtures) amount to 30000m3 per year while the financial savings exceed €6,000. Hilton Malta is currently rated with 9 in Booking, with 4.5 in TripAdvisor and with 4.7 in Hotels.com, having also received very positive acclaims for its environmental activities and water efficiency measures. In addition, the hotel has been honoured with numerous international awards and certificates for its sustainability policy, such as the "ECO Certification by the Malta Tourism Authority", "EU Eco Label", and "Gold TraveLife Award".

Conclusions

What triggered the hotel to invest in wastewater treatment technologies, was the eventuality of higher water tariffs and the possible introduction of a sewage tax for tourism enterprises. The elements that can be as seen as success factors are a) the company's commitment to promote resource efficiency, b) the availability of competent staff to perform water management procedures and use water efficiency technologies, and c) the company's financial capacity to support such an investment. The company did not receive any type of support by public authorities and the entire cost was covered by the Hilton Group. This technology (i.e. sewage treatment) can be easily adopted by other tourism establishments in Mediterranean, as the payback period is relatively short (2-4) years, its operation does not require any specialised technical experience and the demonstrated achieved benefits outweigh investment costs by far.

La Manga Club Resort

Best practice: Using water efficient fixtures (Spain)

La Manga Club (https://lamangaclub.com) is an exclusive holiday, sports and leisure resort in the region of Murcia, 15 minutes from Cartagena. The resort is located in a privileged setting bordered by natural parks and unspoilt beaches to offer luxury, leisure and sport with wonderful weather all year round. Covering an area of 560 hectares, the resort provides guests with exclusive accommodation, first-class professional sports facilities and fine dining, ideal for those seeking exceptional tranquillity, security and privacy, coupled with superlative service. Established in 1972, La Manga Club has attracted thousands holidaymakers, athletes and professionals in its outstanding facilities, which are designed to the highest international standards. Overall, the resort comprises a five-star hotel, luxury apartments and 450 hectares of sports facilities, including three 18-hole golf courses, 28 tennis courses and eight soccer fields. It also offers countless leisure services, such as the La Manga Club Spa, conference facilities and more than 20 restaurants and bars.

Type of establishment: Hotel
Place: Cartagena, Spain
Main strategy: Efficient irrigation system
Cost: 1,000,000€
Time of implementation: 2006 - now

Sustainability Strategy

La Manga Club is leading the way towards environmental sustainability, having made substantial reductions in energy consumption and water usage. The resort has elaborated on an environmental management plan to promote resource efficiency and improve facilities' environmental performance, whilst retaining and enhancing the quality of amenities/services. The first action was to conduct an energy audit to analyse energy flows and find opportunities for diminishing energy expenses and carbon footprints. The results showed that there was an energy saving margin of nearly 25% without reducing the amount of energy used, while the adoption of sustainable water and waste management measures will make the resort a more environmentally responsible touristic destination. By implementing a series of energy-efficient measures, the resort managed to achieve considerable resource savings. Solar power now provides between 30 and 40 per cent of the energy required for hot water and the heating of the pool in the five-star Hotel La Manga Club Principe Felipe.

Water management

As part of its environmental management plan, the resort implemented a host of simple measures to promote water conservation, including:

- The introduction of **aerators** on taps, flow control and timer mechanisms in guest rooms.
- The installation and maintenance of an **efficient irrigation system** to optimise water usage for gardening based on environmental conditions. To achieve this, the company established its own weather station in the field to measure temperature, wind speed and humidity, coupled by an irrigation software that collects and analyses data on the different variables (e.g. temperature, wind speed, humidity) to determine when and how much to water.
- The **planting of green areas** (especially golf courses) with species that minimise irrigation requirements and are adjusted to areas' humidity level.
- The **valorisation of greywater and wastewater** for irrigation purposes. This water is provided by the waste water treatment plant located in Camposol.
- Organising **dissemination campaigns** to raise guests' awareness about sustainable water management and scarcity issues.

Results

The introduction of water efficient fixtures in guest rooms, such as aerators on taps, flow control and timer mechanisms, reduced water consumption in hotel's facilities by 60%. In addition, 70% of the water used in maintaining La Manga Club's three championship golf courses, eight international standard sports pitches and its numerous gardens is recycled water (in the form of greywater) provided by the waste water treatment plant in Camposol. The use of an efficient irrigation system based on environmental conditions and measurements on different variables has helped to optimise water consumption and create financial savings due to decreased water and energy bills. Furthermore, the resort has been granted several awards for its environmental performance and high quality services, such as "Best International Resort 2017", "Certificate of Excellence by TripAdvisor 2016", and "Top 5 Worldwide Golf Resorts 2014-2016".

Problems and challenges

Resort's environmental initiatives encountered difficulties that rose from the lack of financial resources to cover the entire investment cost which exceeded €1,000,000. To overcome financial problems, the company had to prioritise investments (e.g. the installation aerators on taps, flow control) that had a shorter return on investment (ROI) or else payback period, whilst engaging company's own staff into maintenance or installation works (rather that purchasing external construction services). This helped to save money from labour to be used for the purchase of water efficient plumbing equipment and the latest software for optimising irrigation activities.

Conclusions

The key factors behind the successful adoption and implementation of water efficiency measures was a) the fact that sustainability is at the core of business strategy, as demonstrated by the high investment cost, b) the availability of staff with environmental culture and competent to perform maintenance and installation works (see above) and c) the application of water efficiency technologies to optimise water consumption based on environmental and terrestrial conditions. This practice has not yet replicated, even though it demonstrated high transferability potential, considering that it is associated with considerable environmental and economic benefits and addresses needs that are common among tourism enterprises across the MED area.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