Project co-financed by the European Regional Development Fund

D3.6.1 Indicators List For the Evaluation of Tourism Water Management Efforts in Partnership Areas

Project Activity: A3.6

Document Version: 2.1

Date: 30/01/2018

Author: Emilia Romagna Region

Project acronym: CASTWATER

Project name: Coastal areas sustainable tourism water management in the Mediterranean

Project code: 1262

Document Information

Document Identification Name: 2018-01-30_CASTWATER_A3.6_D_IndicatorsList

Document title:

Indicators List for the Evaluation of Tourism Water Management Efforts in Partnership Area

Type: Deliverable

Date of Delivery: 30/01/2018

Activity: A3.6

Activity Leader: Emilia Romagna Region

Communication level: Restricted

Document History

Versions	Date	Changes	Type of change	Delivered by
Version 2.1	**30/01/2018**	**Initial Document**	**Inclusion of** partners' input	**Emilia Romagna Region**

Disclaimer

The information in this document is subject to change without notice.

Table of Contents

1 Executive summary

This document is the final deliverable of activity A3.6 of the CASTWATER project (i.e. D3.6.1) and includes the final list of indicators to be used for promoting, supporting and advancing water sustainability in the tourism sector of Mediterranean territories. The list of indicators will be utilised in further activities of the project so as to:

a) Prepare the deliverables of activities A3.7 (online self-assessment tool for tourism SMEs) and A3.8 (training resources for public authorities staff.
b) Conduct the training activities of the CASTWATER project.

The document starts by presenting the context of activity A3.6, i.e. the key rationale and characteristics of both the Interreg MED programme and the CASTWATER project (Sections 2 & 3). The Interreg MED programme is briefly presented alonside its rationale, i.e. to encourage innovative concepts and practices (technologies, governance, innovative services, etc.), the sensible use of resources (energy, water, maritime resources, etc.) and social integration through a combined and territorially based collaboration approach. The CASTWATER project is presented in detail. More precisely, the document focuses in a) the background of the project in the sense of understanding the need to improve water efficiency in tourism SMEs and businesses in general, b) CASTWATER's potential to contribute to European Union policies already in place, and c) the main goal of the project which is to provide means for supporting sustainable tourism water management and generating the dynamic involvement of public authorities, and the tourism sector as a whole. This section concludes with the presentation of the two key phases of CASTWATER, i.e. studying and testing, and the expected results of the project.

The next section of the document present the aims and process of completion of activity A3.6 that, as a studying activity, includes the stages of methodology preparation, data collection, and data analysis & final preparation of the deliverable (Section 4). After the description of the process of completion of the activity, the research questions used in the investigation are presented which are the following (Section 5):

1. Which are the proper water sustainability indicators to measure and evaluate water efficiency in the tourism sector in your region?
2. How can water sustainability indicators be used to measure and evaluate water efficiency in the tourism sector in your region?

To answer this question, the document continues with the presentation of the use of indicators in research and the argumentation that accompanies their use in the CASTWATER project (Section 6). It is argued that improving the sustainability of water in tourism is a process characterised by a high degree of complexity, affected by the actions of a multitude of different organisations and agents (tourism SMEs, tourists, public authorities…). To change the degree of water sustainability in the tourism sector, it is necessary to change the behaviour of many actors by taking into account their perspectives with regards to this issue. As a result, it is argued that a system of indicators specifically designed for tourism SMEs' self-assessment and monitoring by public authorities with regards to water sustainability could help answer the research questions for the following reasons:

a) Self-assessment can potentially lead to the development of an understanding of the views of tourism SMEs about water sustainability in tourism. If considered this understanding can help develop innovative and effective policy measures.
b) Indicators can have a simplifying effect, by presenting critical information in a simple way and thereby, have the potential to reduce the effects of the complexity of the process of improving water sustainability in tourism.

Following this argumentation, the document presents briefly the methodology of the research and the thematic and functional criteria for selection of indicators that were used in the research of A3.6 (Section 7). It is then followed by Section 8 with a brief presentation of the data collected by CASTWATER partners.

With Section 9, the document starts the complete presentation of the results of the research. The analysis of the data led to the production of a system of indicators that can be further categorised in the following types:

1. Indicators used as self-assessment areas for SMEs

    1.1 Water saving technologies & fixtures

    1.2 Strategic planning and management services

    1.3 Awareness raising

    1.4 Actual water consumption

2. Indicators used as monitoring fields for PAs

    2.1 Policy framework

2.2 Territorial context

2.3 Condition of water resources

As can be seen the data led to the formation of indicator categories capable of simplifying multiple facets of the complex process of improving water sustainability in tourism. Sections 10 to 16 are dedicated to the detailed presentation of each indicator category. Each of these sections describes and lists the indicators of each category and then explains how their values will be calculated and how these results will be used to assess and improve water sustainability in tourism, thereby providing the answer to both research questions.

The document concludes with four annexes delivering key information about the research of activity A3.6. More precisely:

1. Annex 1 presents the methodology that was followed to conduct the data collection. The annex presents all the key aspects of the methodology, including key definitions, methodology description, outlining of data collection methods, potential data sources, data analysis methods and validation criteria.
2. Annex 2 included the two data collection tools that were used in the research, i.e. the tool to collect indicators used for SMEs' self-assessment, and the tool used to collect indicators for monitoring of the tourism industry by public authorities.
3. Annex 3 presents all the indicators collected by partners.
4. Annex 4 presents the full list of indicators of the CASTWATER indicator system.

2 INTERREG Mediterranean (MED) Programme

The MED programme[1] promotes sustainable development in the Mediterranean area, while also strengthening transnational and regional intervention strategies. In addition, regional and territorial practices can be improved through this transnational cooperation, by taking into account the potential and the challenges of specific sectors related to Blue and Green growth. In particular, tourism, SMEs competiveness, marine & environmental industries, energy, and transports, but also creative industries and social economy are especially important for the MED area. The programme's overall objective is to encourage innovative concepts and practices (technologies, governance, innovative services, etc.), the sensible use of resources (energy, water, maritime resources, etc.) and social integration through a combined and territorially based collaboration approach.

[1] http://interreg-med.eu/

3 The CASTWATER project

3.1 Background

CASTWATER is the first MED project that supports sustainable tourism policies and practices on water efficiency in coastal zones and explores the pressure of tourism on water management in the Mediterranean coastal areas. In particular, it investigates the negative impact of excessive water demand on the maintenance of natural and cultural heritage. It has been identified that during the past fifty years, the aggregate water demand in the Mediterranean has doubled, as a result of tourism's water consumption.

Given the fact that, per capita, a seasonal tourist's water consumption is double the one of a local resident's, this demand exerts heavy pressure on local water supplies in CASTWATER destinations, where water resources are more likely to be limited. While water use by tourism, on a global basis, is far less significant than agriculture, industry, or urban domestic use, in certain countries and regions, like the CASTWATER destinations, tourism can be the main factor in water consumption. Tourism can also directly affect water quality, for example through the discharge of untreated sewage or freshwater abstraction.

Furthermore, the seasonality and the localization of tourism activities, as well as the infrastructures in arid areas, highlight the necessity to measure regional tourism's effect on water at an appropriate temporal and spatial scale, rather than just relying on sporadic national assessments. At the same time, the adoption of water efficiency measures by the tourism industry is still very low in the Mediterranean coastal areas, where losses, leakages and wastage account for 40% of the total demand. In some cases, these measures introduce conflicting interests of investments for the enterprises, with regards to the retrofitting, up skilling and maintenance costs. For example, it is argued that internal water efficiency & management programmes, as well as investments in water-saving technology in rooms, facilities and attractions, reduce costs. To this end, hotels with spas and health centers could adopt a range of water-saving measures, while new hotel construction could seek to avoid pool landscapes and other water-intensive uses that can cause water scarcity, something that could lead to decrease of visitors and profit.

3.2 Contribution to strategies and policies

By supporting sustainable tourism water management in Mediterranean coastal areas, the CASTWATER project is closely linked to all other relevant sectorial strategies and policies on

sustainable tourism, and especially the Integrated Coastal Zone Management (ICZM) and Maritime Spatial Planning (MSP). In fact, CASTWATER enhances the capacity of public authorities and tourist destinations stakeholders to move towards an integrated approach that respects Mediterranean eco-systems.

CASTWATER is committed to implement the Mediterranean Strategy for Sustainable Development, by supporting the European Commission's and the United Nations' plans for sustainable tourism management in the area. In particular CASTWATER follows the Mediterranean strand UNEP-MAP (Mediterranean Action Plan for the Barcelona Convention), the Regional Activity Centres Blue Plan (for Sustainable Management) and the Priority Actions Programme PAC/RAC (for Coastal Management).

Within this context, the CASTWATER project contributes to the implementation of the following EC communications and proposals:

- The Agenda for a Sustainable and Competitive European Tourism/COM(2007)621, supporting sustainable use of resources in highly touristic areas

- The Proposal for a Council Recommendation on European Tourism Quality Principles/COM(2014)85, by adapting and specializing the use of existing evaluation tools measuring the sustainability of tourist destinations.

On a local and regional level, the project is in line with coastal tourism interventions in the partnership territories receiving support from the European Regional Development Fund, within the framework of the Regional Operational Programmes of these areas.

Finally, it takes into account thematic strategies in the area of water management and promotion of water efficiency, such as the EC Water Framework Directive (WFD) and the Water Blue Print.

3.3 CASTWATER Main Objective

The main goal of the project is 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. To this end, the project will:

a) Identify data gaps studying thoroughly relevant needs, potential impact, GPs and policies in the CASTWATER area;

b) Develop common tools and joint actions to monitor, and assess sustainable tourism water management in the area;
c) Pilot-test the developed tools to ensure their integration into the territorial policy context.

3.4 Project approach

Fresh water is a vital resource and consumption of water by the tourism sector is extremely high. Increasing tourism demand for water frequently occurs in arid coastal regions like the Mediterranean, where new sources of water, such as desalination plants, are difficult to establish, cost a lot, and often cause their own environmental problems.

To address these issues, CASTWATER follows a studying, testing and transferring approach of transnational cooperation, involving public authorities, tourism enterprises and relevant agencies and stakeholders. Main outputs are:

1. Minimization of water consumption by policies that would address (World Tourism Organization, 2005):

   • Restricting water hungry facilities such as swimming pools, golf courses, and artificial snow cannons.

   • Reusing and recycling water where possible, (e.g. use of greywater to irrigate parks and gardens).

   • Improving infrastructure and maintenance (e.g. reducing leakages).

   • Encouraging installation of water efficient technology such as low-flow showers and toilets.

   • Educating visitors to be responsible in their use of water.

2. Promotion of widespread uptake of water sustainability indicators and evaluation criteria to measure the tourism sector performance in water efficiency.
3. Development of an online tool to monitor and self-assess water efficiency status and efforts.
4. Formation of transferable learning and knowledge resources, as well as local workshops for public authorities' staff on sustainable tourism water management.
5. Development of transferable action plans for public authorities to support the integration of sustainable tourism water management approaches into policies and

measures, and for enterprises to integrate best practices in their day to day operations.

3.4.1 Studying

During the studying phase, the main objectives are:

- Study the territorial context i.e. relevant needs, challenges, potential impact, good practices, policies), in order to develop a common MED approach for monitoring and performance assessment of the tourism sector on sustainable tourism water management
- Develop tourism water sustainability performance indicators for tourism SMEs in the partnership areas
- Design a monitoring and self-assessment online tool on tourism water sustainability performance for touristic SMEs and enterprises
- Develop capacity building materials for public authorities on sustainable tourism water management

3.4.2 Testing & Transferring

During the testing phase, the main objectives are to set up an innovative online tool to monitor, compare and grade "Sustainable tourism water management" performance of tourism sector SMEs, as well as to validate it.

During the transferring phase, the main objective is to develop transferability plans for public authorities and tourism management stakeholders to transfer the project's outputs and approach on sustainable tourism water management into the relevant local/regional/national policies, strategies, and day to day operations. Moreover, to organize local policy workshops for the public authorities' staff and stakeholders to improve the knowledge and policy transfer capacity of public authorities on sustainable tourism water management.

3.5 CASTWATER expected results

On completion of the project's activities:

- Public authorities in the partnership coastal areas will achieve enhanced capacity in monitoring and measuring systematically and effectively the level of water sustainability of tourism activities in their areas, with the aim to improve water efficiency, supporting

the minimization 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 will 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 expected that more than 1000 enterprises in the tourism sector will improve their efforts to self-assess their water sustainability in the first year 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 and 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 day to day development and implementation of policy plans, in the period following the project's end.

4 Activity A3.6

Activity A3.6 is one of the CASTWATER studying activities and is described in the CASTWATER application form (p.99) in the following way:

> "This activity involves the selection, validation, and consolidation of comprehensive evaluation criteria/sustainability indicators for public authorities to comparatively assess the MED touristic areas in regards to sustainable tourism water management. This list of indicators will assess the effort & capacity of regional tourism SMEs and it will be pilot tested, as embedded in the online tool, in the context of M2, in the CASTWATER areas. The purpose of the indicators is to support local/regional water capacity assessments & water use audits in the tourism industry. RER will prepare the methodology to be used by all partners for the selection & initial evaluation of indicators, and will finalise the indicators list."

As can be seen, Activity A3.6 will support the shift to sustainable water management and policies through a list of water sustainability indicators that will enable public authorities to assess and evaluate the adoption of water efficiency measures, infrastructure, skills & awareness, and corporate social responsibility on behalf of tourism businesses and—mostly—SMEs. Public authorities will use the indicators to comparatively assess the MED touristic areas in regards to sustainable tourism water management.

The conclusion of A3.6 will be the preparation of deliverable D3.6.1, which is named "Indicators list for the evaluation of tourism water management efforts in partnership areas", and described in the following way in the CASTWATER application form:

> "Indicators list (adapting existent sustainable tourism criteria e.g. ETIS***) for SMEs***, as well as ***for Public Authorities to evaluate SMEs*** on the adoption of water efficiency measures, infrastructure, skills & awareness, corporate social responsibility."

As can be seen, the indicators' list will help public authorities evaluate SMEs on the adoption of efficient water management measures. The list will be used 1) by SMEs to monitor, compare and self-assess water efficiency status and efforts, thereby providing useful input to public authorities, and 2) by public authorities to identify issues and assess the overall 'behaviour' of tourism SMEs with regards to water management.

All in all, activity A3.6 will be concluded according to the following steps:

Step 1. Region Emilia Romagna will prepare methodological guidelines to be used by all partners for the initial selection and evaluation of efficient water management indicators in tourism. Following the aforementioned requirements of activity A3.6 and deliverable D3.6.1, Emilia Romagna will prepare guidelines to collect the following categories of indicators:

a. Indicators for self-assessment of tourism SMEs, via which the latter will provide public authorities with the necessary data to evaluate the proliferation and adoption of water efficiency measures on their behalf.

b. Indicators that will be used by public authorities to monitor and derive conclusions about the overall performance of the tourism sector, as well as the surrounding environment affecting the adoption of water efficiency measures.

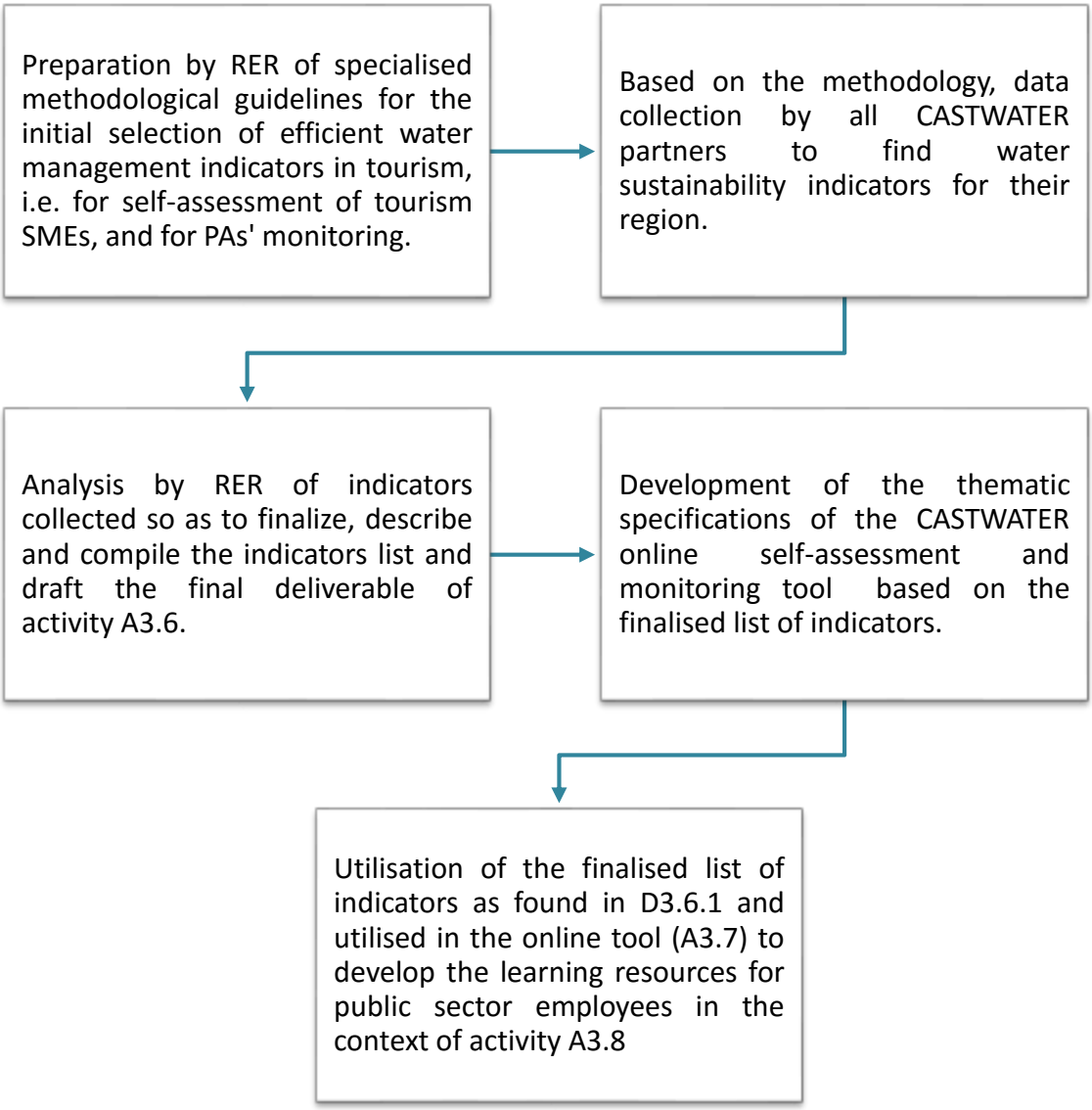
Step 2. All CASTWATER partners will use the methodology prepared by RER to **select the appropriate water sustainability indicators** for their region in order to comparatively assess sustainable water management. CASTWATER partners will provide their selected indicators as input to RER.

Step 3. RER will utilize the input of all other CASTWATER partners to finalize, describe and **compile the indicators list** in the final deliverable of activity A3.6.

After its completion, this list of indicators will assess the effort and capacity of regional tourism sector SMEs and local authorities, and it will be pilot tested, as embedded in the **online tool** for the CASTWATER territories (activity A3.7).

This document is the outcome of step 3 of this process, i.e. the finalised indicators list that will be further used in the remaining deliverables of the studying phase of the CASTWATER project. The process for the completion of this activity and the links with future CASTWATER deliverables can be seen in the following flow chart:

Figure 1: Flow chart for the development and utilisation of the list of indicators in CASTWATER



5 Research Questions

Following the description in the previous section of the two uses of the indicators and the process of completion of activity A3.6, the research questions used as the starting point of this analysis were those listed in the following table (Table 1):

Table 1: Research Questions

CASTWATER A3.6: Research questions	
1	Which are the proper water sustainability indicators to measure and evaluate water efficiency in the tourism sector in your region?
2	How can water sustainability indicators be used to measure and evaluate water efficiency in the tourism sector in your region?

Question 1 can be regarded as the main research question of the research. It essentially asks to identify the sustainability indicators that will be used in order to evaluate water efficiency in tourism in each partnership region. Question 2, on the other hand, is the conclusive research question meaning that it will provide the necessary data to proceed to the evaluation of the water sustainability indicators in the 3rd step of this enquiry. Without knowledge about how to use indicators to measure and evaluate water efficiency in each region, it would be difficult to evaluate each indicator and compose the finalized list. The following section initialises the effort to answer those questions by providing the context for the use of indicators in complex problems such as sustainability of water resources in tourism.

6 Using indicators in research: argumentation

The key challenge faced by Mediterranean economies nowadays, is how to combine on the one hand the need to develop in a sustainable way and protect their natural heritage and water resources, and on the other hand the reality of the contemporary business world (tourism not excluded) that is characterised by 'phenomena such as e-business, globalisation, higher degrees of competitiveness, fast evolution of new technology, rapidly changing client demands, as well as changing economic and political structures' (Marr et al., 2004, p. 551).

Facing such challenges, tourism businesses need to plan and unravel specialised strategies that will give them a competitive advantage (Porter, 2001), without compromising the natural resources upon which this competitive advantage is based, i.e. the environment of the Mediterranean. Similarly, public authorities who aim to encourage sustainability, need to encourage development plans that take into account both sustainability needs of each territority and the profitability and prosperity of businesses. To achieve such aims, both these types of institutions need to found their organisation on specialised knowledge, which should not limit itself to financial data and reports. Afterall, the issue of sustainability means that there are externalities akin to the environmental performance in the function of a tourism enterprise that affect its overall value and cannot be estimated using accounting and financial reporting data. It is evident that the estimation of environmental performance factors allows for the development of a thorough understanding of the challenges faced by companies, thereby enabling improved security selection and risk management (Bassen and Kovács, 2008).

The abovementioned rationale was the reason why major institutions developing policy and regulating economic development on the one hand and the tourism sector in particular on the other, resorted to the use of specialised indicators that complement accounting and financial reporting data. After their development the indicators were articulated in indicator systems to improve the monitoring procedures of public authorities. One such example of a policy making authority is the EU Accounts Modernisation Directive (effective since January 1st 2005) that required companies in the European Union to include in their Directors' Report "both financial and, where appropriate, non-financial key performance indicators relevant to the particular business, including information relating to environmental and employee matters", in order to enable a balanced and comprehensive analysis of the development and performance of the business (Directive 2003/51/EC) (Bassen and Kovács,

2008, pp. 187-188). Another example is the use of innovation indicator systems by the OECD and Eurostat (2005), to develop an understanding for the integration and proliferation of innovations in the European Union. Examples of the use of indicators in the tourism sector include the European Tourism Indicator System (European Commission, 2016), applied in the European Union and the OECD Indicators for Measuring Competitiveness in Tourism (Dupeyras and MacCallum, 2013).

As can be seen in further detail in Annex 1 of this document (alongside more detailed descriptions of indicator systems and monitoring procedures), an indicator is an observed value representative of a phenomenon of study. In general, indicators quantify information by aggregating different and multiple data. The resulting information is therefore synthesized. Indicators simplify information thereby assisting the development of an understanding of complex phenomena (European Environment Agency, 2000). The main justification for the use of indicators in tourism development, sustainability and regulation, is the predominant complexity of increasing the sustainability of economic sectors. By arguing that achieving sustainability in tourism is a *complex* process, this analysis accepts that policies fail because of random events, unanticipated technological change or patterns in the economy (Bak, 1996; Urry, 2005). By quantifying phenomena and simplifying complex realities, indicators are able to rapidly provide key information about important factors to support decision-making and promote public awareness regarding the issues with which they relate. Hence, they can allow researchers to develop a more thorough understanding of the process of increasing the sustainability of tourism, and in the case of CASTWATER of increasing the sustainable management of water resources in tourism SMEs and in general businesses.

To state the argumentation above in simpler words, indicators can be effectively used to warn about areas of concern so that action can be taken early enough. In our case, water sustainability in tourism is a multi-faceted problem that currently lacks a complete and organized system that can serve as a warning, and, as a result, ends up finding out problems too late – usually in the form of excessive waste of water. As indicators are measures of important factors that are crucial for decision-makers, in order for them to reduce the risks, that means that these decision-makers can use certain information or data sets as indicators to inform policy making procedures.

7 Applying indicators to improve water sustainability in tourism: methods and criteria

Despite the fact that indicators can be used to reduce the complexity of phenomena akin to increasing the sustainability of various sectors of the economy, this can only happen to the extent that indicators are not used under the premise of a simplistic understanding that claims that the world is like a machine. This premise leads to the conclusion that the world can be taken apart and rearranged at will, and that indicators are there to estimate the different parts of the machine and to help us discover its parts that are not working effectively, and to develop policies to make the machine produce the right results (Innes and Booher, 2000). On the contrary, indicators should be used so as to take into account the fact that the phenomenon in question, i.e. water sustainability in tourism is affected by a multitude of factors. Business people, residents, tourists, policy makers, among others, make myriads of decisions which shape collectively and simultaneously the entirety of water management in tourism. A distributed network of human agents, each with little knowledge, can generate outcomes and results that are coordinated and that exhibit more intelligence collectively than any individual.

Within such a complex reality, the most efficient course of action for specialised policy makers in the sector is to help all those players change their behaviour that affects negatively the sustainability of water in tourism, thereby making the system more adaptive. After all, with such a multitude of agents in the system, by convincing them to change their behaviour in small ways, it is possible to produce a self organizing approach that deals effectively with the complexity of the issue addressed (Kelly, 1994). As explained by Innes and Booher (2000, p. 179):

> "The spontaneous action of individual agents responding to their environment can result in more rapid response and effective change than a more cumbersome approach of designing and trying to implement carefully wrought plans and programs."

Following this suggestion, CASTWATER aims to develop an system that will integrate indicators in a self-assessment procedure for representatives of tourism businesses and especially SMEs with regards to improving water sustainability in tourism. Within this context, it is clear that single indicators will not be meaningful enough to provide useful information for complex phenomena, and instead, it is necessary to use more than one indicator to develop an understanding of water sustainability in tourism. Even more so,

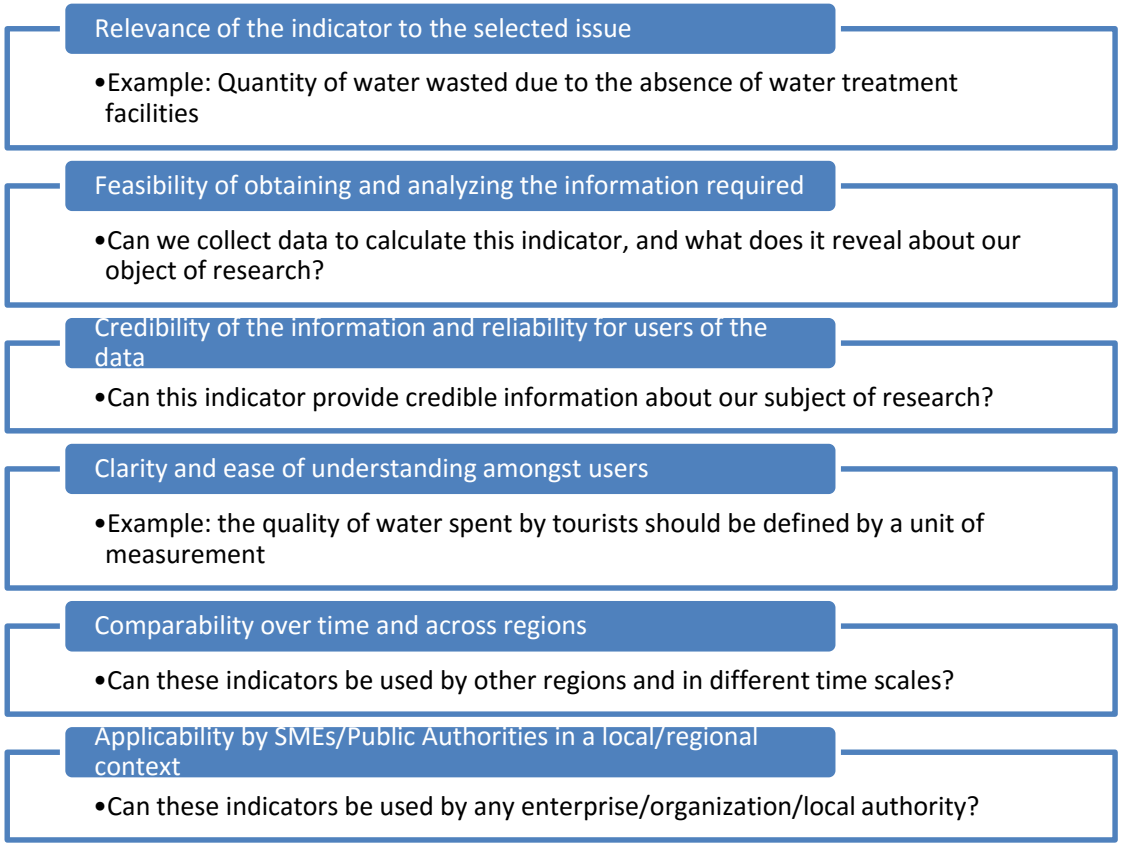
using multiple indicators without organizing their evaluation means that important information about a phenomenon such as the use of water in tourism might not be detected. To avoid that, multiple indicators are organized as indicator systems. Indicator systems are usually designed to generate more and more accurate information about specific conditions in complex phenomena and are more than just a collection of indicator statistics. Ideally, a system of indicators measures distinct components of the system and also provides information about how each individual component work with others to produce the overall effect. As a result, mirroring the characteristics of complex phenomena, such as water sustainability in tourism, the whole of the information provided by a system of indicators is greater than the sum of information provided by unorganized assemblages of indicators.

Therefore, an Indicator System is a locally owned and led process utilizing a number of indicators for collecting and analyzing data with the overall objective to assess the impact of tourism on water management at specific destinations. The indicators can serve as a management tool, based on self-assessment, observations, data collection and analysis by the destinations themselves. Essentially, the objective is to improve the sustainable management of water by measuring their relevant processes and monitoring their performance and progress over time.

Finally, to avoid getting lost in a wide range of impractical information, it is sensible to select the right indicators, according to the goals and the relative priorities of CASTWATER. Each region can choose the most relevant indicators they wish to adopt and monitor, in order to meet their local needs, the interest of local stakeholders and the specific water sustainability issues that each of them faces in their local tourism industry (European Commission, 2016).

Summing all the aforementioned arguments, a number of selection criteria were developed for the indicators to be applied in the CASTWATER project. The selection criteria can be further divided into *functional* and *thematic*: the former refer to some technical characteristics of indicators that, if satisfied, allow them to compose an indicator system that sheds light to the complex characteristics of the sustainability of water uses in tourism. The latter refer to some topical characteristics of indicators that, if satisfied, render them suitable for developing an understanding of the degree of water efficiency in tourism. The following figure summarises the functional selection criteria for the indicators developed and used in the context of CASTWATER (based on Diamantis, 2004, pp. 83-84):

Figure 2: Indicator functional selection criteria and clarifications



Readers can see that the criteria chosen aim specifically to address the complex character of water uses in tourism. The epistemology of the selection criteria is based on the assumption that complex problems can indeed be analysed and investigated (Urry, 2003). This can be achieved through the use of indicators for which one can easily find data, and that are relevant, credible, clear, and comparable & applicable in multiple contexts. The fact that such indicators should be relevant, however, means that, in order to take the complexity of the issue under account, it is necessary to develop some thematic specifications which will make sure that the indicators proposed by CASTWATER partners and, ultimately, the indicator system developed within CASTWATER activity A3.6 is suitable and tailored to the needs of investigating the efficiency of water use in tourism SMEs and businesses in general. The following figure presents some initial thematic indicator categories that were used in the data collection phase of activity A3.6 to ensure that the indicators collected will be relevant to water sustainability (Source: European Commission, 2016; Sustainable Water Resources Roundtable, 2007):

Figure 3: Initial thematic indicator categories

1. Water availability	• Assessing the amount of water available to be allocated for human and ecosystem uses
2. Water quality	• Assessing the suitability of water quality for human and ecosystem uses
3. Human uses and health	• Assessing people's benefits from the use of water and water-dependent resources
4. Environmental health	• Assessing the effects of water use in the conditions of ecosystems
5. Infrastructure and institutions	• Assessing if the infrastructure and institutions enable the sustainable use of water

Readers can see that the thematic indicator categories have been selected so as to cover multiple aspects of water use and sustainability in tourism SMEs. The initial indicator categories, i.e. the thematic selection criteria were based on the ETIS toolkit developed by the European Union (European Commission, 2016, p.22) and the Current Indicator Framework of the Sustainable Water Resources Roundtable of the US Advisory Committee on Water Information (Sustainable Water Resources Roundtable, 2007, p.1). More precisely, category 1 was chosen to lead to the selection of indicators that provide information on the amount of water available to be used in tourism, and potential water shortages in the ecosystems of tourism destinations. Category 2 was chosen to help locate indicators that measure the impact of tourism development on the water quality used in tourism SMEs and/or discharged by them back into ecosystems. Category 3 was selected to help find indicators estimating the positive impact of the adoption of measures for sustainable water use in the tourism sector. Category 4 was included in order to find indicators that estimate the positive impact of the adoption of sustainable water use measures by the tourism sector on ecosystem conditions (e.g. decrease of pollution). Category 5 was selected to locate indicators that measure the rate/progress of tourism SMEs in the adoption of measures for sustainable water uses.

Having developed the selection criteria for the indicators, this research proceeded to the development of a specific methodology. The methodological approach of this study was

specifically designed to answer the research questions in a way that led up to the successful completion of activity A3.6 and can be seen in detail in Annex 1. To summarise here, the methodology that was chosen consisted of the methods of external and internal desk research. Desk research was selected as a method capable of delivering a fast and reliable overview of a large number of best practices by assessing rapidly a large number of (primary or secondary) sources, albeit with the caveat of having to assess and integrate the perspectives & feedback of these sources in the research. It is considered an efficient and cost-effective way to capitalize on already existing knowledge which does not require specialized personnel. Thus, the collection of all the relevant information about the indicators related to water uses and sustainability in touristic coastal areas of the Mediterranean, became significantly easier. Desk research that retrieves secondary data bears the advantage of providing perspectives based on already analyzed and validated data. Hence, desk research within this investigation, helped accelerate the selection of indicators by offering ready to be used rationale and categories to the data that needs to be collected.

Desk research used in A3.6 data collection consisted of both external and internal desk research. The term external desk research, referred to research conducted outside the organizational boundaries of each organisation. Due to the immense availability of data in the internet, external desk research consisted mostly of Online Desk Research. The term internal desk research, on the other hand, referred to the collection of data by members of one organization within their organisation.

To organise the presentation of the results of data collection and to ease their analysis, CASTWATER partners used two data collection tools to present the indicators they selected. The tools can be seen in Annex 2 and were drafted so as to 1) allow partners to categorise and comment on the indicators as per their congruence with the thematic selection criteria, 2) provide short descriptions of the indicators and present their measurement units, and 3) rank the indicators with regards to how much they abide by the functional selection criteria. The tools also requested partners to include the data sources they used to locate the indicators. Only indicators that 1) were identifiable as relevant to the thematic selection criteria, and 2) received middle to high ranks about how much they satisfied the functional selection criteria, were chosen to be included in the finalised indicators' list, and were thus identified as capable of unravelling the complex issue of water sustainability in tourism.

Moreover, it is important to point out that, since the indicators are to be addressed to both tourism SMEs (as a building block of a self-assessment tool) and to public authorities (as an

instrument to assess water sustainability in tourism in their territories), each of the two data collection tools was adapted to the needs of each of those two categories. The first data collection tool was used to provide indicators to be used for tourism SMEs' self-assessment. The second data collection tool was used to provide indicators for the monitoring of water sustainability in tourism by public authorities. The two tools are almost identical, with the caveat that the tool for public authorities includes a further specification for the applicability functional criterion. Since public authorities are can be categorised as national, regional and local, partners had to rank the applicability of each indicator with regards to their potential for applicability in these three different levels of governance.

8 Data collection

By applying the methods of external and internal desk research, CASTWATER partners provided a number of indicators that (most of them) satisfied the selection criteria presented in the previous section. Annex 3 includes two tables that summarise the indicators provided by each partner for SMEs and public authorities respectively.

Most partners provided a sufficient amount of indicators that respected the validation criteria set in the Methodology. Fortunately, this not only allowed for the finalisation of the list of indicators, but also helped develop self-assessment indicator categories and indicators to be used for monitoring of the sustainability of water uses in tourism by public authorities. The number of indicators provided by each partner for both tourism SMEs' self-assessment and for PAs' monitoring is presented in the following table:

Table 2: Number of indicators collected by each partner

Number of indicators provided by partners										
Partner	Water availability		Water quality		Human uses and health		Environmental health		Infrastructure and institutions	
	SME	PA	SME	PA	SME	PA	SME	PA	SME	PA
Municipality of Rethymno (MoR)	1	1	1	1	1	1	1	1	2	1
Emilia Romagna Region (RER)	5	3	0	3	4	0	1	0	3	3
Veneto Region	2	2	1	2	1	2	3	4	2	1
Water Board of Lemesos (WBL)	2	3	3	1	1	1	1	1	3	1

Number of indicators provided by partners										
Partner	Water availability		Water quality		Human uses and health		Environmental health		Infrastructure and institutions	
	SME	PA	SME	PA	SME	PA	SME	PA	SME	PA
University of Patras (UPAT)	2	1	1	1	1	1	2	1	2	1
Euromediterranean Water Institute Foundation (F-IEA)	7	4	4	3	4	5	4	4	4	4
Institute of Agriculture and Tourism (IPTPO)	3	2	1	1	5	0	1	1	4	2
Departmental Council of Herault (CD34)	4	2	8	2	4	1	5	2	1	1
Malta Regional Development and Dialogue Foundation (MRDDF)	5	5	4	3	2	4	4	4	4	4
Energy and Water Agency (SEWCU)	2	2	1	1	1	2	2	2	2	2
Total	**33**	**25**	**24**	**18**	**24**	**17**	**24**	**20**	**27**	**20**

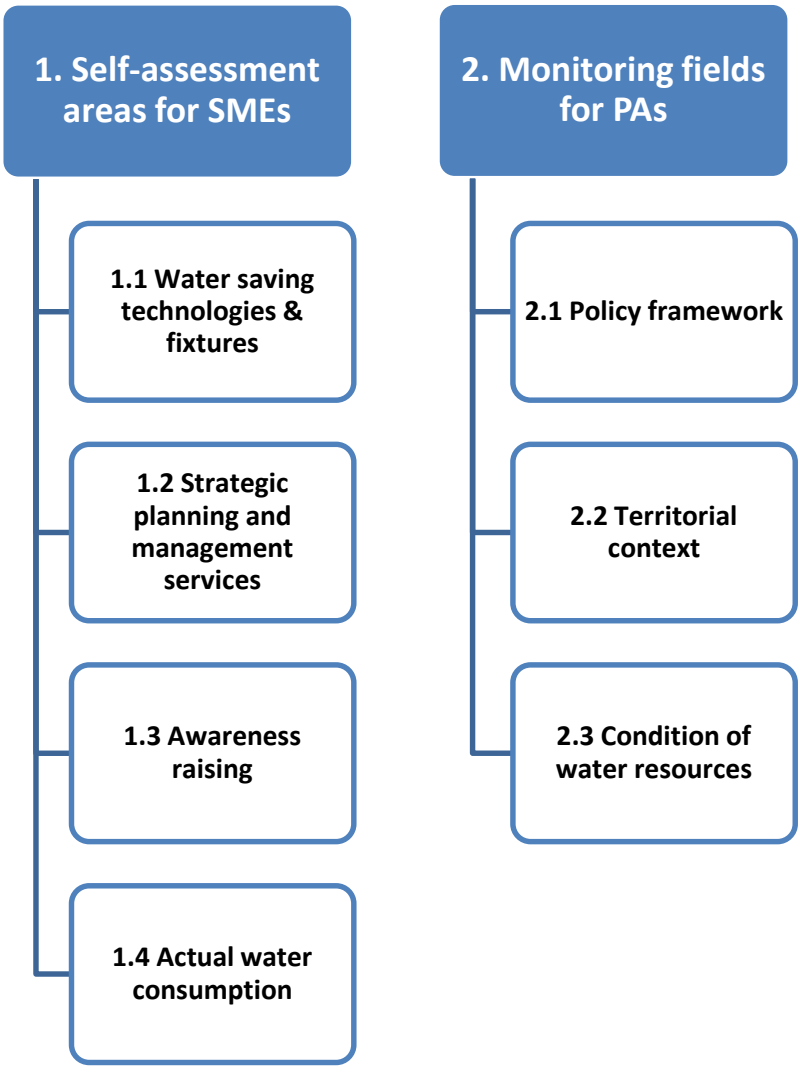
Nevertheless, as can be inferred from the table above, the data analysis results that are presented in the remainder of this document should be considered with caution since, despite the multitude of indicators received, not all partners managed to satisfy the quantitative and qualitative validation criteria of the research that are presented in the methodology found in the Annex. The most common deficiency of the data delivered by

several partners, was the fact that partners did not always provide links with the sources from which they derived their indicators. As a result it was impossible to cross check the validity of the local application of specific indicators and/or obtain some more information for such indicators. Others did not report the measurement units of their indicators and this inihibited the development of an understanding about how to measure these indicators. Moreover, some partners, even neglected to provide the names of the idnicators they proposed, whereas others replaced the thematic selection criteria and, hence, provided indicators that pertain in distinct categories, thereby rendering more difficult the comparative analysis of indicators across CASTWATER territories.

9 The CASTWATER indicator system: overview and affinities

When analysing the big picture however, the aforementioned deficiencies did not render invalid the data collection of activity A3.6. Open coding during the analysis of the multitude of indicators supplied by partners allowed for the identification of specific indicator thematic categories that pertain to tourism SMEs' self-assessment and public authorities' monitoring of the uses of water in tourism in their territories. What that means is that the analysis of the data allowed for the development of the CASTWATER indicator system, which is customised to the issue of water sustainability in the tourism sector of Mediterranean territories, and includes several distinct indicator categories. The indicator categories are presented in the following figure:

Figure 4: Indicator categories identified in the data



On the one hand, the identified indicator categories to be used as self-assessment areas by tourism SMEs can be briefly described in the following way:

1. Indicators for the adoption of water saving technologies and fixtures will estimate the degree of integration of innovative technologies and solutions by tourism SMEs, since such innovations can both minimise water consumption (demand) and increase water availability (supply).
2. Indicators that estimate the adoption and evaluate strategic planning and management processes are a key aspect of a successful water conservation programme so as to substantially facilitate the adoption of targeted measures to minimise water consumption.
3. Awareness raising indicators estimate the extent to which tourism SMEs engage and train their employees and tourists on water efficiency consumption methods, so as to change their behaviour and make it more friendly to water sustainability.
4. Indicators evaluating the trends of actual water consumption will help calculate the amount of water required during peak seasons, and subsequently the extent of pressure placed on water resource, due to the current characteristics of tourists' water consumption which are due to contemporary tourism trends.

On the other hand, the identified indicator categories to be used by public authorities (PAs) to monitor the sustainability of the uses of water by tourism businesses in their territories can be briefly described in the following way:

1. Indicators akin to policy framework will help understand the existence and effectiveness of actions or measures taken by a public organisation to reach pre-determined objectives (e.g. to promote sustainable tourism water management), that advance the sustainability of water use in tourism.
2. Indicators that assess territorial capacity are essential for identifying the regional characteristics of water consumption and supply that contribute to or undermine the sustainability of water resources in territorial contexts.
3. Indicators estimating water availability & quality and environmental health will be used to measure the impact of the adoption of water efficiency measures on ecosystem conditions, and more especially on the quality of water in Mediterranean coastal destinations.

All indicator categories used for both self-assessment and public authorities' monitoring processes will be presented and analysed in detail in the subsequent sections of this document. For the purposes of this overview, however, it is necessary to further point out that the indicator categories emerging from the data overlap with issues identified in other

deliverables of the CASTWATER project. For example, in the conclusions of activity A3.2 of the CASTWATER project, it is argued that there is a need for the following:

1. **New pricing scheme:** The economic cost of water is not always the most important influential factor of water demand for the majority of the touristic enterprises. Therefore, a different type of pricing/tariffs is required to strengthen the need for touristic enterprises to achieve water efficiency. The type of new pricing schemes, or in general, other similar policy measures, can be further evaluated using the indicators that pertain to the policy framework category (2.1).

2. **Financial support for new technologies adoption:** The cost of installation and maintenance of water demand 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). There is a need for co-funding by the water providers or the government. Since funding is a policy measure, this too can be further evaluated using the indicators of category 2.1.

3. Policies and regulations: Except from region of Murcia there is not any other region that implemented specific policies and regulations to help water efficiency in the touristic sector. It is critical that governments develop such policies that will boost the water efficiency of the touristic sector. This too can be further evaluated using the indicators of category 2.1.

4. Sustainability certificates: the majority of the enterprises express their high interest to invest in achieving a sustainability certificate. There is a need for specific sustainability certificates available for each type of touristic enterprise. Sustainabiliuty certificates can be considered the outcome of actions taken by tourism businesses that cvan be evaluated using the indicators of categories 1.1 and 1.2.

5. Awareness/training: Employees training program and rewards are limited. There is a need for advanced training courses and workshops by the tourism sector in order to train the employees to save water. By definition this category of measures can make use of the indicators pertaining to category 1.3.

6. Alternative water sources: the existence of in-house alternative water sources is rare in the tourism establishments. There is a need to support the enterprises to implement such alternative water sources. This could be achieved by co-financing or tax releases or any

other financial incentive by the governments. This category of measures can make use of the indicators pertaining to category 1.4.

Having presented the affinities and key indicator categories of the CASTWATER indicator system, it is now time to present the specific indicators that pertain to each category and to explain how and what they will estimate, thereby providing a final response to the research questions outlined in previous sections. The following sections present the different indicator categories of the CASTWATER indicator system. The latter can be seen in its entirety in Annex 4.

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

Description

The first indicator category that will be embedded in the remaining deliverables of the CASTWATER project, is the one addressing the adoption on behalf of SMEs of water saving technologies and fixtures. 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 indicators

Table 3: 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

Code	Indicator	Indicator description	Measurement unit
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 amount of tourism SMEs using smart irrigation technologies, 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

Calculating the value of the indicators

It is proposed that these indicators are used to develop questions that reveal various qualitative aspects of the adoption of water efficient technologies and infrastructures. Tourism SMEs and businesses should be asked to clarify if they have already applied or not specific types of water efficiency instruments. Queries should distinguish between major types of technologies/fixtures (e.g. water saving devices, efficient irrigation techniques) and, in addition, should attempt to clarify the amount of investment each tourism SME has dedicated to water efficiency during the last year of its function compared to its total budget. The higher the degree of investment in water efficient technologies and the larger the number of types of fixtures tourism SMEs have already applied, the more positive the evaluation they ought to receive.

Through the utilisation in the A3.7 tool of simple questions focusing on the type of water technologies/fixtures, tourism SMEs will manage to rapidly develop an understanding of how many types of water efficiency fixtures they have already applied. They will also receive an account of other water efficiency fictures they have not applied so far. This information, combined with the evaluation they will receive at the end of their self-assessment will help them change their behaviour and apply these technologies/fixtures. Furthermore, public authorities could use the results of SMEs' self-assessment to develop policy measures and incentives easing the proliferation of water efficient technologies and fixtures in their territory. After all, the self-assessment results could provide them with an indicative sample of the diffusion of technological innovations akin to water efficiency in tourism in their territories. Hence, these small changes in the behaviour of multiple players (SMEs and Pas) generated by CASTWATER self-assessment could lead to significant changes in the water efficiency of the tourism industry of the Mediterranean.

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

Description

The next self-assessment area- indicator category to be included in the list of indicators for self-assessment 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:

1. 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.
2. 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 indicators

Table 4 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 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

Code	Indicator	Indicator description	Measurement unit
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 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

Calculating the value of the indicators

Using an analogous rationale to the one used for the first self-assessment area, the indicators of self-assessment area 1.2 are designed to reveal various qualitative aspects of tourism SMEs, but this time focusing on their institutional strategy and management of water efficiency. Since the latter does not necessarily appear in the SMEs' financial statistics, the online tool should utilise the indiactors of self-assessment area 1.2 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 should be 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 should be used to to reveal if tourism SMEs have adopted and are certified to apply specific environmental management systems (e.g. ISO 1400). This is important information since the application of specific management systems can have a signalling effect and reveal the successful functioning of tourism SMEs towards the achievement of environmental goals, as can be seen in the following quote which refers to certified management systems (Terlaak and King, 2006, p. 29):

> "We hypothesize that certification may provide a way of communicating about unobservable firm attributes, thereby generating a growth effect for certified organizations. Our results are consistent with this hypothesis. We find that certified facilities grow faster, and that this advantage does not result from changes in quality performance, inventory management, within-firm production allocation, or pre-certification growth differences. We also find that certification is particularly beneficial for organizations that operate in large and advertising intensive industries – industries where information search costs may be higher."

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. 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.

12 Self-assessment areas: Awareness raising indicators

Description

Self assessment area 1.3 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. 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. The main motivation behind the inclusion of such indicators in SMEs' self-assessment areas is that 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 indicators

Table 5: 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

Calculating the value of the indicators

In this self-assessment area, tourism SMEs will be ranked according to the extent to which they have applied informed 1) training procedures for their personnel and 2) awareness raising campaigns for their tourists-customers. More precisely, tourism SMEs will get a higher rank in this self-assessment area if they have applied training procedures that cover the multiple thematic facets of water sustainability and include measures to encourage and reward their staff for decreasing their water consumption. Similarly, they will get a higher rank, if they apply a multifaceted awareness raising campaign for their customers that includes more than one type of actions. Tourism SMEs will benefit by this self-assessment by realising how efficient and thematically relevant their training and awareness campaigns are. 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.

13 Self-assessment areas: Actual water consumption indicators

Description

Self-assessment area 1.4 includes indicators designed to help alleviate pressures on water resources, mostly by providing information about water demand management. Such indicators were chosen so that CASTWATER can help onfront substantial challenges regarding water management, such as the following:

1. 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.
2. The average tourist's water consumption is much higher than the average per capita residential consumption.
3. Existence of huge potential to reduce water consumption in the Mediterranean tourism industry.
4. 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.

The indicators

Table 6: 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

Code	Indicator	Indicator description	Measurement unit
			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.

Calculating the value of the indicators

Unlike those of the previous sections, the indicators of self-assessment area 1.4 are aimed at gathering quantitative information about the water management and uses of tourism SMEs. To estimate the value of actual water consumption, tourism SMEs' representatives will have to provide data about their water consumption per visitor during peak & shoulder season and off-season, and if applicable, to analyse the actual water consumption in indicative different uses of water. Certainly, the data provided by tourism SMEs' will be compared with the following benchmarking values to provide an accurate estimation of the relative progress the SME has achieved with regards water sustainability:

Table 7: Statistics for water consumption in partnership countries (country breakdown)

Country	Average domestic consumption per capita per day*	Average water consumption per visitor per day**
Croatia	116 litres/day	130 litres/day
Cyprus	251 litres/day	465 litres/day
France	140 litres/day	169 litres/day
Greece	258 litres/day	400 litres/day
Italy	220 litres/day***	264 litres/day
Malta	135 litres/day	312 litres/day

Spain	143 litres/day	188 litres/day

* Source: Eurostat (2015)
** Source: Partners' input & Becken (2014)
*** Source: Istat (2017)

As can be seen, the water consumption of tourists per 24h will be compared with both residential and tourists' average water consumption to ensure that the SMEs receive feedback about their relative progress compared to both these two types of water consumption. The smaller the discrepancy between tourist and residential consumption, the better for water resources, exactly because residential consumption is lower. The smaller the ratio between tourism SMEs' average visitor water consumption and average tourist consumption, the smaller the impact of the SME on water resources compared to other tourism businesses. Furthermore, the value of the wastewater treatment indicator will be calculated through the comparison of yearly water consumption (m^3) with the amount of wastewater receiving treatment per year (m^3).

The rationale behind the inclusion of these indicators in the finalised list, has to do with the fact that, after their self-assessment, tourism SMEs should be able to compare themselves with the whole tourism industry of their territory and estimate their progress.

14 Monitoring fields: Policy framework indicators

Description

Moving on to the monitoring fields to be included in the remaining deliverables of CASTWATER, and, more precisely to monitoring field 2.1, tourism SMEs will have to answer to queries akin to indicators designed to 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 has 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), conflicts resolution, promotion of services and infrastructures, and incentives provision. Tourism SMEs' representatives will be asked to assess the policy framework underlying tourism water management in their territory, and to provide actual information about the frequency of controls conducted by public organisations about the quality of distributed water.

The indicators

Table 8: 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.

Code	Indicator	Indicator description	Measurement unit
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.

Calculating the value of the indicators

Tourism SMEs will help calculate the value of indicator PA1 by ranking with a value between 1 and 5, several different types of policies that aim at promoting and ensurting water sustainability in the tourism sector. SMEs' representatives will be asked to rank many different types of policies (e.g. funding, conflict resolution mechanisms) in order to cover all the wide spectrum of policies promoting and advancing the CASTWATER project aims. Indicator PA2's value will be estimated by providing the frequency of controls of the quality of water conducted by public authorities.

The two indicators of this monitoring field were chosen to ensure that public authorities will receive both the subjective feedback about how tourism SMEs value their policies and the efficiency of their implementation and a sample with objective observations about the implementation of water quality control procedures. The reason why they should receive the former, has to do with the importance of collaboration with the private sector for the success of any policy in the competitive contemporary tourism industry. 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. The indicator related to quality controls was included as a method to test the efficiency of publci control mechanisms of the quality of water, which is perhaps the most important health related aspect of water sustainability.

15 Monitoring fields: Territorial context indicators

Description

Indicators corresponding to monitoring field 2.2, are aimed at assessing the territorial capacity for improvements in water sustainability in tourism in the Mediterranean. What that means is that these indicators will be used to identify regional attributes and resources that can be utilised by policy makers to advance further measures on sustainable tourism water management. Certainly, given the characteristics of the online tool as described in the application form and the fact that tourism SMEs will provide the answers, the regional attributes identified through the use of the indicators will be related to the perspectives and views of SMEs with regards the issue of water efficiency in tourism. The rationale for evaluating territorial capacity is, similarly to CASTWATER A3.4 activity, a "SWOT analysis" approach that receives information from an environmental analysis and separates it into factors such as internal strengths and weaknesses and external opportunities and threats, to evaluate what a territory can and cannot do. These factors will be categorised along the lines of a PESTEL analysis (i.e. Political, Economic, Socio-cultural, Technological, Environmental, and Legal factors). Furthermore, tourism SMEs will be evaluated with regards to 1) their water consumption compered to the residential water consumption and total water consumption, 2) the infrastructure they use to treat their wastewater and 3) the degree of integration of sustainable tourism services (e.g. ecotourism) to the tourism packages/itineraries/products they offer, since sustainable tourism services can potentially alleviate the pressures to water and in general environmental resources, as can be seen in the following quote (United Nations Environment Programme and World Tourism Organization, 2005, p.11):

"Thus, sustainable tourism should:

1) Make optimal use of environmental resources that constitute a key element in tourism development, maintaining essential ecological processes and helping to conserve natural heritage and biodiversity."

The indicators

Table 9: Territorial context indicators

Code	Indicator	Indicator description	Measurement unit

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.

Calculating the value of the indicators

To calculate the value of indicator PA3, it is necessary to ask tourism SMEs' representatives to assess their territory's capacity (i.e. regional environment) in supporting policy measures on sustainable tourism water management. It is necessary that tourism SMEs'

representatives provide an evaluation of the PESTEL factors that affect territorial water sustainability in the tourism industry, such as the following:

1. Policy measures applied by public authorities (e.g. water governance systems).
2. Economic factors affecting water sustainability in the local tourism industry (e.g. cost of water saving policies).
3. Socio-cultural factors affecting water sustainability in the local tourism industry (e.g. level of awareness of the issue).
4. Technological aspects of water sustainability in the local tourism industry (e.g. water saving technologies' availability in the territory).
5. Environmental issues with an impact on water sustainability in the local tourism industry (e.g. climate change impact on the availability of water resources).
6. Legal factors affecting water sustainability in the local tourism industry (e.g. existence of legislation about water recycling).

To calculate the value of indicators PA4-6, tourism SMEs' representatives will be asked to provide specific objective answers about the quality of their infrastructure with regards to wastewater treatment, their utilisation of sustainable tourism products (so as to reduce water consumption), and the ratio of water consumption by tourists compared to total or residential average water consumption.

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.

16 Monitoring fields: Condition of water resources indicators

Description

Indicators pertaining to monitoring field 2.3 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 will be used 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.

The indicators

Table 10: 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

Calculating the value of the indicators

The value of the idnicators of monitoring field 2.3 can be calculated by the provision of data by tourism SMEs about 1) the alternative water sources they utilise to supply water to their facilities, 2) the existence of any known incidents of water borne diseases occuring among their customers, and 3) the number of complaints they received by tourists about water quality during the last year of their function. In addition, tourism SMEs will provide their views about the quality of water for different water uses (e.g. bathing, swimming pool use).

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 they will manage to embed the perspectives of tourism SMEs in their plans to improve water quality and sustainability.

17 References

Bak, P., 1996. *The Way Nature Works: The Science of Self-Organized Criticality*. New York: Springer Verlag.

Bassen, A., Kovács, A.M., 2008. "Environmental, social and governance key performance indicators from a capital market perspective". *Zeitschrift für Wirtschafts- und Unternehmensethik*, Vol. 9, No. 2, pp. 182-192. URN: http:// nbn-resolving.de/urn:nbn:de:0168-ssoar-348863.

Becken S. 2014. "Water equity – Contrasting tourism water use with that of the local community". *Water Resources and Industry*, Elsevier, Vol. 7-8, pp. 9-22.

Beritelli, P., 2009. "Social network analysis in destination management". Available at: http://etourism.economia.unitn.it/documents/3.pdf (accessed 11-01-2018).

Bryman, A. 2004. *Social Research Methods* (2nd edition). Oxford: Oxford University Press.

Coccossis Harry et al., 2001. *Defining, Measuring and Evaluating Carrying Capacity in European Tourism Destinations.*

DailyWritingTips, 2017. "15 Types of Documents". Available at https://www.dailywritingtips.com/15-types-of-documents/ (accessed 11-01-2018).

Diamantis, D., 2004. *Ecotourism. Management and Assessment*. London, UK: Thomson Learning.

Dupeyras, A., and MacCallum, N., 2013. "Indicators for Measuring Competitiveness in Tourism: A Guidance Document", *OECD Tourism Papers*. OECD Publishing. Available at: http://dx.doi.org/10.1787/5k47t9q2t923-en (accessed 08-01-2018).

European Commission, 2016. *The European Tourism Indicator System. ETIS toolkit for sustainable destination management*. Available at: http://ec.europa.eu/DocsRoom/documents/21749 (accessed 08-01-2018).

European Environment Agency, 2000. *Are we moving in the right direction? Indicators on transport and environment integration in the EU. TERM 2000.* Environmental issues report.

European Union, 2010. *Sustainable Water Management through Common Responsibility enhancement in Mediterranean River Basins. Water Management Common List of Indicators & Database.*

Eurostat, 2015. Water_statistics_YB2017_V7. Available at: http://ec.europa.eu/eurostat/statistics-explained/index.php/Water_statistics (accessed 30-01-2018).

Farsari Yianna, 2001. *Sustainable Tourism Indicators for Mediterranean Established Destinations.*

Hearst Newspapers LLC, 2018. *5 Types of Business Documents*. Available at: http://smallbusiness.chron.com/5-types-business-documents-22842.html (accessed 11-01-2018).

Innes, E., and Booher, D.E., 2000. "Indicators for Sustainable Communities: A Strategy Building on Complexity Theory and Distributed Intelligence", *Planning Theory & Practice*, Vol. 1, No. 2, pp. 173-186.

International Institute for Sustainable development & World Tourism Organization, 1993. *Indicators for the Sustainable Management of Tourism.* Available at: http://www.iisd.org/pdf/2011/indicators_for_sustainable_tourism.pdf (accessed 11-01-2018).

Istat, 2017. *Water Sensus-Year 2015*. Available at: https://www.istat.it/en/files/2017/12/EN_Water_census.pdf?title=Water+census+-+14+Dec+2017+-+Full+text.pdf (accessed 30-01-2018).

Kelly, K. 1994. *Out of Control: The Rise of the Neobiological Civilization*. Reading, MA: Addison-Wesley.

Marr, B., Schiuma, G., and Neely, A., 2004. "Intellectual capital – defining key performance indicators for organizational knowledge assets", *Business Process Management Journal,* Vol. 10, No. 5, pp. 551-569.

OECD and Eurostat, 2005. *Oslo manual: Guidelines for collecting and interpreting innovation data*. Paris: OECD.

Porter, M.E. (2001). "Strategy and the Internet", *Harvard Business Review*, Vol. 79 No. 3, p. 63.

Shavelson, Richard J. And Others, 1991. "What Are Educational Indicators and Indicator Systems?" In *ERIC Clearinghouse on Tests Measurement and Evaluation Washington DC*. Available at: http://files.eric.ed.gov/fulltext/ED338701.pdf (accessed 16-11-2017).

Simply Docs, 2017. "Different types of business documents available". Available at: https://blog.simply-docs.co.uk/2013/09/23/different-types-of-business-documents-available/ (accessed 11-01-2018).

Sustainable Water Resources Roundtable, 2007. "National Indicators Draft Framework". In Draft Statistical Compendium to Populate the Framework. Available at: https://acwi.gov/acwi-minutes/acwi2008/slide.lib/SWRR-Indicators-Feb05Draft-Part1and2combined_new.pdf (accessed 09-01-2018).

Terlaak, A. and King, A., 2006. "The Effect of Certification With the ISO 9000 Quality Management Standard: A Signaling Approach". *Journal of Economic Behavior & Organization*. Available at: http://faculty.tuck.dartmouth.edu/images/uploads/faculty/andrew-king/ISO_9K_Signaling.pdf (accessed 11-01-2018).

The Open University, Human Research Ethics Committee, 2014. *Ethics Principles for Research Involving Human Participants.* Available at: https://www.open.ac.uk/research/sites/www.open.ac.uk.research/files/files/ecms/research-pr/web-content/Ethics-Principles-for-Research-involving-Human-Participants.pdf (accessed 11-01-2018).

UNESCO Regional Bureau for Science and Culture in Europe, 2009. *Sustainable Tourism Development in UNESCO. Designated Sites in South-Eastern Europe,* United Nations Environmental Programme.

United Nations Environment Programme Division of Technology, Industry and Economics and World Tourism Organization, 2005. *Making Tourism More Sustainable, A Guide For Policy Makers*. Available at: http://www.unep.fr/shared/publications/pdf/dtix0592xpa-tourismpolicyen.pdf (accessed 12-01-2018)

Urry, J., 2003. *Global Complexity*. Cambridge, UK: Polity Press.

Urry, J., 2005. "The Complexity Turn." *Theory, Culture and Society*, Vol. 22, No. 5, pp. 1–14.

World Tourism Organization, 2005. *Making Tourism More Sustainable. A guide for Policy Makers,* United Nations Environmental Programme.

World Tourism Organization, 2007. *Sustainable Tourism Indicators and Destination Management.* Available at: http://sdt.unwto.org/sites/all/files/pdf/finrep.pdf (accessed 11-01-2018)

World Tourism Organization, 2016. Destination Management and Quality Programme: Conceptual Framework. Available at: http://destination.unwto.org/content/conceptual-framework-0 (accessed 11-01-2018)

18 Annex 1: The methodology for the intial selection of indicators

18.1 Basic definitions

Before proceeding with the presentation of the methodology and to give meaningful answers to the research questions, it is primarily vital to develop certain essential definitions of the key words and concepts: touristic destination, indicator, monitoring, selection criteria and indicator system. As we proceed to this analysis, we will recommend methods and techniques to collect the proper information, with the purpose to ultimately define the indicators that better suit the aims of activity A3.6 and in general, the rationale of CASTWATER.

18.1.1 What is a touristic destination?

There are different definitions of tourism destination, a concept that can be considered the founding stone of tourism in general. More precisely, UNWTO defines tourism destination in the following way (World Tourism Organization, 2016):

> "1. Tourism Destination:
>
> A physical space with or without administrative and/or analytical boundaries in which a visitor can spend an overnight. It is the cluster (co-location) of products and services, and of activities and experiences along the tourism value chain and a basic unit of analysis of tourism. A destination incorporates various stakeholders and can network to form larger destinations. It is also intangible with its image and identity which may influence its market competitiveness."

Readers of this document can see that there are three components in the definition of a tourism destination. On the one hand, it is a physical space where visitors can spend an overnight, it concentrates products and services that provide experiences to the visitor, and has its own image and identity that distinguishes it from other locations. Other definitions are similar, as, for example, the following (Beritelli, 2009):

> "A destination is a geographical area consisting of all the services and infrastructure necessary for the stay of a specific tourist or tourism segment. Destinations are the competitive units of incoming tourism and are, therefore, an important part of a tourism product."

Based on the above, this analysis will result in the conclusion that, for the purposes of the CASTWATER project, a destination is defined as a geographic area that is currently or potentially attractive to visitors/tourists, promoted and advertised accordingly, with a range of facilities and products for tourism purposes and the possibility to measure the visitor economy. CASTWATER partners are based in touristic areas where the economy is directly influenced by tourism and related activities, and, in particular, water consumption. Through this project, the destinations will gain information on water efficiency needs of tourism SMEs, enabling policy-makers to assess their significance.

18.1.2 Improving water sustainability in SMEs of MED tourism destinations

As per the CASTWATER key notion, since private sector businesses and SMEs are the main providers of tourism services in Mediterranean tourism destinations within the European Union, there is a wide range of measures that public authorities can take to support businesses and SMEs in their efforts to provide tourism services. Within this range, one can find measures akin to water efficiency, such as (United Nations Environment Programme and World Tourism Organisation, 2005):

• Measures improving the quality of water resources in the destination thereby increasing visitor fulfilment.

• Measures encouraging the adoption of environmental management systems by enterprises, in order to ensure the equitable and efficient use of resources, such as water, thereby respecting community needs and promoting visitor satisfaction.

• Human resource management, to make sure that both public authorities' and tourism SMEs' personnel have the necessary knowledge, skills and competences to support and advance efficient water management in tourism destinations.

• Awareness raising campaigns to ensure that both tourism SMEs' personnel and tourists are familiar with the need to preserve water resources in tourism destinations.

• Measures influencing the behaviour of tourists, or more precisely encouraging the adoption of technologies and notification systems that give tourists the opportunity to use less water.

Nevertheless, this great range of measures will be fruitless if public authorities cannot develop a proper understanding of water efficiency in tourism businesses within

Mediterranean destinations. To develop such an understanding, it is necessary to put in place an efficient monitoring system based on the collection of specific types of data pertaining to indicators capable of shedding light to the issue of water efficiency.

18.1.3 What is Monitoring?

To know the—potential or realized—success or failure of measures promoting and advancing water efficiency in tourism, it is necessary to implement a monitoring process, i.e. a process of constantly checking the realized progress in the implementation of the goals, objectives and work program of entrepreneurial or policy plans to support water efficiency in tourism (UNESCO Regional Bureau for Science and Culture in Europe, 2009). Through the checking process, public authorities will be able to evaluate the implementation of water efficiency measures by SMEs based on actual data, thereby achieving the aims of activity A3.6.

To establish an efficient monitoring process, it is necessary to take into account the fact that such processes can be analysed in the following consecutive steps (UNESCO Regional Bureau for Science and Culture in Europe, 2009):

1. Data collection: Data collection is the basis of any efficient monitoring process. The reason is that without collecting the appropriate data both in terms of quality and quantity, public authorities will not be able to develop an appropriate understanding of water efficiency in tourism businesses and SMEs, and will not be able to improve the sustainability of water in tourism within CASTWATER regions. To make sure that the data collected through checks are the appropriate ones, it is necessary to install standardized data collection processes that 'produce' data that can be used to estimate the value of indicators suitable for understanding water sustainability in tourism.
2. Evaluation: Evaluation can be considered the moment of truth for any monitoring process. Through evaluation, data collected through checks are assessed and evaluated and the first picture of the issue under investigation is formed. Evaluation should be based on comparing and calculating the values of suitable indicators with coherence, to ensure that the understanding developed is representative of the actual conditions.
3. Reporting: Reporting is the means by which the understanding of water sustainability in tourism SMEs can be articulated in a comprehensive way and

communicated to all relevant public and private stakeholders so as to inform their strategy. The reporting system should be able to consider changes occurring gradually in the course of time.

Within this context, it is crucial to highlight that in 2013 the European Commission had launched the European Tourism Indicator System (ETIS, updated in 2016), aiming to assist destinations to monitor and measure their sustainable tourism performance in general, by using a common comparable approach. Specific touristic destinations have tested ETIS, with impressive findings, both for the regions and the tool itself. While ETIS provided them with the fundamental information they required in order to monitor sustainability, it also played a significant role in managing tourism activity more effectively. Accordingly, we are going to use a similar methodological approach, to the extent that is appropriate for the purposes of CASTWATER in order to develop an Indicator System that will focus on tourism policies and practices on water efficiency in the CASTWATER regions. Before articulating this methodological approach, however, it is necessary to provide the definitions of indicators and indicator systems that can be used to assess water sustainability.

18.1.4 Indicators and indicator systems

What is an indicator?

An indicator is an observed value representative of a phenomenon of study. In general, indicators quantify information by aggregating different and multiple data. The resulting information is therefore synthesized. Indicators simplify information thereby assisting the development of an understanding of complex phenomena (European Environment Agency, 2000). By quantifying phenomena and simplifying complex realities, indicators are able to rapidly provide key information about important factors to support decision-making and promote public awareness regarding the issues with which they relate.

In simple words, indicators are basically used to warn about areas of concern so that action can be taken early enough. In our case, water sustainability in tourism currently lacks a complete and organized system that can serve as a warning, and, as a result, ends up finding out problems too late – usually in the form of excessive waste of water. As indicators are measures of important factors that are crucial for decision-makers, in order for them to reduce the risks, certain information or data sets are essentially potential indicators. To avoid getting lost in a wide range of impractical information, it is sensible to select the right indicators, according to the goals and the relative priorities of CASTWATER. Each region can

choose the most relevant indicators they wish to adopt and monitor, in order to meet their local needs, the interest of local stakeholders and the specific water sustainability issues that each of them faces in their local tourism industry (European Commission, 2016).

In Table 11, we see three very well-defined indicators that set three issues relevant to water sustainability in tourism: the comparison between tourists' water consumption and the locals, the percentage of the tourism enterprises that act with the view to reduce their water consumption and the percentage of the tourism enterprises that actually use recycled water

Table 11: Indicators: an example from ETIS (European Commission, 2016, p.22)

D.5 Water management	D.5.1	Water consumption per tourist night compared to general population water consumption per resident night
	D.5.2	Percentage of tourism enterprises taking actions to reduce water consumption
	D.5.3	Percentage of tourism enterprises using recycled water

What is an Indicator System?

Single indicators are only rarely meaningful enough to provide useful information for complex phenomena. Instead, it is necessary to use more than one indicator to develop a basic understanding of such phenomena. However, using multiple indicators without organizing their evaluation means that important information about a phenomenon such as the use of water in tourism might not be detected. To avoid that, multiple indicators are organized as indicator systems. Indicator systems are usually designed to generate more and more accurate information about specific conditions in complex phenomena and are more than just a collection of indicator statistics. Ideally, a system of indicators measures distinct components of the system and also provides information about how each individual component work with others to produce the overall effect. As a result the whole of the information provided by a system of indicators is greater than the sum of information provided by unorganized assemblages of indicators ((European Commission, 2016).

Therefore, an Indicator System is a locally owned and led process utilizing a number of indicators for collecting and analyzing data with the overall objective to assess the impact of tourism on water management at specific destinations. The indicators can serve as a management tool, based on self-assessment, observations, data collection and analysis by the destinations themselves. Essentially, the objective is to improve the sustainable

management of water by measuring their relevant processes and monitoring their performance and progress over time.

To adapt this analysis to the needs of CASTWATER activity A3.6, in the following figure, readers can see certain thematic categories of indicators relevant to the issue of water efficiency in the tourism sector. These domains concern the amount of water that is available for consumption and use in the tourism sector, the quality of the water used in the tourism sector, people's benefits, effects on ecosystems and the current infrastructure's ability to affect water sustainability. The thematic categories were based on the ETIS toolkit of the EU, and the National Indicators Draft Framework of the USA (Sustainable Water Resources Roundtable, 2007).

Table 12: Suggestive water-related indicator categories

Indicator category	Description	Types of indicators to be included
Water availability	Amount of water available to be allocated for human and ecosystem uses.	Water use sustainability: measures of the degree to which water use meets current needs of the tourist industry while protecting ecosystems
Water quality	Composite measures of the suitability of water quality for human and ecosystem uses.	Water quality sustainability: composite measures of the degree to which water quality satisfies the tourist industry's human and ecosystem needs.
Human uses and health	People 's benefits from the use of water and water-dependent resources	Human uses of water in the environment: the extent to which tourist SMEs use water resources for waste assimilation, transportation and recreation.
Environmental health	Effects of water use in the conditions of ecosystems	Indices of the health of ecosystems adjacent to touristic areas
Infrastructure and institutions	The infrastructure and institutions enable the sustainable use of water	Capacity and reliability of tourism industry's infrastructure to meet human and ecosystem needs. Efficacy of institutions in the field of tourism in managing water resources sustainably.

18.1.5 Which are the criteria for selecting and reviewing indicators?

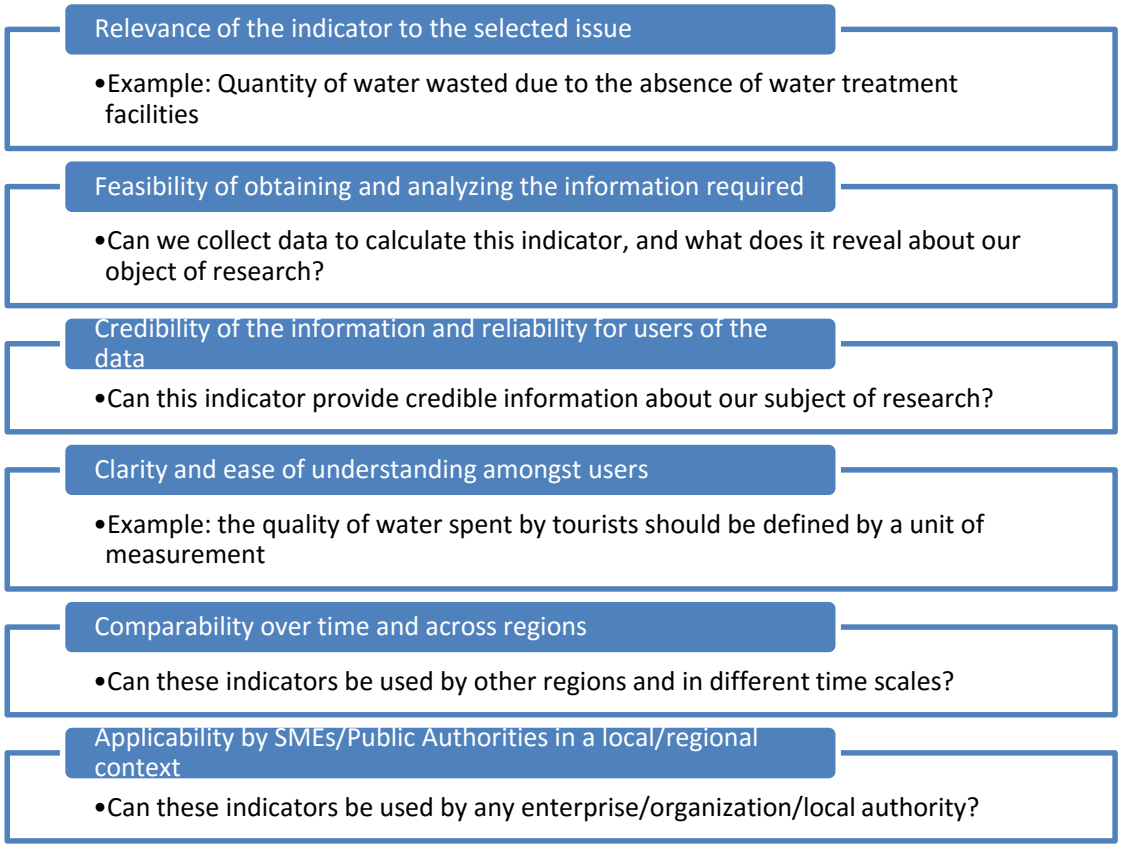
Identified as a significantly critical question in our research, activity A3.6 involves the selection, validation, and consolidation of comprehensive evaluation criteria for public authorities to comparatively assess the MED touristic areas in regards to sustainable tourism water management. The purpose of these indicators is to support local/regional water capacity assessments and water use audits in the tourism industry. Specifically, an indicator system should support the following tasks:

- Provide guidelines to the researchers

- Confine the area of varieties that touch the research subject
- Define the characteristics of the research subject and set it apart from other phenomena
- Assist in revealing the parameters of a current status

Hence, the classification of specific criteria used for the selection of the proper indicators that will support the procedure, is considered crucial. The following figure provides the criteria for the selection of indicators in the CASTWATER project (Diamantis, 2004, pp. 83-84):

Figure 5: Indicator selection criteria and clarifications



In the data collection tool, provided in Annex 1, partners will have to rank each of the indicators they propose to include in the final list according to the extent to which they meet the criteria found in Table 4. It is important that the indicators and the data are regularly reviewed and that additional supplementary indicators are included when possible, as appropriate to the destination. Through frequent updates, it can be clear whether the information is making a difference, it is possible to determine whether the issues have changed, to consider any practical issues associated with the usability of specific indicators, and whether new sources of data might permit alternative indicators to be used.

18.2 Methodological approach

The methodological approach of this study is specifically designed to answer the research questions in a way that leads up to the successful completion of activity A3.6, i.e. the development of an online water sustainability assessment tool. As the first stage for the formation of this tool, the methods outlined below will initiate the development of an Indicator System that can be used to assess existing sustainable tourism policies and practices on water efficiency in the coastal zones of the Mediterranean. It is for this exact reason (i.e. the identification of all existing best practices and the development of an overview of the best uses of water sustainability indicators) that the main method used in this enquiry will be the desk research.

Desk research is a method capable of delivering a fast and reliable overview of a large number of best practices by assessing rapidly a large number of (primary or secondary) sources, albeit with the caveat of having to assess and integrate the perspectives & feedback of these sources in the research. It is an efficient and cost-effective way to capitalize on already existing knowledge which does not require specialized personnel. Thus, the collection of all the relevant information about the indicators related to water consumption in touristic coastal areas of the Mediterranean, becomes a lot easier. Desk research that retrieves secondary data bears the advantage of providing perspectives based on already analyzed and validated data. Hence, it can help accelerate this research by offering ready to be used rationale and categories to the data that needs to be collected. On the other hand, if researchers rely completely on secondary data, there is always the danger of developing a biased perspective of the issue at hand due to the different objectives of past research.

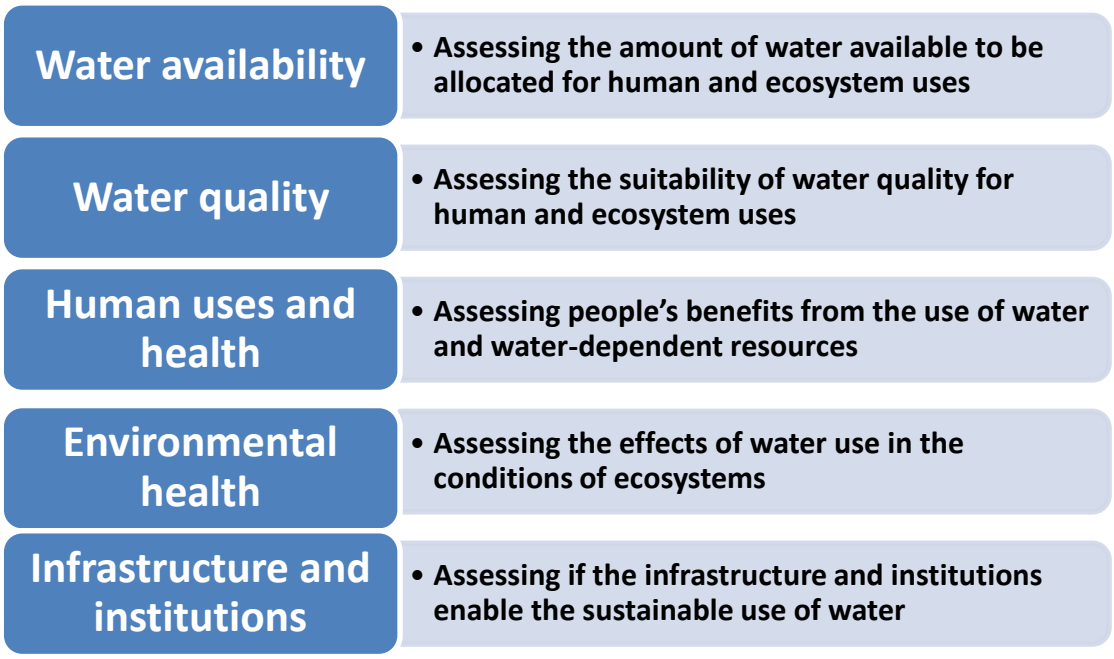
Desk research used in A3.6 data collection will consist of both external and internal desk research. External desk research involves research conducted outside the organizational boundaries and collecting relevant information. It is almost always comprised by secondary data research, during which researchers have to read and examine various texts that usually contain data congruent with the rationale of various institutions and/or researchers. In the case of CASTWATER, external desk research refers to data collection based on documents and/or other resources (e.g. video and audio files) produced by organisations other than the CASTWATER partners. Due to the immense availability of data in the internet, external desk research will consist of Online Desk Research. It's important for CASTWATER partners to look for specific information online as there are billions of pages available on internet. There are three approaches for digging out the relevant information from the internet, outlined below.

Internal desk research, on the other hand, refers to the collection of data by members of one organization within their organization. In these data, specific indicators, relevant to our research questions could be located, facilitating the whole process enormously. These data are easily accessible and this is the reason why researchers conducting desk research should consider finding data within their own organizations as one of the starting points of their research. If CASTWATER partners have already regulated or participated in a relevant project, they should have reacted to the existing regulation that defines policies in relation to these projects. Their interactions with this regulation (which they have either formed or received) should be noticeable in their actions as they are represented by their archives of the following documents. Since CASTWATER partners are institutions directly or indirectly involved in policy making, it is highly possible that they have already produced indicators found in documents, capable of shedding light to the research questions on sustainable water management.

18.3 Data collection methods

Following the methodological approach outlined in the previous section, the first source of data to be collected will be documents available online and retrieved via external desk research. The second source of data will be the internal documents of the CASTWATER partners who may already own a part of the needed information. To facilitate the whole process of data collection, the data collection tools to be filled by partners that incorporate all necessary elements for this research to be successful and accurate, are provided in the annexes. The tool requires partners to find and list water efficiency indicators that measure the tourism SMEs' rate of adoption of water efficiency measures, infrastructure, skills & awareness, and corporate social responsibility initiatives. Partners will have to list 1-4 indicators assessing each of the five key issues determining water efficiency as they are identified in the ETIS list of indicators (European Commission, 2016), and the National Indicators Draft Framework of the USA (Sustainable Water Resources Roundtable, 2007). The five key issues can be seen in the following figure:

Figure 6: Indicator categories assessing key issues determining water efficiency



Partners will have first to provide the name, measurement unit and a short description of the indicators, and then they will have to rank their performance in terms of the selection criteria identified in section 6.4, by providing a number between 1 and 5 (5 is the highest rank) that represents the extent to which each indicator meets each of the selection criteria.

Partners are responsible for filling the tool appropriately, using the methods described in the following sections.

18.3.1 External desk research

The first source of data is comprised by those documents that are publicly available either online or in libraries. Hence, CASTWATER partners will engage in external desk research, which involves research conducted outside the organizational boundaries. It is almost always comprised by secondary data research, during which researchers have to read and examine various texts that usually contain data congruent with the rationale of various institutions and/or researchers. In the case of CASTWATER, external desk research refers to data collection based on documents and/or other resources (e.g. video and audio files) produced by organizations other than the CASTWATER partners. Due to the immense availability of data in the internet, external desk research in CASTWATER activity A3.6 consists of Online Desk Research. There are three approaches for digging out the relevant information from the internet, outlined below.

Utilizing search engines

The first approach is using the various search engines like www.google.com, www.yahoo.com, www.infoseek.go.com, www.altavista.com etc, for modulated searching. The important aspect here is to refine the searching techniques in such a way that results are promising and relevant. For this purpose, it is necessary for the researcher to develop a list of keywords or key phrases based on the research questions outlined above. Thus, in order to use the search engines properly, the researcher must look for these key words or phrases and open all the relevant links that will occur. Finally, if the researcher intends to look for secondary data in academic sources, he/she should search in specialized academic databases such as Google Scholar (www.scholar.google.gr), Science Direct (www.sciencedirect.com) and Jstor (www.jstor.org). The following figure (Table 13) provides an indicative list of such key words and phrases:

Table 13: Key words and phrases for search engines

Key words and phrases
• **Sustainable Water Management**
• **Sustainable Water policies**
• **Sustainable Water management Indicators**

- Sustainability Indicators for Water Management
- Sustainable Tourism Business Management
- Grey Water Management
- Water exploitation in touristic areas
- Water Discharge in Touristic Areas
- Reused Wastewater in Tourism
- Ground Waters and Tourism
- Sustainability Policies in Tourism

Exploring academic journals & books

The second approach indicates that CASTWATER partners should look for data in specialized academic journals which treat the issue of indicators and sustainable water management. Academic journals are essential as sources of data for this research because:

- They can provide detailed information on sustainable tourism and water management in various EU countries, including the ones where CASTWATER partners are based.
- Regardless of the case studies they analyze, they provide a scientific evaluation of policy which can lead to an improved understanding of its strengths, weaknesses and impact.

In the following table, CASTWATER partners can find a non-exhaustive list of such journals:

Table 14: Academic Journals

List of academic journals
Journal of Sustainable Tourism
Tourism in Marine Environments
Business Strategy and the Environment
International Journal of Tourism Sciences
Journal of Hospitality & Tourism Research
Annals of Leisure Research
Annals of Tourism Research
e-Review of Tourism Research

List of academic journals

European Journal of Tourism Research
International Journal of Tourism Policy
International Journal of Tourism Research
Journal of Ecotourism
Journal of Heritage Tourism
Journal of Policy Research in Tourism, Leisure and Events
Journal of Tourism Challenges and Trends
Water Policy
Tourismos: an International Multidisciplinary Journal of Tourism
Journal of Environmental Management
Annual Review of Resource Economics
International Journal of Ecology & Development
Journal of Environmental Economics and Management
Review of Environmental Economics and Policy
Water Resources Research
Aquatic Conservation: Marine and Freshwater Ecosystems
Journal of Hydrology
Water Research
Annual Review of Marine Science

In the following table, a list of online articles and books is recommended, with useful information with regard to sustainable/ efficient water management.

Table 15: Articles & books

USEFUL ARTICLES & BOOKS

Various

Greywater reuse: towards sustainable water management

Integrated Water Resource Management: looking at the whole picture

International Law, Sustainable Development and Water Management

Sustainable water use in Europe. Part 1: Sectoral Use of Water

Sustainable water use in Europe. Part 2: Demand management

Constructed wetlands for the Mediterranean countries: hybrid systems for water reuse and sustainable sanitation

Challenges to Manage the Risk of Water Scarcity and Climate Change in the Mediterranean

Problems of Sustainable Groundwater Management in an Area of Over-exploitation: The Upper Guadiana Catchment, Central Spain

New performance indicators for water management in tourism

Monitoring for a Sustainable Tourism Transition: The Challenge of Developing and using indicators

The Future of Tourism: Can Tourism Growth and Climate Policy be Reconciled? A Mitigation Perspective

Partner Country-specific

Estimating the direct and indirect water use of tourism in the eastern Mediterranean

The problems of sustainable water use in the Mediterranean and research requirements for agriculture

Sustainable management of water resources - France

Towards sustainable water management: Catchment planning in France and Britain

USEFUL ARTICLES & BOOKS

ICSWRM 2017 : 19th International Conference on Sustainable Water Resources Management

Review of the International Water Resources Management Policies and Actions and the Latest Practice in their Environmental Evaluation and Strategic Environmental Assessment - France

Developing Partnerships for Sustainable Water Management and Agriculture in the context of Climate and Global Change

Tourism and sustainable water supply in Mallorca: a geographical analysis

Making the Most of the Water We Have: The Soft Path Approach to Water Management

Water supply modeling towards sustainable environmental management in small islands: the case of Paros, Greece

Sustainable Tourism Indicators: Pilot Estimation for the Municipality of Hersonissos, Crete

Water resources management in the Island of Crete, Greece, with emphasis on the agricultural use

Sustainable tourism management in Crikvenica, Croatia: An assessment of policy instruments

Water resources and waste water management in Bosnia and Herzegovina, Croatia and the State Union of Serbia and Montenegro

Multicriterion Analysis for Sustainable Water Resources Planning: A Case Study in Spain

Environmental indicators to evaluate spatial and water planning in the coast of Granada (Spain)

Multicriterion Analysis for Sustainable Water Resources Planning: A Case Study in Spain

Hotel water consumption at a seasonal mass tourist destination. The case of the island of Mallorca

Role of water reuse for enhancing integrated water management in Europe and

USEFUL ARTICLES & BOOKS

Mediterranean countries

Browsing Expert Websites

The third approach is browsing the specific information from governmental, industrial, marketing or business sites and extracting the information out of them. Especially government agencies usually publish a great extent of social, financial and economic data, usually online, which can be used in the research process. The greatest advantages of researching government published data are accessibility and quality of information. In the case of CASTWATER activity A3.6, data published by the European Union could also be a highly important source, since regional policies with regards to sustainable tourism and water management are determined to a greater or smaller extent by EU initiatives. Hence, researching government and EU published data could be the ideal cost-effective medium of gathering information. A non-exhaustive list of suggested websites and pages that contain relevant information for this research is presented in Table 10 below.

Table 16: Expert web sites

Examples of Information in Expert Web Sites
European Commission
Sustainable tourism
European Tourism Indicators System for sustainable destination management
Coastal and maritime tourism
Defining, measuring and evaluating carrying capacity in European tourism destinations
Study on the feasibility of a European tourism indicator system for sustainable management at destination level
Network of European Regions for a Sustainable and Competitive Tourism
www.necstour.eu
World Tourism Organization
http://sdt.unwto.org
Sustainable Tourism Indicators and Destination Management
Institute of Applied and Computational Mathematics
Sustainable Tourism Indicators for Mediterranean Established Destinations
Water In Core
Sustainable Water Management through Common Responsibility enhancement in Mediterranean River Basins
United Nations Environment Programme
Making tourism more sustainable. A guide for policy makers
UN Environment
UNESCO
Sustainable Tourism Development in UNESCO. Designated Sites in South-Eastern Europe
INTERNATIONAL INSTITUTE FOR SUSTAINABLE DEVELOPMENT
www.iisd.org
Indicators for the sustainable management of tourism
Sustainable Travel International
www.sustainabletravelinternational.org
ADRIATIC GREEN NET
Indicators of sustainable development for tourism destinations
Malta
The EU Environmental Implementation Review. Country Report - MALTA

France
Water management in France
The EU Environmental Implementation Review Country Report - FRANCE
Croatia
Water management on the Drava and Mura in Croatia in line with EU environmental legislation
Transnational integrated management of water resources in agriculture for European water emergency control
The EU Environmental Implementation Review Country Report - CROATIA
Cyprus
Management of Water Resources in Cyprus
Management of water in Cyprus
The EU Environmental Implementation Review Country Report - CYPRUS
Greece
Sustainable water management
Water Management and Protection in Greece
The EU Environmental Implementation Review Country Report - GREECE
Italy
The EU Environmental Implementation Review Country Report - ITALY
Spain
The EU Environmental Implementation Review Country Report - SPAIN

18.3.2 Internal desk research

The second source of data will be the internal documents of the CASTWATER partners and will be utilized if this type of data is available. What this means, is that this method is applicable only if the partners have used relevant indicators in the past. The rationale for focusing on internal documents as a source of data lies in the immense value of documents in case study research, and their usefulness as a standalone method for specialized forms of qualitative research. The possibility of locating previous studies that have used similar indicators is very high, considering that water sustainability is an issue that has preoccupied some Mediterranean coastal areas in the past.

As a research method, document analysis is particularly applicable to qualitative case studies—intensive studies producing rich descriptions of a single phenomenon, event,

organization, or program. Non-technical literature, such as reports and internal correspondence, is a potential source of empirical data for case studies; for example, data on the context within which the participant operates. More precisely, documents of all types can help significantly the researcher discover meaning, develop understanding, and shed light to the research problem. In fact, for cross-cultural research, relying on prior studies could prove to be the only realistic approach.

During internal desk research, CASTWATER partners should focus on deriving data from the following categories of documents:

Reports

Business reports convey information in a format that is more formal and usually longer than a letter. Reports cover a variety of topics, such as safety compliance, sales figures, financial data, feasibility studies and marketing plans. They may include statistics, charts, graphs, images, case studies and survey results. Some reports are published for the benefit of investors. If a report is periodic, such as a monthly sales report, a template is used for convenience and to enable comparison with previous reports (Hearst Newspapers LLC, 2018).

Business reports can provide data about the official position of the partners with regards to specific policies, as well as provide information about specific data or the overall strategy of partners in relation to water management.

E-mails and Memoranda

Co-workers typically use email to convey information to each other. Before email became prevalent, memorandums were used for intraoffice messages. Memos are still used in situations where a message is meant to accompany a specific file and in cases that require more privacy than an email. Both a memo and an email identify the sender and recipient and contain a subject line. The text is formatted in one or more paragraphs.

E-mails and memos can provide information about how the CASTWATER partners' personnel are affected by the policies designed to support the sustainable water management projects in which they might participate.

Letters

Business letters are used to communicate with individuals outside of the office. Recipients may include customers, colleagues in other businesses, service providers, professionals who advise the business, government officials and job applicants. A business letter is usually formatted in block style, in which all of the elements of the letter, except the letterhead, are aligned with the left margin. It can be emailed or delivered by mail. If a letter is sent in the text of an email, the sender includes his name, job title and contact information at the bottom of the email.

Letters can be used to see how partners try to take advantage or overcome obstacles of existing policies during their interactions with other collaborators in water management projects.

Transactional Documents

An organisation uses documents to transact business with others. To save time, these documents may be organized as a form, such as an order form, transmittal page, invoice or receipt. The types of transactional documents used vary somewhat by the nature of a business. An insurance agent, for example, generates insurance applications and policies, while a lender uses loan applications and mortgage documents. In some fields, businesses enter into agreements and contracts with others; these documents might be drafted by the company's lawyer.

Transactional documents can provide data about the business methodology of an organization and, as a result, the state of the implementation of water efficiency measures.

Financial Documents

A business uses financial documents to prepare budget proposals, stay within its budget, and file tax returns. These documents include receipt records, payroll reports, paid bills, bank statements, income statements, balance sheets and tax reporting forms and they may be prepared by the company's accountant. A business owner uses these documents to determine the financial success of the company and to identify areas that are unproductive. A department head might use financial documents to prepare a budget proposal.

Financial documents are especially important for gathering data about the impact of existing policies concerning water management.

Business plans along with business goals

Business plans are documents that draw up organisations' goals and objectives. The business plan will generally include a management plan, along with a budget and possibly marketing strategies. During the first few years, a business plan is essential as it provides a blueprint and has strategic goals for the business to meet (Simply Docs, 2017).

In the case of touristic SMEs and their management of water, business plans can reveal their intentions for improving water efficiency and can be used alongside other sources of data to estimate the efficiency of the implementation of water management measures.

Legal documents addressing efficient water management

This type of documents refers to those legal texts that either certify the efficiency of water management in a touristic SME or provide evidence for the implementation of various types of water efficiency measures. Examples of categories of such documents include the following (DailyWritingTips, 2017):

1. Certificates: documents attesting that something is true or someone is qualified to do something, e.g. that an SME has already applied water efficiency measures.
2. Charters: written contracts, instruments, grants or guarantees, that define conditions, privileges, or rights, or a lease of all or part of a vessel, or, as a verb, to confer such an agreement, or to offer for hire. In the case of water efficiency in tourism, a charter can refer to defining conditions for water efficiency in various aspects of the function of tourism SMEs.
3. Guarantees: a written or stated agreement about possessing or using something or about the longevity or quality of a product, or the agent of such as agreement, or, as a verb, to provide such an agreement. In the case of water efficiency in tourism, a guarantee can refer to the longevity or quality of water efficiency equipment.
4. Licenses: a document or other item that is evidence of the granting of a license, or the authority to engage in an activity, or assignment of some or all rights by a patent or copyright holder to another, or, as a verb to grant such a document. With regards to water efficiency in tourism, public authorities could provide tourism SMEs with the necessary licenses to take specific water efficiency measures.
5. Warrants: a document assigning authority to do or act, or, as a verb, to assure, declare, or guarantee. With regards to water efficiency in tourism, warrants may refer to the assigning public authorities the responsibility to control water efficiency in the tourism sector according to specific criteria.

Finally, since internal research necessarily includes accessing the personal files of employees within CASTWATER partners, those in charge of the research should make sure that they and their personnel abide by the following research ethics' rules (The Open University, Human Research Ethics Committee, 2014):

Table 17: Internal desk research ethics

Principle 1: Compliance with protocol.
•CASTWATER partners' employees should be aware of the range of research ethics on the subject of how valid consent to participate is sought, gained and recorded, how data are collected, stored and accessed, and how participants are informed of their rights within the study. The only exception to this requirement shall be where any reasonable judgement would suggest that no harm could possibly arise to any person, living or dead, in connection with the proposed research.
Principle 2: Valid consent
•Owners of documents used in the research should always be informed in advance and in understandable terms of any potential benefits, risks, inconvenience or obligations associated with the research that might reasonably be expected to influence their willingness to participate. Consent should always be gained in a consistent manner. This should normally involve the use of an information sheet about the research and what participation will involve, and a signed consent form.
Principle 3: Openness and integrity.
•Researchers should be open and honest about the purpose and content of their research and behave in a professionnal manner at all times.
Principle 4: Maximising benefit and protection from harm
•Researchers should make every effort to maximise the benefits of research while minimising the risks of any harm, either physical or psychological, arising for any participant, researcher, institution, funding body or other person or community.
Principle 5: Confidentiality
•Except where explicit written consent is given to reveal identities, researchers should respect and preserve the confidentiality of the identities and data of the owners of documents.
Principle 6: Professional codes of practice and ethics.
•Where the subject of a research project falls within the domain of a professional body with a published code of practice and ethical guidelines, researchers should explicitly state their intention to comply with this code and guidelines.

18.4 Data analysis methods

After data collection, data analysis will have to be carried out in order to finalise the list of indicators. The data analysis will be based on a) the ranking of indicators provided in the data collection tool, as per the instructions of section 8, and b) the open coding method for the short descriptions of indicators. Obviously, to be included in the finalized list of indicators, the indicators will have to get at least 3/5 in all selection criteria cited in table 4.

On the other hand, open coding will be used to assess the comments of researchers provided in the short description sections of the data collection tool. Data analysis of short descriptions is absolutely necessary, since different people from different organizations are going to rank diverse indicators. Hence ranking patterns might vary among partners. To overcome this challenge, open coding will allow for an evaluation of the indicators using a different source of data to the ranks. Open coding is a type of data analysis and evaluation that is not guided by researchers' theoretical assumptions, but by the data per se. Researchers do not pick and code the patterns that fit their own theoretical assumptions, but on the contrary, they have to identify, note and code all patterns that emerge from the data, even if they contradict the researchers' assumptions. To achieve this, they will do the following:

a) Read through the data several times
b) Start creating tentative labels for chunks of data that summarize the phenomena described therein (not based on existing theory – only based on the meaning that emerges from the data), and for the indicators that best represent them.
c) Step (b) leads to the development of a simple system of codification for the patterns that they found and the corresponding indicators that they will choose.

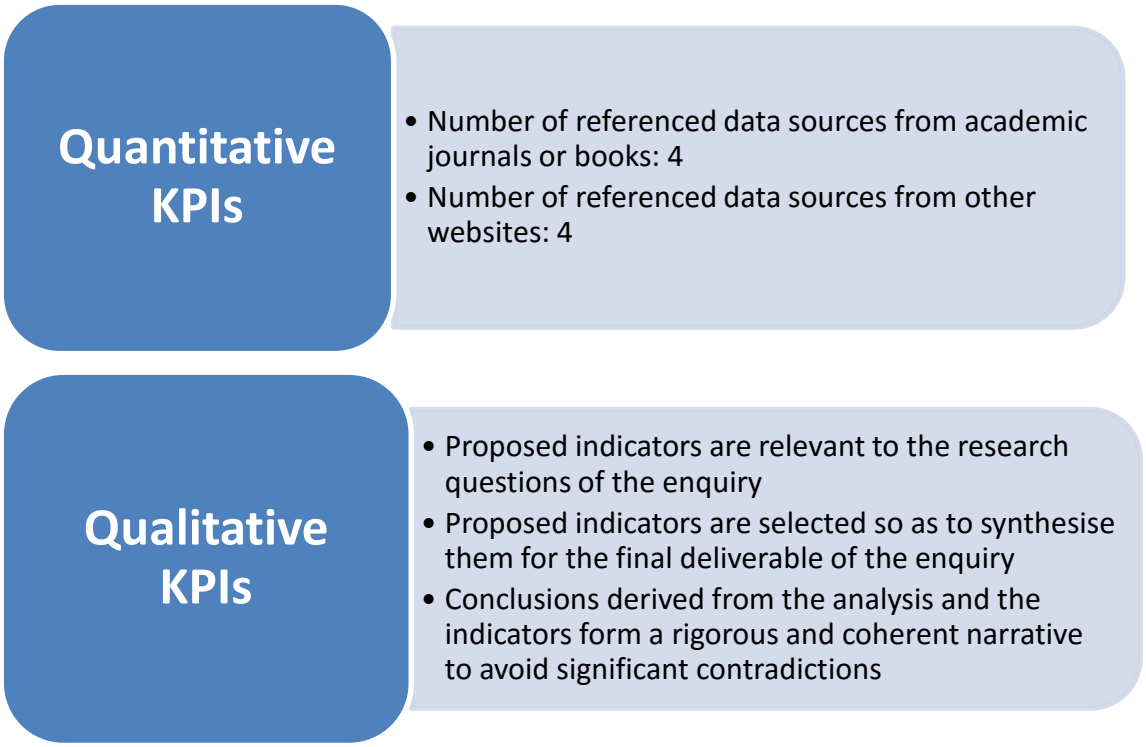
After collecting data up to the point of saturation, i.e. up to point where more research does not provide data with significantly different additional information, partners will have to assemble all data in the same form. Since written text is one of the easiest forms of data to analyze, all data in video or audio form found online (if there are any) should be summarized into additional documents. After assembling all data, partners will have to read through them several times and then start to match similar data and create categories for chunks of data that summarize various indicators of sustainable water management. Finally, all categories emerging from the data should be codified for easier reference at later stages of the research. Since this research relies on open coding, codes will emerge from reading and

analyzing the data. Special attention should be given to the fact that desk research data are data derived from secondary sources.

18.5 Quality specifications

To achieve the aims of this research, it is necessary to abide by specific quality criteria. If CASTWATER partners do not conduct the research by respecting these criteria, it is possible that the data collected will be of low quality or irrelevant. Quality criteria for this research comprise a number of quantitative and qualitative key performance indicators.

Figure 7: Key performance indicators



19 Annex 2: Data collection tools

19.1 Data collection tool for indicators used in tourism SMEs' self-assessment

Project CASTWATER									
Activity A3.6 Data collection tool									
Name of partner									
Region									
Country									
External desk research data sources (links list)				**Internal desk research data sources (type & description of documents)**					
Indicator Category: Water availability			**Category description: Amount of water available to be allocated for human and ecosystem uses**						
#	*Indicator name*	*Indicator description* (Short description of the indicator and how it can be used - approx. 100 words)	*Measurement unit*	Relevance (to the selected issue)	Feasibility (of obtaining and analyzing the information required)	Credibility (of the information)	Clarity (ease of understanding amongst users)	Comparability (over time and across regions)	Applicability (by SMEs/Public Authorities in a local/regional context)
1				1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
2				1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
3				1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
4				1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Indicator Category: Water quality			**Category description: Composite measures of the suitability of water quality for human and ecosystem uses**						
#	*Indicator name*	*Indicator description* (Short description of the indicator and how it can be used - approx. 100 words)	*Measurement unit*	Relevance (to the selected issue)	Feasibility (of obtaining and analyzing the information	Credibility (of the information)	Clarity (ease of understanding amongst users)	Comparability (over time and across regions)	Applicability (by SMEs/Public Authorities in a local/regional

										require)																				context)				
1				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
2				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
4				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Indicator Category: Human uses and health			**Category description: People's benefits from the use of water and water-dependent resources**																														
#	*Indicator name*	*Indicator description* (Short description of the indicator and how it can be used - approx. 100 words)	*Measurement unit*	Relevance (to the selected issue)					Feasibility (of obtaining and analyzing the information require)					Credibility (of the information)					Clarity (ease of understanding amongst users)					Comparability (over time and across regions)					Applicability (by SMEs/Public Authorities in a local/regional context)				
1				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
2				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
4				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Indicator Category: Environmental health			**Category description: Effects of water use in the conditions of ecosystems**																														
#	*Indicator name*	*Indicator description* (Short description of the indicator and how it can be used - approx. 100 words)	*Measurement unit*	Relevance (to the selected issue)					Feasibility (of obtaining and analyzing the information require)					Credibility (of the information)					Clarity (ease of understanding amongst users)					Comparability (over time and across regions)					Applicability (by SMEs/Public Authorities in a local/regional context)				
1				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
2				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
4				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Indicator Category: Infrastructure and institutions			**Category description: The infrastructure and institutions enable the sustainable use of water**																														
#	*Indicator name*	*Indicator description*	*Measurement*	Relevance (to					Feasibility (of					Credibility (of					Clarity (ease of					Comparability					Applicability (by				

		(Short description of the indicator and how it can be used - approx. 100 words)	*unit*	the selected issue)					obtaining and analyzing the information require)					the information)					understanding amongst users)					(over time and across regions)					SMEs/Public Authorities in a local/regional context)				
1				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
2				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
4				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5

19.2 Data collection tool for indicators used for monitoring by public authorities

Project CASTWATER									
Activity A3.6 Data collection tool: water sustainability in tourism indicators for Public Authorities									
Name of partner									
Region									
Country									
External desk research data sources (links list)						**Internal desk research data sources (links list)**			
Indicator Category:			**Category description:**						
Water availability			**Amount of water to be allocated for human vs. ecosystem uses:** Indicators providing information on the amount of water available to be used in tourism, and potential water shortages in the ecosystems of tourism destinations.						
#	***Indicator name***	***Indicator description*** **(Short description of the indicator and how it can be used - approx. 100 words)**	***Measurement unit***	**Relevance (to the selected issue)**	**Feasibility (of obtaining and analyzing the information required)**	**Credibility (of the information)**	**Clarity (ease of understanding amongst users)**	**Comparability (over time and across regions)**	**Applicability (capability to be used by public authorities)**

1				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5
																													Regional authorities	1	2	3	4	5
																													National authorities	1	2	3	4	5
2				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5
																													Regional authorities	1	2	3	4	5
																													National authorities	1	2	3	4	5
3				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5
																													Regional authorities	1	2	3	4	5
																													National authorities	1	2	3	4	5
4				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5
																													Regional authorities	1	2	3	4	5
																													National authorities	1	2	3	4	5

Indicator Category:	**Category description:**
Water quality	**Water quality:** **Indicators measuring the impact of tourism development on the water quality used in tourism SMEs and/or discharged by them back into**

			ecosystems.																												
#	***Indicator name***	***Indicator description*** **(Short description of the indicator and how it can be used - approx. 100 words)**	***Measurement unit***	**Relevance (to the selected issue)**					**Feasibility (of obtaining and analyzing the information required)**					**Credibility (of the information)**					**Clarity (ease of understanding amongst users)**					**Comparability (over time and across regions)**					**Applicability (capability to be used by public authorities)**					
1				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5
																													Regional authorities	1	2	3	4	5
																													National authorities	1	2	3	4	5
2				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5
																													Regional authorities	1	2	3	4	5
																													National authorities	1	2	3	4	5
3				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5
																													Regional authorities	1	2	3	4	5
																													National authorities	1	2	3	4	5

4				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5
																													Regional authorities	1	2	3	4	5
																													National authorities	1	2	3	4	5

Indicator Category:	**Category description:**
Human uses and health	**Expected tourism sector benefits:** **Indicators estimating the positive impact of the adoption of measures for sustainable water use in the tourism sector.**

#	***Indicator name***	***Indicator description*** **(Short description of the indicator and how it can be used - approx. 100 words)**	***Measurement unit***	**Relevance (to the selected issue)**					**Feasibility (of obtaining and analyzing the information required)**					**Credibility (of the information)**					**Clarity (ease of understanding amongst users)**					**Comparability (over time and across regions)**					**Applicability (capability to be used by public authorities)**					
1				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5
																													Regional authorities	1	2	3	4	5
																													National authorities	1	2	3	4	5
2				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5
																													Regional authorities	1	2	3	4	5

																													National authorities	1	2	3	4	5
3				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5
																													Regional authorities	1	2	3	4	5
																													National authorities	1	2	3	4	5
4				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5
				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Regional authorities**	1	2	3	4	5
																													National authorities	1	2	3	4	5

Indicator Category:	**Category description:**
Environmental health	**Expected ecosystem benefits:** **Indicators measuring the positive impact of the adoption of sustainable water use measures by the tourism sector on ecosystem conditions (e.g. decrease of pollution)..**

#	***Indicator name***	***Indicator description*** **(Short description of the indicator and how it can be used - approx. 100 words)**	***Measurement unit***	**Relevance (to the selected issue)**					**Feasibility (of obtaining and analyzing the information required)**					**Credibility (of the information)**					**Clarity (ease of understanding amongst users)**					**Comparability (over time and across regions)**					**Applicability (capability to be used by public authorities)**					
1				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5

																													Regional authorities	1	2	3	4	5
																													National authorities	1	2	3	4	5
2				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5
																													Regional authorities	1	2	3	4	5
																													National authorities	1	2	3	4	5
3				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5
																													Regional authorities	1	2	3	4	5
																													National authorities	1	2	3	4	5
4				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5
																													Regional authorities	1	2	3	4	5
																													National authorities	1	2	3	4	5

Indicator Category:			**Category description:**						
Infrastructure and institutions			**Adoption rate/progress:** **Indicators measuring the rate/progress of tourism SMEs in the adoption of measures for sustainable water uses.**						
#	***Indicator name***	***Indicator description***	***Measurement unit***	**Relevance (to the selected**	**Feasibility (of obtaining and**	**Credibility (of the information)**	**Clarity (ease of understanding**	**Comparability (over time and**	**Applicability (capability to be used by public authorities)**

		(Short description of the indicator and how it can be used - approx. 100 words)		issue)					analyzing the information required)										amongst users)					across regions)										
1				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5
																													Regional authorities	1	2	3	4	5
																													National authorities	1	2	3	4	5
2				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5
																													Regional authorities	1	2	3	4	5
																													National authorities	1	2	3	4	5
3				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5
																													Regional authorities	1	2	3	4	5
																													National authorities	1	2	3	4	5
4				1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	**Local authorities**	1	2	3	4	5
																													Regional authorities	1	2	3	4	5

																													National authorities	1	2	3	4	5

20 Annex 3: Data collection results

20.1 Table 18: Indicators provided by CASTWATER partners for SMEs' self-assessment

Indicators provided by CASTWATER partners for SMEs' self-assessment				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
Municipality of Rethymno (MoR)	Water availability	Water disparity (ratio of daily tourist water use and municipal water use per person/day)	The indicator will allow for a comparison between local resident and tourist water uses and will serve to indicate excesses in water use by tourists	100x (daily tourist water use / daily municipal water use per person)
	Water quality	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.	Degree of contamination per 100 ml
	Human uses and health	Ratio of tousim SMEs offering luxuryservices	This Indicator serves as a proxy for the amount of tourism SMEs providing services that require intense use of water resources. Luxury tourism services are more likely to include services that need great quantities of water, such as jacuzzis and swimming pools. This is a key qualitative characteristic of water sustainability in tourism because it can be a major constraint to the adoption of water sustainability measures.	100x (tourism SMEs offering luxuryservices/total number of tourism SMEs)
	Environmental health	Produced industrial wastewaters	Any waste water which is discharged from premises used for carrying on tourism, other than domestic waste water and runoff rain water.	Cubic meters (m3 /sec)
	Infrastructure and institutions	Ratio of tourism SMEs applying environmental management systems	This indicator focuses in revealing the amount of SMEs applying environmental management systems, such as ISO 14000 (International Organisation for standardisation) or EMAS (Eco-Management and Audit Scheme). The aim is to	100 x (tourism SMEs applying environmental management

Indicators provided by CASTWATER partners for SMEs' self-assessment				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
			find out how many SMEs in tourism have developed an integratied approach in tourism sustainability, including water sustainability	systems / total number of tourism SMEs)
		Ratio of commercial accomodations that have Installed rainwater harvesting systems	The indicator will reveal the relative amount of tourism SMEs using rainwater harvesting systems and will help develop an understanding of the use of alternative water sources to increase water sustainability	100x (commercial accomodations with rainwater harvesting systems / total number of commercial accomodations)
Emilia Romagna Region (RER)	Water availability	water consumption per guest per night	(number of m3 of water consumed during the high season tourism) *1000/(number of overnight guests during the same period) note: high season tourism in RER is from June to September	litres per tourist per day
		% of water consumption from public water utility	(yearly tourism SME public water utility consumption in m3) / (yearly tourism SME total water consumption in m3) * 100	%
		% of water consumption from groundwater abstraction	(yearly tourism SME groundwater consumption in m3)/ (yearly tourism SME total water comsumption in m3) * 100	%
		% of water consumption from greywater reuse	(yearly tourism SME consumption of grey water reuse in m3/(yearly tourism SME total water consumption in m3)*100	%
		% of water comsumption from	(yearly tourism SME consumption of rainwater harvesting in m3/(yearly tourism SME total water consumption in	%

Indicators provided by CASTWATER partners for SMEs' self-assessment				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
		rainwater harvesting	m3)*100	
	Water quality			
	Human uses and health	% of recycled water for irrigation	(yearly total consumption of water for irrigation from rainwater harvesting or grey water reuse in m3)/(yearly total consumption of water irrigation in m3)	%
		% of recycled water used for filling pools	(yearly total use of water for filling the pools from rainwater harvesting or grey water reuse in m3)/(yearly total use of water in m3 for filling the pools)	%
		% of recycled water used for flush toilets	(yearly total use of water for flush toilets from rainwater harvesting or grey water reuse in m3)/(yearly total use of water in m3 for flush toilets)	%
		% of recycled water used for laundry	(yearly total use of water for laundry from rainwater harvesting or grey water reuse in m3)/(yearly total use of water in m3 for laundry)	%
	Environmental health	% of eco compatible cleaning products	(yearly use of eco-compatible products for cleaning and for guest hygiene products in litres)/(yearly use of products for cleaning and for guest hygiene products in litres)	%
	Infrastructure and institutions	% of low flow tap fittings and showers	(number of low flow tap fittings and showers)/(total number of tap fitting and showers)*100	%
		% of low/dual flash toilets	(number of low/dual flash toilets)/(total number of toilets)*100	%
		% of checks for leaks during the SME opening period	(number of checks for leaks during the SME opening period)/(number of days of SME the opening period)*100	%

Indicators provided by CASTWATER partners for SMEs' self-assessment				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
Veneto Region	Water availability	Ratio of volume of drinking water consumed per year by the tourist structure on number of people hosted	It is a measure of the amount of water consumed per guest	N°
		Ratio of recycled water (eg. rain water) consumed by a tourist structure on the number of people hosted	It is a measure of the amount of recycled water consumed per guest	N°
	Water quality	Presence of water filtration systems for drinking water	It is a measure of the presence of water filtration system for drinking water	N°
	Human uses and health	Trend of tourist presences in environmentally certified structures	It is a measure of the popularity of environmentally certified structures	N°
	Environmental health	Tourist structure is connected to the local wastewater purification system?	It is a measure of the coverage of the local purification system	
		Ratio of volume of water recycled on total volume of water consumed	It is a measure of the amount of recycled water used	N°
		Tourist structure is holding an environmental certificate (e.g. EMAS, ECOLABEL, others)?	It is a measure of the popularity of environmental certificates	
	Infrastructure and	Total amount invested in	It is a measure of the investment in sustainable water use made by	N°

Indicators provided by CASTWATER partners for SMEs' self-assessment				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
	institutions	sustainable water use tools per structure	SME's	
		Existence of grants for energy efficiency (in relation to water recycling) for tourist structures	It is a measure of the support given to SMEs by PA through grants to improve energy efficiency (water saving or recycling)	
Water Board of Lemesos (WBL)	Water availability	Average Usage	Average water usage yearly	Liters
		Offer & Demand	Percentage of water used from the newtork over the total water approved or the total water allowed before changing pricing level.	%
	Water quality	Laundry	How many kg of laundry per day or per guest	kg
		Showers	Average Number of showers per visitor	L/min
		Kitchen	Water consumed in the kitchen and wasted in the ecosystem	m3
	Human uses and health	Competitive Consumption	Liters per guest night vs the average consumption in the touristic region the SME belongs into	ratio
	Environmental health	Decrease on water consumption	Percentage of a decrease on the water consumption per guest per night as a result of the adoption of measures	%
	Infrastructure and institutions	Pool	Amount of water used in the pool per season. This can be used to estimate the savings the SME has from the proper measures for pool maintenance.	Liters
		Gardens	Total amount of water reused for gardening over the total water used for gardenign. Efficiency of measures taken for	%

Indicators provided by CASTWATER partners for SMEs' self-assessment				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
			irrigation.	
		Recycle Water	Use of recycle water over the total water consumption	%
University of Patras (UPAT)	Water availability	Pressures in water availability due to seasonality of tourism	Number of visitors to site: mean number of tourists per month in high season compared to mean number of tourists per month during low season. The indicator will serve as a proxy to estimate the pressures on water availability caused by seasonality of tourism	100x (mean number of tourists per month in high season/mean number of tourists per month in low season)
		Water consumption per visitor day	Describes the amount of water consumed by each tourist per 24h. Allows for broad comparisons between different SMEs	m3 of water consumed per tourist, per 24h
	Water quality	Quality of water resources for drinking, bathing and recreation	Quality of water resources utilised by tourism SMEs for drinking, bathing and recreation (e.g. seawater suitability for swimming, river water quality for rafting)	Level of contamination per 100 ml (e.g. faecal coliforms, campylobacter)
	Human uses and health	Tourists' perception of water (e.g. seawater) quality	Indicator of how tourists view the quality of water in the area where the tourism SMEs are present. Tourists' perception of the quality of water (for bathing, drinking and/or recreational uses) in the environment may have a greater impact on tourist decisions than more scientifically obtained information. The % of tourists who agree that the	% of tourists who agree that the quality of water (for bathing, drinking and/or recreational uses)

Indicators provided by CASTWATER partners for SMEs' self-assessment				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
			quality is good or very good can be a signal to authorities that action is needed, or a positive factor to convey to tourists.	is good or very good
	Environmental health	Percentage of wastewater receiving treatment	Estimate of the relative amount of wastewater that does not pollute aquifers in touristic areas due to the adoption of wastewater treatment methods. This will be achieved by calculating the ratio of wastewater receiving treatment compared to tortal wastewater. The indicator provides a representative value for the relative amount of wastewater that receives treatment and, as a result, increases the sustainability of aquifers/water resources.	100x (m3 of wastewater receiving treatment/m3 of total wastewater)
		Percentage of commercial accommodation connected to central sewage system and/or employing tertiary sewage treatment	The indicator will reveal the relative amount of tourism SMEs using sewage treatment and will serve as a proxy for the decrease in the negative effects of tourism SMEs' development in the environmental health of ecosystems in tourism areas.	100x (tourism SMEs with sewage treatment/total number of tourism SMEs)
	Infrastructure and institutions	Amount of water recycled as a percentage of total water that could be potentially recycled, i.e. water used	The indicator calculates the level of adoption by SMEs of measures for reusing/recycling consumed water, so as to reduce the overexploitation of water resources.	100 x (m3 of recycled and reused water in a tourism SME/time measurement unit) / (m3 of total water

Indicators provided by CASTWATER partners for SMEs' self-assessment				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
				consumed by a tourim SME/time measurement unit)
		Degree of application of measures to monitor and maintain water systems in tourism SMEs	Tourism SMEs will inform the partners about which types of measures to monitor and maintain water systems, they have already implemented. Based on their input, the SMEs will get a score of 0-8 based on which of the following categories of measures they have already applied: • Water audit and benchmarking • Periodic monitoring • Sub-metering • Continuous monitoring • System inspection and maintenance • Avoid excessive pressure • Water conditioning • Adequate insulation The final indicator will provide an representative score of the progress of each SME with regards to the adoption of such measures and will allow for the identification of measures that have been less than necessarily implemented in the tourism sector.	Aggregate scale from 0 to 8
Euromediterranean Water Institute	Water availability	Knowledge about regulation of water and its usage	Assessment of the degree of knowledge of the regulations at different scales	1 to 5
		Knowledge about the	Assessment of the degree of knowledge of the	1 to 5

Indicators provided by CASTWATER partners for SMEs' self-assessment				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
Foundation (F-IEA)		existence of some incentives, subsidies and measures for saving	establishment in relation to possible subsidies and incentives	
		Positive assessment of measures and subsidies for saving water in your establishment	This indicator allows the establishment to value the suitability of setting measures and subsidies aimed at the reduction and optimization of water	1 to 5
		The implementation of a seal of quality of the responsible use of water	This indicator helps us to assess if the company appreciate the establishment of a seal of quality, or certification that endorses the use of efficiency measures and consuption reduction	1 to 5
		The communication of problems of water scarcity and measures taken by the company to customers	This indicator helps us to assess the existence of measures of the establishment towards the client in order to make user aware of the resposible use of water (wasteful practices, excessive use of towels, etc)	1 to 5
		The existence of water warning mechanisms for clients	This indicator allows to identify the use of mechanisms to monitor the use of water, with notice regarding a responsible or optimal volume	1 to 5
		The existence of training course for the staff	This indicator assesses whether employees are trained to save and consume water responsibly	1 to 5
	Water quality	The existence of measures aimed at saving water through aerators, sensors and	This indicator shows us if we have chosen to apopt measures intented to prevent water waste	1 to 5

Indicators provided by CASTWATER partners for SMEs' self-assessment				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
		timers		
		The existence of appliances efficient with water consuption	General assessment of the use of efficient appliances in consumption, such as washing machines, dishwashers, etc.	1 to 5
		The existence of mechanisms for the total or partial discharge of water in tanks	This indicator allows us to measure the degree of effciiency in resposible consumption through new technologies	1 to 5
		The existence of faucets that allow obtaining a desired temperature	This indicators assess our contribution to water saving	1 to 5
	Human uses and health	The existence of measures aimed at water reuse	General assessment of the use of reuse measures, including those proposed in the following indicators	1 to 5
		The existence of Installation and use of reuse systems for irrigation	This indicator helps us to assess the possibility to reuse water once used and save it	1 to 5
		The existence of installation of rainwater harvesting systems	This indicators allows us to consider the installation of a system that collects rainwater	1 to 5
		The existence of own water purification system	Assessment of own infrastructures and treatments to purify the water used for other purposes such as pool water; optimization of grey water use	1 to 5
	Environmental	The existence of a	This indicator tells us if there is a prevention in the use of	1 to 5

Indicators provided by CASTWATER partners for SMEs' self-assessment				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
	health	periodic inspection program for the maintenance of the facility's hydraulic infrastructures	water, breakdowns and losses that can lead to water losses	
		The existence of specific personnel for its maintenance	This indicator assesses if the establishment has maintenance personnel whose functions include inspecting and maintaining infrastructures	1 to 5
		The existence of individualized counters for each room/area of the establishemnt	Through the use of individual meter, leaks maight be better located and checked, and at the same time it can be used as a tool to reward customers and workers for good usage of water	1 to 5
		The existence of a periodic maintenance of the appliances	This indicator helps us to assess the review and mantainance of devices that use water such as dishwashers, washing trains etc.	1 to 5
	Infrastructure and institutions	The existence of some incentive towards the client for lower consumption	This indicators shows if there is any type of measure that rewards customers for lower water consumption and foster this action	1 to 5
		The existence of advantages that aims the client not to change towels daily	This indicator tells us whether customers are informed about rational use of water	1 to 5
		The existence of information for customers rational use	This indicator explains us if the establishement contribute to make customers aware about water saving	1 to 5

Indicators provided by CASTWATER partners for SMEs' self-assessment				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
		of water (brochures, stickers)		
		The existence of survey for customers	This indicator can give us an idea of the knowledge of the customers about the problem of water scarcity	1 to 5
Institute of Agriculture and Tourism (IPTPO)	Water availability	% of water from public water supplier	(water delivered from public water supplier in m3 / Total water consumption in m3) * 100 Total consumption water = water consumption from public water supplier + water consumption from alternative sources (annual level)	%
		% of alternative water sources	(alternative sources' water consumption in m3/ Total water consumption in m3) * 100	%
		% of water consumption in high season	(water delivered from public water supplier in m3 in high season (June – September)/ Total delivered water from public water supplier in m3 - annual level) *100	%
	Water quality	% of drinkable water	(Drinkable water consumption in m3/ Total water consumption in m3) * 100 Drinkable water = water delivered from public water supplier + alternative sources containing drinkable water (in accordance to legal regulations) (annual level)	%
	Human uses and health	% of water used for irrigation	(Water in m3 used for irrigation / Total water consumption in m3) * 100 (annual and or monthly level)	%
		% of water used for swimming pools	Water in m3 used for swimming pools / Total water consumption in m3) * 100 (annual and or monthly level)	%
		Average pool water	Water in m3 used for swimming pools /(number of	m3

Indicators provided by CASTWATER partners for SMEs' self-assessment				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
		spending per average nights of stay	guests/number of nights) (annual and or monthly level)	
		Average water spending used for irrigation per operational day	Water in m3 used for irrigation /number of operational days (annual and or monthly level)	m3
		Average pool water spending per operational day	Water in m3 used for swimming pools / number of operational days (annual and or monthly level)	m3
	Environmental health	Average amount of water used for irrigation	Water in m3 used for irrigation / Irrigated surface in m2 (annual and or monthly level)	m3
	Infrastructure and institutions	% of low flow tap fittings	(Number of low flow tap fittings / Total number of tap fittings) * 100	%
		% of dual flush toilets	(Number of dual flush toilets / Total number of toilets) * 100	%
		Average number of flow tap fittings per capacity	Number of low flow tap fittings / capacity (number of rooms)	number
		Average number of dual flush toilets per capacity	Number of dual flush toilets / capacity (number of rooms)	number
Departmental Council of Herault (CD34)	Water availability	Environmental Good practices suggested to customers	This is a **qualitative indicator*** which asees the level of awarness campaign like a "Good practices guide" distribution or other media to aware customers	1 to 5
		Environmental Good practices enforced to establishment personnal	This is a **qualitative indicator** which asees the level of specific prescriptions on good water use for all the people working in the establishment. It could be a guide joint to the employment agreement	

Indicators provided by CASTWATER partners for SMEs' self-assessment				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
		Level and relevance of awareness messages	This is a **qualitative indicator**. the awareness message could be a general information or a specific information dedicated to the local context : preciousness of the local resource, specific treats. The purpose is raising the awareness and motivating the public, with a simple and adapted vocabulary, evidencing the positive results of saving water.	1 to 5
		Environmental label of the establishment	This indicator assesses the achievment of an ecological action plan. Unfortunately, most of the label don't target specificly the water saving efforts : nomber of label obtained	1 to 5
	Water quality	Level of Water leaks	This indicator give the level of water losses in the internal network : % of leaks in the establishment = 100 - (Volume distributed / Volume withdrawn)	1 to 5
		Level of performance of water saving devices	Devices for limiting consumption at the taps (aerators, time-taped…) : number of points with hydroeconomical equipment / total number of taps	1 to 5
		Development of dry green spaces with mediterranean vegetation	This qualitative indicator gives an indication on the efforts to adapt the vegetation ((hedges, trees, shrubs and turf) on the context of scarcity and dry climate : linar of adapted vegetation / total linear	
		Limitation of vegetal evapotranspiration by mulching	This indicator gives an indication of the mulching practice which could limit the water consumption of green spaces : : linear of green ground surface mulched / linear of green spaces	
		Water consumption of green spaces	This indicator gives an indication of the water uses for green spaces : m3 consumed /m2 green ground surface	
		Level of knowledge of	A good networks knowledge is important to have a good	

Indicators provided by CASTWATER partners for SMEs' self-assessment				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
		water networks	managment of consumptions ans leaks detection. This **qualitative indicator** assess the level of knowledge of the drinking water network and wastewater network (existence of paper plans, digitized plans ...)	
		Water consumption level	This indicator assess the level of water consuption of the establishment which can be compared to another one thanks to reported per overnight : Volume of water consumed per tourist / overnight.	
		Water consumption for pool use	This indicator gives an indication on the proportion of water for pools needs compared to the global needs : volume of water consumed by the pool / number of opening days / customer	
	Human uses and health	Existence of Wastewater recycling system (for irrigation or for WC)	Proportion of recycled water : volume of reused water / total volume	1 to 5
		Existence of recycling pool water system	Proportion of recycled water : volume of recycled water from swimming pool/ total volume consumed	1 to 5
		Recovery and reuse of rainwater	Proportion of recycled water : volume of water recovered on the roof and reused / Total volumes of water consumed	1 to 5
		Secondary ressource	Level of volumes substituted by a secondary source of water for use which doesn't need non drinkable water : secondary ressource volume / total volume consumed	1 to 5
	Environmental	Presence of divisional meters	This an **qualitative indicator** which gives the proportion of volumes consumed by domestic uses, pool uses, green spaces uses etc	1 to 5

Indicators provided by CASTWATER partners for SMEs' self-assessment				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
	health	Performance of water meter monitoring systems	This is an **qualitative indicator** which informs on the level and reliability of monitoring : manual reading (different frequencies, radio-relay, other data transmission system, alarm system in case of anomaly) and the age of the water meters : level from 1 to 5	1 to 5
		Leakage search campaign (winter)	This indicator reveals the degree of supervision to water losses : number of searches / year	1 to 5
		Monitoring of drilling water	This indicator is specific to establishment supplied in drilling water : volumes actually taken / volumes authorized (m3/h or m3 /year).	1 to 5
		Monitoring of Irrigation system	Water saving devices to optimise irrigation volumes : evaporation measure system and irrigation control by software : % green spaces monitored	
	Infrastructure and institutions	Treatment of green spaces with phytosanitary products	This indicator is important to follow the efforts to reduce or even to avoid the us of phytosanitary products	1 to 5
Malta Regional Development and Dialogue Foundation (MRDDF)	Water availability		Municipal potable water consumption (metered - m3)	
			Self-supply water consumption (Alternate water sources by self supply ex rainwater harvesting, bottled, borehole, re-use via RO)	
			Yearly occupancy or tourist arrivals or bednights by month or quarter	

Indicators provided by CASTWATER partners for SMEs' self-assessment				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
			Water use by residential population	
			Water price per m3	
	Water quality		Yearly occupancy or tourist arrivals or bednights by month or quarter	
			Frequency of reports on water-borne diseases or water incidents	
			Taste perception	
			Water sources used, and internal control procedures	
	Human uses and health		Percentage of water from the destination/site receiving treatment	
			Frequency of water-borne diseases or complaints from visitors reporting health water-borne illnesses during their stay	
	Environmental health		Tourism ECO certification enrolment	
			Sustainability and environmental management system in place applying water-saving policies, techniques, devices	

Indicators provided by CASTWATER partners for SMEs' self-assessment				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
			% of waste water receiving treatment	
			Percentage of tourism establishments (or accommodation) on (suitable) systems treatment	
	Infrastructure and institutions		Participation in recognised environmental schemes	
			No. of water saving devices	
			Existence of water conservation promotion with tourists like option to re-use their towels and bed linen	
			No of trained staff on water conservation	
Energy and Water Agency (SEWCU)	Water availability	Room water consumption per bed-night	The amount of water consumed in each bed room per person per bed night in a specific tourism establishment. The indicator focuses just on the water used in the tourism room, which is exclusive of all indirect water use such as for cooking, cleaning , landscaping, recreation etc	litres/day
		Water consumption in supporting facilities per-visitor basis	Water consumption in supporting facilities (kitchen, swimming pools, cleaning, …….) calculated on a per-visitor basis in litres/day	litres/day
	Water quality	% of water outflow points supplying water fit for human	Number of accssible water outflow points (kitchen and bathroom faucets, showers, baths,…..) in the tourism establishment that supply water that is fit for the human	

Indicators provided by CASTWATER partners for SMEs' self-assessment				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
		consumption	consumption compared ot the total number of water outflow points in the establishment.	
	Human uses and health	% of tourists complaining on health-related water issues	number of tourists complaining on health-related water issues (taste, turbidity etc) compared to the total amount of tourists visiting the establishment.	%
	Environmental health	% of wastewater discharges from hotel diverted to an advanced wastewater collection systems	volume of wastewater discharged from the hotel that it is diverted to an advanced wastewater collection and treatment system compared to the total waste water amount the establishment is generating	%
		% of visitors taking up active water efficiency measures	% of visitors taking up active water efficiency measures in the hotel room or within the whole complex (Hotel, Motel, Inn, etc). E.g.. reuse the towels, chooses to stay in an efficient room etc. compared to the total visitors to the etablishment	%
	Infrastructure and institutions	% of water outflow points fitted with water saving devices	The number of water outflow ponts (faucets, showers, flushings etc) fitted with water saving devices compared to the whole number of outflows poitns within the establishment	%
		% of water supply generated from non-conventional water resources	A comparison of the water supply volume generated from non-conventional water resources (such as rainwater harvesting, desalination and water reuse) within the complex to the whole water demand by the same complex.	%

20.2 Table 19: Indicators provided by CASTWATER partners for monitoring by PAs

Indicators provided by CASTWATER partners for monitoring by Public Authorities				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
Municipality of Rethymno (MoR)	Water availability	Total Tourism water use	The indicator will help estimate the impact of tourism on existing water resources during the high season, and to check for any excesses in water demand by tourism businesses	Total million m3 of water consumed in tourism industry
	Water quality	Percentage of tourism wastewater receiving treatment	This indicator will provide an estimate for the amount of wastewater that returns to and pollutes the aquifer. The greater the indicator the smaller the pollution of water resources that return to the environment	100x(L of treated wastewater/total L of wastewater)
	Human uses and health	Effectiveness of water management policies	This indicator will measure the effectiveness of policies and instruments related to water management in the tourism sector. A rank from 0 to 8 attributed to each public authority about how effectively it forms and manages policies for the sustainability of water in tourism, as viewed by tourism businesses. More precisely, tourism businesses will give 1 point to relevant public authorities for each of the following factors: 1. Clear assignment of roles and responsibilities for water policy and implementation 2. Local authorities' participation in the water management system 3. Coherent management of water-tourism policies 4. Available funding (i.e. budget) for water policies	Rank from 0 to 8 attributed to each public authority about how effectively it forms and manages policies for the sustainability of water in tourism, as viewed by tourism businesses.

Indicators provided by CASTWATER partners for monitoring by Public Authorities				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
			5. Policies for promoting integrity and transparency in water management 6. Public consultation and participation of stakeholders in water policies 7. Development of conflict resolution mechanisms 8. Educational programmes and communication activities to raise public awareness	
	Environmental health	Analysis of the impact of tourism activities on water resources	The indicator will provide an estimate of the total amount water consumed by each tourism business analysed in the following categories: a) laudry, b) ensuite facilities c) food services, d) leasure activities. By aggregating the amount of water spent in each type of activity, PAs will manage to develop an understanding of the environmental impact of each category and propose solutions	Scorecard (matrix) filled with the m3 of water spent by each tourism business in each category
	Infrastructure and institutions	Ratio of tourism businesses providing ecotourism and in general sustainable tourism services	This indicator focuses in revealing the diffusion of ecotourism and, in general sustainable tourism models in Mediterranean tourism destinations. Since ecotourism and relevant tourism paradigms are more friendly to water resources, the indicator will estimate the progress of water sustainability in tourism in the sense of reducing the impact of mass tourism on water resources	100 x (tourism business providing sustainable tourism services / total number of tourism businesses)
Emilia Romagna	Water availability	Water consumption per resident per day	Average number of litres of water per day used by a resident	litres / day
		Water consumption per	Average number of litres of water per day used by a tourist	litres /day

Indicators provided by CASTWATER partners for monitoring by Public Authorities				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
Region (RER)		tourist per day in tourism SMEs	in tourism SMEs during the high tourism season	
		Days of shortage water supply	Number of days in a year during which the water supplier can't satisfy all water requests.	days /year
	Water quality	Waste water per resident	Flow rate (input flow - output flow) of wastewater treatment plants	m3/s
		Waste water per tourist	Flow rate (input flow - output flow) of wastewater treatment plants, during the high tourism season	m3/s
		Days when sea bathing is forbidden	Number of days in a year when bathing is forbidden according to the EU Directive 2006/7/EC	number of days
	Human uses and health			
	Environmental health			
	Infrastructure and institutions	Public authority actions to reduce public water consumption	Number of actions of the public authority to reduce public water consumption in relation to residents and tourists (for example irrigation of public green, roads cleaning, public fountains, awareness campaigns)	number of actions/ (number of resident + yearly average number of tourists)*100
		Financial resources for tourism SMEs to implement sustainable	Amount of financial resources set aside for the tourism SMEs to finance the implementation of sustainable water measures	€/(total number of tourism SMEs)

Indicators provided by CASTWATER partners for monitoring by Public Authorities				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
		water use measures		
		Financial resources to implement tourists awareness campaigns on water	Amount of financial resources set aside to finance awareness campaigns aimed at tourists for sustainable water use	€/(yearly average number of tourists)
Veneto Region	Water availability	Ratio of volume of drinking water consumed on total volume of drinking water pumped into water main	It is a measure of the amount of water consumed compared to the total amount of water available	m^3
		Ratio of volume of drinking water consumed to estimation of tourist presence in the period	It is a measure of the drinking water consumed compared with tourist presences	m^3
	Water quality	Average number of chemical controls on drinking water quality per year	It gives a measure of the water quality care	N°
		Percentage of tourist structures that have installed some equipment for internal water recycling (swimming pool, showers).	It is a measure of the awareness on the importance of sustainable water use	%
	Human uses and	Estime of volume of water saved using water saving	It is a measure of the importance given to the use of water saving tools	m^3

Indicators provided by CASTWATER partners for monitoring by Public Authorities				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
	health	tools		
		Number of campaigns made aimed to raise awareness on sustainable water use. (How many, means of dissemination)	It is a measure of the importance given to sustainable water use	N°
	Environmental health	Percentage of tourist accommodation and restaurant services using the local wastewater purification system	It is a measure of the coverage of the local purification system.	%
		Trend of tourist presence per year	It is an index of the popularity of a tourist place. It may depend also on the ecosystem conditions.	N°
		Ratio of structures with environmental certification (e.g.EMAS, ECOLABEL, others) on total tourist structures	It is a measure of the importance given to environmental health by tourist structures.	N°
		Number of “areas suitable for bathing” on the basis of periodic checks on the quality of marine waters	It is a measure of the tourist attraction power of the place. Data are available on Arpav (Agenzia regionale per la prevenzione e protezione ambientale del Veneto) website	N°
	Infrastructure and institutions	Total value of contributions granted for energy efficiency (in relation to water	It is a measure of the grants that could be available at local, regional or national level to improve energy efficiency through water saving or recycling.	N°

Indicators provided by CASTWATER partners for monitoring by Public Authorities				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
		recycling) by PA to tourist structures		
Water Board of Lemesos (WBL)	Water availability	Demand over offer	Water demand by the tourism industry in the regional level over the total available resource in the region	%
		Water Utilization	Water consumption over water collection in the region	%
		Comparative Usage	Comparative usage per capita with the average usage per among other touristic areas in the Med (ratio)	Ratio
	Water quality	Swage Usage	Total water added in the swage system in a touristic region	m3
	Human uses and health	Water Reusability	Percentage of the water used from the netowrk over the total amount of water used by the touristic region	%
	Environmental health	Water Depletion	Water consumption minus water collected over total water in the beginning of the period. If the substraction is above 0 (i.e. more water consumed than collected) then the indicator shows the water depleted from the beginning of the period. Otherwise the indicator is 0.	%
	Infrastructure and institutions	Reduction of Water Usage	Compare the water usage of a particular region with previous periods (before the measures took effect.)	%
University of Patras (UPAT)	Water availability	Water consumption per tourist (24h) compared to general population water consumption per resident night	The indicator will help estimate the impact of tourism on existing water resources compared to the impact of domestic consumption	L of water consumed by tourist per 24h / L of water consumed by

Indicators provided by CASTWATER partners for monitoring by Public Authorities				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
				resident per 24h
	Water quality	Inverse ratio of tourism businesses' infrastructures connected to wastewater treatment facilities	This indicator will serve as a proxy for estimating the degree of pollution of water resources caused by tourism businesses, as well as a calculation of the diffusion of the use of wastewater treatment facilities & technologies in the tourism sector	100x(infrastructures connected to wastewater treatment / total number of infrastructures)
	Human uses and health	Ratio of water supplied from sources other than public utility	This indicator will measure tourism SMEs' capability to increase the availability of water (thus meeting increasing water demand) via multiple sources.	100x(m3 of water supplied from alternative sources/total amount of water supply)
	Environmental health	Greywater footprint in tourism	The grey water footprint in the tourism sector refers to the volume of water that is required to assimilate waste generated by tourism services, quantified as the volume of water needed to dilute pollutants to such an extent that the quality of the ambient water remains above agreed water quality standards	The grey water footprint is calculated by dividing the pollutant load (L, in mass/time) by the difference between the ambient water quality standard for that pollutant (the maximum

Indicators provided by CASTWATER partners for monitoring by Public Authorities				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
				acceptable concentration cmax, in mass/volume) and its natural concentration in the receiving water body (cnat, in mass/volume).
	Infrastructure and institutions	Ratio of tourism SMEs receiving funding for integrating water efficient technologies	This indicator reveals the amount of tourism businesses supported by the public authorities to achieve water efficiency. It will also serve as an estimation of the extension of the use of public sector supporting instruments with regards to achieving water efficiency in tourism.	100 x (tourism business receiving funding / total number of tourism businesses)
Euromediterranean Water Institute Foundation (F-IEA)	Water availability	Water scarcity	Ratio of total water footprint to total renewable water resources	(%)
		Consumption	Tourist water consumption per capita	(liters/day)
		Water system leakages	Percentage of water lost in the distribution system	(%)
		Mechanisms for the exchange of knowledge-experiences between administrations	The existence and subjective assessment of the mechanisms through which the body can access or exchange information with other administrations with related competences	1 to 5
	Water quality	Drinking water quality	Percentage of drinking water meeting the EU Drinking Water Directive	(%)

Indicators provided by CASTWATER partners for monitoring by Public Authorities				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
		Regulatory framework for decision making affecting water-tourism	Values if there exist and function any institutions responsible for securing the functions of the water services provided to the tourism industry (quantity, quality, safety)	1 to 5
		Sewage sludge quality	Percentage of sewage sludge that can be safely reused	(%)
	Human uses and health	Safe Sanitation	Percentage of city population served by wastewater collection and treatment	(%)
		Sufficient to drink	Percentage of city population, with potable water supply service	(%)
		Degree of transparency in hiring policies	indicator to evaluate the degree of transparency in the system through which the agency contracts services related to the proper use of water, including a transparent scale, access through public participation, etc	1 to 5
		Degree of transparency in information	This indicator helps us to assess if the information about transparency policies managed by agencies is accessible for the interesed actors	1 to 5
		Updated information systems and access to them; exchange between administrations	Percentage of city population, with potable water supply service	(%)
	Environmental health	Specific Regulatory legislation	Apart from the generic legislation, it is sought to evaluate is there is specific regulation; the valuation might be done if it does not exist and if it does, we might asses its degree of implementation.	(%)
		Need for specific	Assessment of the need for such legislation regardless of its	1 to 5

Indicators provided by CASTWATER partners for monitoring by Public Authorities				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
		regulatory legislation	existence	
		The existence of specific department with competences in this matter and	indicator referring to the existence of a service or body with specific competences	1 to 5
		Integrated management policies and strategies and its degree of implementation	Policies and strategies which main objective is to achieve the goals of water use and if these exist, it seeks to evalute its practical implementation	1 to 5
	Infrastructure and institutions	Public Participation	Proportion of individuals who volunteer for a group or organization as a measure of local community strength, such as groups of volunteers who could take care of the ecosystem integrity	(%)
		Maintenance	Percentage of infrastructure for wastewater collection, distribution and treatment younger than 40 years especially for tourism intensive areas	(%)
		Water-efficient devices	Percentage of public buildings aimed at tourism activities equipped with water-efficient devices (water-pools, museums ets)	(%)
		Water recycling technologies	Percentage of public buildings that use water recycling technologies	(%)
Institute of Agriculture and	Water availability	% of used water	(Total delivered water from public water suppliers / Total available water from all sources) * 100 (annual level)	%
		Influence of tourism on water delivery	(Number of days during the main season when a reduction of water consumption was carried out / number of days of	%

Indicators provided by CASTWATER partners for monitoring by Public Authorities				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
Tourism (IPTPO)			the main tourist season) *100	
	Water quality	Water safety from public water suppliers	(Number of unsafe water samples from public water suppliers / number of total water samples from public water suppliers) * 100 (annual level)	%
	Human uses and health			
	Environmental health	Influence of tourists on increase of the wastewater amount	(wastewater amount from public sewerage in m3 / number of tourists) *100 (annual level)	%
	Infrastructure and institutions	Level of destination's water network supply development	(Population connected to the public water supply / total population) * 100	%
		Level of destination's water network supply quality	(Water losses / Total delivered water) * 100 (annual level)	%
Departmental Council of Herault (CD34)	Water availability	Water losses in water system	Efficiency rates of water distribution network of local authorities : range of values (maximum – maximum and average)	
		Tourist consumption	This indicator offers a comparison between the customer consumption and permanent inhabitant consumption : Volume of water consumed per tourist per night / Volume of water consumed per inhabitant per day	
	Water quality	Wastewater treatment diseases	Percentage of sewage treatment plants where non-compliance of releases (inhabitant equivalent)	

Indicators provided by CASTWATER partners for monitoring by Public Authorities				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
		Water quality problem in bathing area	Percentage of bathing points where temporary prohibiting bathing	
	Human uses and health	Regulation instruments of visitor's capacity	This is a indicator which reports existence and scope of planning tools that regulate the tourism infrastructure (achievements or extensions)	
	Environmental health	Monitoring and securisation of low flow rivers	The amount of water consumed is higher during low-water periods (touristic consuption, lawn watering, car washing, swimming pools, etc. in summer). This bad balance between uses can have consequences for aquatic environments and also for recreational uses dependent to these environments. This indicator informs the performance of Monitoring system and capacity to regulate the disease (water dam managment for exemple).	
	Infrastructure and institutions	Contribution of tourist users to the water price	This indicator informs if the local authority is adapting water price and to what degree the price of water or other taxes is an equitable tourist contribution (in proportion to its level of consumption)	
Malta Regional Development and Dialogue Foundation (MRDDF)	Water availability		Cost per cubic meter of accounted for water	
			Municipal potable water consumption (metered - m3)	
			Self-supply water consumption (Alternate water sources by self supply ex rainwater harvesting, bottled, borehole, re-use via RO)	
			Yearly occupancy or tourist arrivals or bednights by month or quarter	

Indicators provided by CASTWATER partners for monitoring by Public Authorities				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
			The number of service disruption days per person.	
	Water quality		Yearly occupancy or tourist arrivals or bednights by month or quarter	
			Frequency of reports on water-borne diseases or water incidents	
			Yearly occupancy or tourist arrivals or bednights by month or quarter	
	Human uses and health		Percentage of water from the destination/site receiving treatment	
			Frequency of water-borne diseases or complaints from visitors reporting health water-borne illnesses during their stay	
			Level of training that water and waste water operators have received.	
			Tourism seasonal and national trends for the relevant basin.	
	Environmental health		No. of surface water quality samples complying with water quality objectives	
			Bathing water quality indicators in locality	
			Sectorial promotion, awareness, enforcement of rules and regulations	
			Number of permits for wastewater discharge licensed according to the regulations	
	Infrastructure and		Tourism ECO certification enrolment	
			Finance or grants available for water conservation	

Indicators provided by CASTWATER partners for monitoring by Public Authorities				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
	institutions		investments	
			Vulnerability of the supply caused by seasonal variations and/or depleting ground water resources.	
			Formal stakeholder structures established with clear roles and responsibilities in water resources and tourism management.	
Energy and Water Agency (SEWCU)	Water availability	% Tourism water demand compared to the National (Regional) Water Demand	This is a measure of the amount of water that is supplied for direct tourism purposes compared to the national water demand. Thus the value is calculated: Water consumption for tourism / National water demand	%
		Comprehensive Water Demand of the Tourism Sector expressed per tourist-day	Water demand of the tourism sector divided by the total number of bed-nights spent by tourists in the region/country	litres per capita per day
	Water quality	% of tourism establishments having access to a water supply achieving the quality requirements of the EU Drinking Water Directive	The amount of touristic establishment has to be established and from these one has to identify which have a water supply in accrodance with the EU Drinking Water Directive. Thus the equation consists as follows: No of tourist establishments in accordance to the EU drinking water directive / no of all the touristic establishment in the region/coutnry	%
	Human uses and health	% of Tourism Establishments having access to a wastewater collection and/or	the number of tourism establishments that have a waste water collection installed at their premises or ones that treat their waste water / all tourist establishments	%

Indicators provided by CASTWATER partners for monitoring by Public Authorities				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
		treatment systems		
		% of Tourism Establishments warned by Health Authorities in relation to issues pertaining to water quality.	the number of tourism establishments that have been issued a health warning regards water quality compared to the total number of tourism establishments.	%
	Environmental health	% of Coastal and Transitional Water bodies in Good Qualitative Status according to the Water Framework Directive	This indicator compares the number of coastal and transitional bodies that are in good status according to the Water Framework Directive ato the total number of coastal and transitional water bodies in the region/country	%
		% of Bathing Waters in Good Status according to the Bathing Water Directive	Number of bathing waters that are in good status according to the directive compared to all the bathing waters of the region/country	%
	Infrastructure and institutions	Ratio of %GDP contribution by the tourism sector to % water consumption of the tourism sector	Indicator assess the added value generated by the tourism sector for every 1m3 consumed	%
		% of Tourism Water Supply coming form	This is a measure of the amount in % of the supply of water from RWH (rain water harvesting systems), desalination or	%

Indicators provided by CASTWATER partners for monitoring by Public Authorities				
Partner	**Thematic selection criterion**	**Indicator name**	**Indicator description**	**Mesurement unit**
		Non-Conventional Water Resources	water reuse in the tourism sector.	

21 Annex 4: the complete CASTWATER indicator system

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 amount of tourism SMEs using smart irrigation technologies, 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

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 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
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

Code	Indicator	Indicator description	Measurement unit
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
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.
PA1	Effectiveness of water management policies	This indicator will measure the effectiveness of policies and instruments related to water management in the	Average rank depending on the SMEs' opinion about how well have been implemented

Code	Indicator	Indicator description	Measurement unit
		tourism sector	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.
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

Code	Indicator	Indicator description	Measurement unit
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.
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