Project co-financed by the European Regional Development Fund

CO-EVOLVE

Promoting the co-evolution of human activities and natural systems for the development of sustainable coastal and maritime tourism

Deliverable 3.17.1 – Adapting tourism sustainability evaluation methods to local needs

WP3

University of Thessaly

Programme cofinanced by the European Regional Development Fund

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1. Introduction

The report focuses on the methodological process of using the conceptual model and Tourism Sustainability Toolkit developed under *Deliverable 3.16 Tourism Sustainability* as a basis for developing pilot area specific sustainability assessment framework at a local scale. The key objective is to explain how to implement and test the model in the seven pilot areas of the project using simple adaptation strategies. The sustainability evaluation will be carried out in connection with *Activity 3.18 Tourism-driven strategic planning on Pilot Areas* in order to feed and support future planning activities and strategies towards sustainable tourism development.

The report follows the step by step approach developed in the Co-Evolve context in order to adapt the sustainability evaluation model to each destination and attempts to answer key methodological issues that may emerge during the implementation process. Moreover, it outlines the structure and content of *Deliverable 3.17.2 Evaluation of tourism sustainability in the Pilot Areas* where the main outcomes of the methodological procedure described herein will be presented.

The outcomes of Deliverables 3.17.1 and 3.17.2 in combination with Deliverable 3.18 will feed **Work Package 4: Testing** with inputs for future planning activities and recommendations in the pilot areas.

2. Adapting sustainability of tourism destinations to local needs

The system of indicators (Tourism Sustainability Toolkit) developed in Co-evolve (Task 3.16) aims to assess tourism development in relation to the four dimensions of sustainability (environment, society, economy and governance) as well as to the different types of tourism activity and main threats and enabling factors encountered in Mediterranean coastal destinations.

The main goal of Task 3.17 is to support testing this multilevel system in seven highly diversified pilot areas selected in the context of Co-evolve in order to demonstrate the necessity and usefulness of a common framework of reference and yet flexible enough in measuring and evaluating tourism sustainability in coastal destinations.

Therefore, building further on the outcomes of Activity 3.16, the present chapter introduces two main objectives:

- To demonstrate the process of adapting/customizing sustainability indicators to local needs through a common methodological framework
- To highlight the usefulness of the customized toolkits in measuring, evaluating and monitoring tourism sustainability for current and future development in the selected destinations.

In this context and in the process of implementing and testing the system of indicators at different pilot destinations, the current approach attempts to answer three key methodological issues:

- How to adapt indicators and provide customized toolkits for each destination based on a common methodological framework
- How to manage different types of data
- How to deal with data gaps

2.1 Methodological framework for measuring tourism sustainability at coastal destinations: Application in Pilot areas

The framework developed in Co-Evolve is a three-tier system composed by the following sets of indicators:

- **Core indicators**: 40 indicators have been selected from the European Tourism Indicator System (ETIS) to serve as the basis for comparison of the level and trends of sustainable development for all types of destinations
- **Destination indicators**: an extensive set of indicators developed to address the specific issues of coastal areas according to the characteristics and particularities of the predominant type of tourism activity in each type of destination (Beach/Maritime tourism, Urban/Cultural tourism, Cruising, Recreational boating, Nature/Ecotourism).
- **Pilot area-specific indicators**: a third set of indicators developed on the basis of area-specific critical issues with specific linkages to the main threats, enabling factors and governance issues identified in Mediterranean coastal areas.

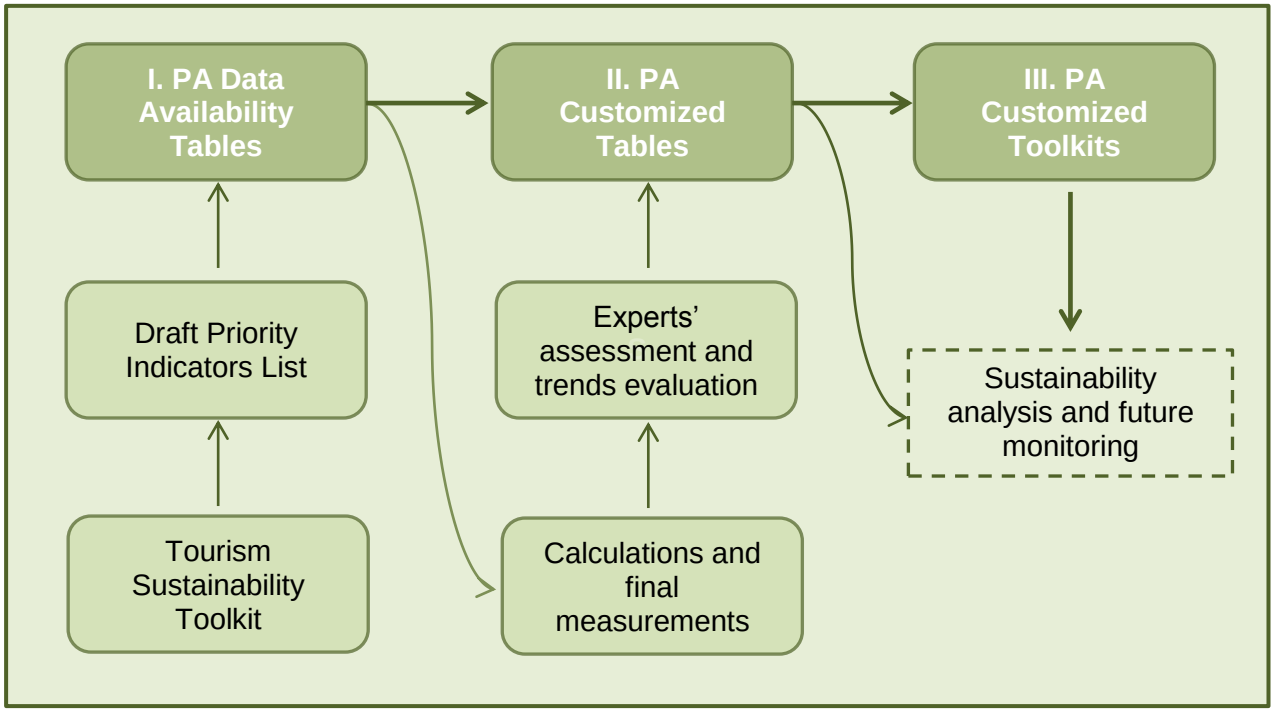
This three-tier system represents an extended and flexible Tourism Sustainability Toolkit that can be customized according to the specific needs and characteristics of the highly diversified Mediterranean coastal destinations.

The starting point of Co-evolve is a list of Priority indicators (P.I.) selected from the Toolkit which represent the most common critical issues and specificities encountered in Mediterranean coastal tourism destinations. The list is meant to act as a ***starting basis*** to be used for comparisons among coastal tourism destinations in the Mediterranean basin.

The process of adapting the indicators and customizing the sustainability evaluation toolkit for each Pilot Area (PA) is divided in three stages (see Figure 1):

I. Identification of Pilot Area Data Availability
II. Customization of Pilot Area Indicators
III. Development of Pilot Area Customized Toolkits

Figure 1: Process for measuring tourism sustainability at destination level – Pilot Areas (PA) Applications



Source: UTH elaboration

I. Identification of Pilot Area Data Availability

Following the three-tier classification of indicators developed in the context of Co-evolve (Core, Destination and Pilot Area Specific indicators), the first stage is meant to ***limit the range of possible indicators and highlight the most important ones that should be measured and monitored*** in each pilot area according to the specific needs and characteristics of each destination. At this stage, Pilot Area Coordinators are invited to specify the importance/relevance of each Priority Indicator to their pilot area and further enrich the list with more indicators if necessary (see full Table in Annex – Figure 1).

Moreover, the first stage includes an overview of available data sources in order to ***identify the type of available data and highlight important data gaps***. More analytically and starting from the basic set of Core Indicators described above, the following information are required from Pilot Area Coordinators in order to complete the Data Availability Tables (see Figure 2):

1. *Relevance to PA*

   Relevance and priority of each indicator (low or high) in relation to the Pilot Areas' specific characteristics, development patterns and pressures.

2. *Measurement with Quantitative data*

   Availability of quantitative data to calculate an indicator (Measurable/Not Measurable).

In order to overcome potential gaps in quantitative data, the use of Proxy and Qualitative data has been considered as an alternative solution.

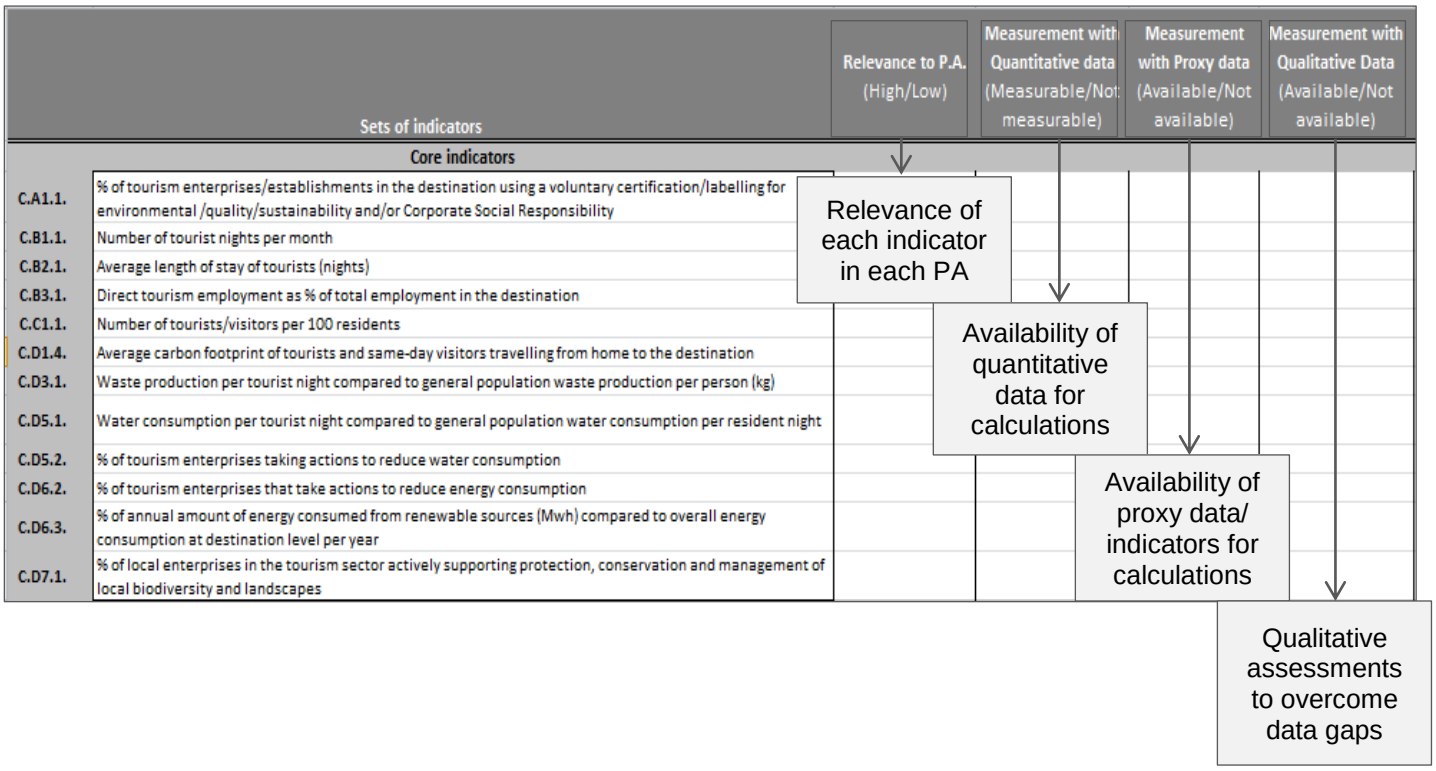
3. *Estimation with Proxy data*

   In case no quantitative data is available, identification of any other available proxy calculations or indicators could be essential in order to provide hints for the specific issue.

4. *Estimation with Qualitative data*

   In case both quantitative data and proxy methods of measurement to calculate an indicator are missing, the use of qualitative data may be considered to replace quantitative analysis with information coming through expert knowledge.

Figure 2: Prioritization of the indicators and data availability review

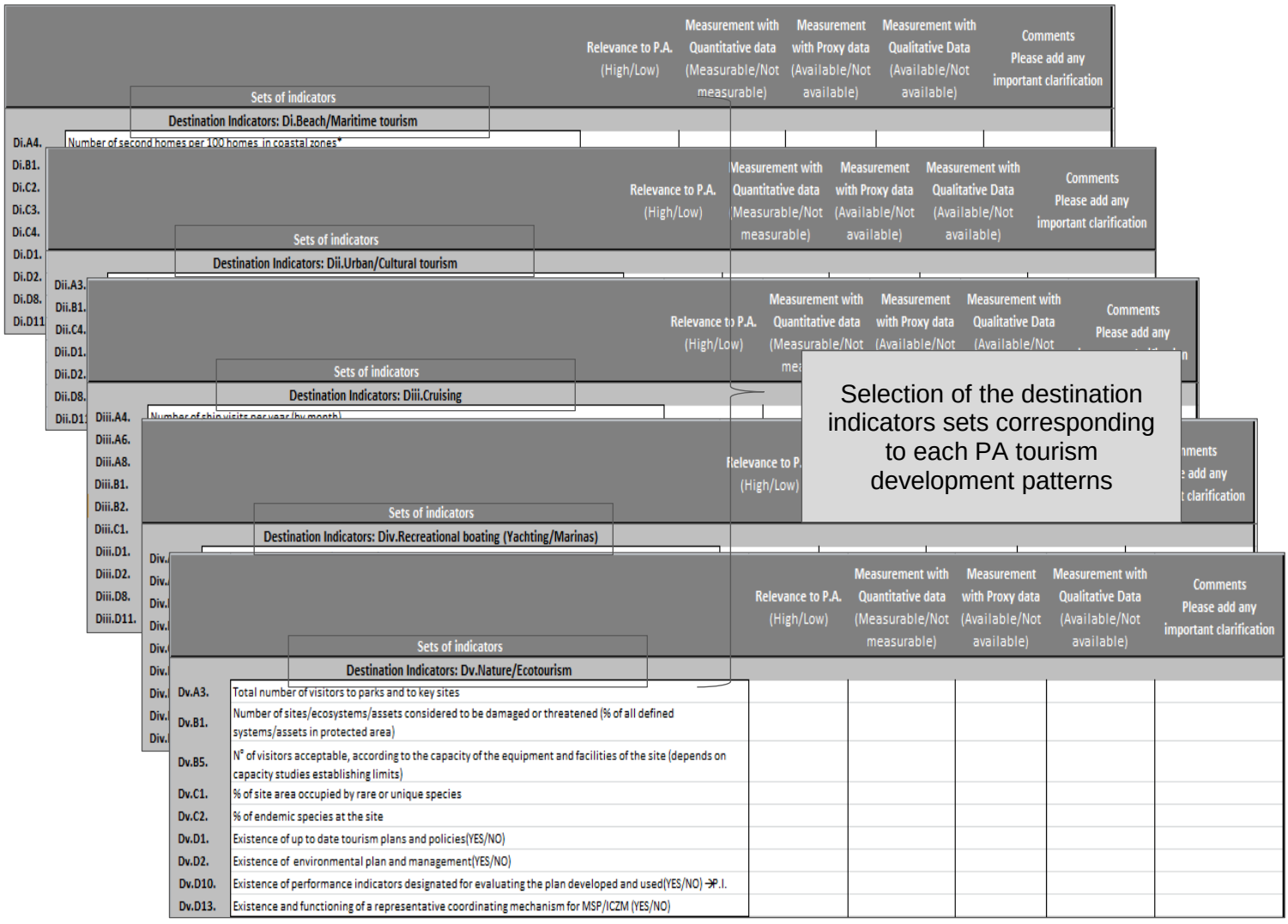


Source: UTH elaboration

In the same context of selecting and prioritizing the indicators to be measured and monitored in each PA, Pilot Area Coordinators are required to select the destination indicators sets (Beach/Maritime tourism, Urban/Cultural tourism, Cruising, Recreational boating, Nature/Ecotourism) that correspond to the current and future tourism development patterns developed in each PA (see Figure 3).

In order to customize the third set of Pilot area-specific indicators, Pilot Area Coordinators are asked to further highlight important tourism development aspects in each PA by introducing additional indicators from the Tourism Sustainability Toolkit developed in 3.16 (see Figure 4).

Figure 3: Selection of the destination indicators sets according to PA tourism development patterns



Source: UTH elaboration

Figure 4: Pilot Area Specific Indicators and Customization of the Draft Priority Indicators List

	Sets of indicators	Relevance to P.A. (High/Low)	Measurement with Quantitative data (Measurable/Not measurable)	Measurement with Proxy data (Available/Not available)	Measurement with Qualitative Data (Available/Not available)
	Pilot area-specific indicators				
P.A1.2.	% shoreline subjected to erosion				
P.A1.3.	Coastal area in degraded condition (low/medium/high)				
P.A1.6.	Coastal flooding events per year(number)				
P.A2.1.	Land occupied by artificial surfaces within the first 500m of coast (in %)				
P.A2.2.	% of area designated for tourism purposes				
P.A3.1.	Total tourist numbers (mean, monthly, peak) (categorized by their type of activity)				
P.A3.3.	Water use (total volume in liters or m^3 consumed and liters per tourist per day)				
P.A4.2.	Rate of loss of protected areas				
P.A5.1.	Total use of water by tourism sector (Tourism as a % of all users)				
P.A5.2.	Energy use by tourism industry as % of total				
P.B1.1.	Existence of a coastal planning management system				
P.B1.2.	Length of protected and defended coastline (km)				
P.B4.8.	Volume (m^3) of sediments dredged per year				
P.C1.2.	% environmental, social, cultural actions recommended in plan which have been implemented				
P.C3.1.	Level of tourism sector involvement in public policy (advisory bodies, review panels etc)				
...					
...					
...					

Customization of the Draft Priority Indicators List. Introduction of additional indicators to further highlight threats and enabling factors in each PA.

Source: UTH elaboration

II. Customization of Pilot Area Indicators

Building on the results of the first stage and elaborating further on Data Availability Tables, separate customized tables are created for each pilot area according to the priority given in each specific indicator, local particularities and tourism development patterns.

The customized tables include both low and high priority indicators (as identified during the first stage of the methodological process) to support the sustainability analysis of the pilot areas and feed future planning policies.

The tables are structured in two distinct levels of queries (see Figure 5). The first includes information already acquired from the first stage (Data Availability Tables) and the final measurement/assessment of the selected indicators as well as some necessary explanatory information (such as exact proxy or qualitative data used to calculate the indicators in case of quantitative data gaps, spatial level and source of the data used).

The second level of queries is addressed to Pilot Area Coordinators and relevant experts and requires information on satisfaction levels and trend evaluation – over the last ten years - related to each indicator.

Figure 5: Pilot Area Customized Tables – Process and structure

	Sets of indicators	Priority (High/Low)	Measurement (Quantitative data, Proxy Data, Qualitative Data)	Specify proxy or qualitative indicator	Spatial level	Source of data	Final Measurement	Do you consider this value (final measurement) satisfactory for your PA?	According to your knowledge, what has been the trend of the indicator in the last 10 years (decreasing, stable or increasing)?	If available and only for quantitative data, please specify trend value as ±%
	Core indicators									
C.A1.1.	% of tourism enterprises/establishments in the destination using a voluntary certification/labelling for environmental /quality/sustainability and/or Corporate Social Responsibility									
C.B1.1.	Number of tourist nights per month									
C.B2.1.	Average length of stay of tourists (nights)									
C.B3.1.	Direct tourism employment as % of total employment in the destination									
C.C1.1.	Number of tourists/visitors per 100 residents									
C.D1.4.	Average carbon footprint of tourists and same-day visitors travelling from home to the destination									
C.D3.1.	Waste production per tourist night compared to general population waste production per person (kg)									
C.D5.1.	Water consumption per tourist night compared to general population water consumption per resident night									

1st level of queries

2nd level of queries

Source: UTH elaboration

III. Development of Pilot Area Customized Toolkits

During this stage, only the most important indicators that should be measured and monitored are included in each Pilot Area Customized Toolkit in order to be used as a starting point for future planning and monitoring of tourism sustainability in the selected coastal destinations.

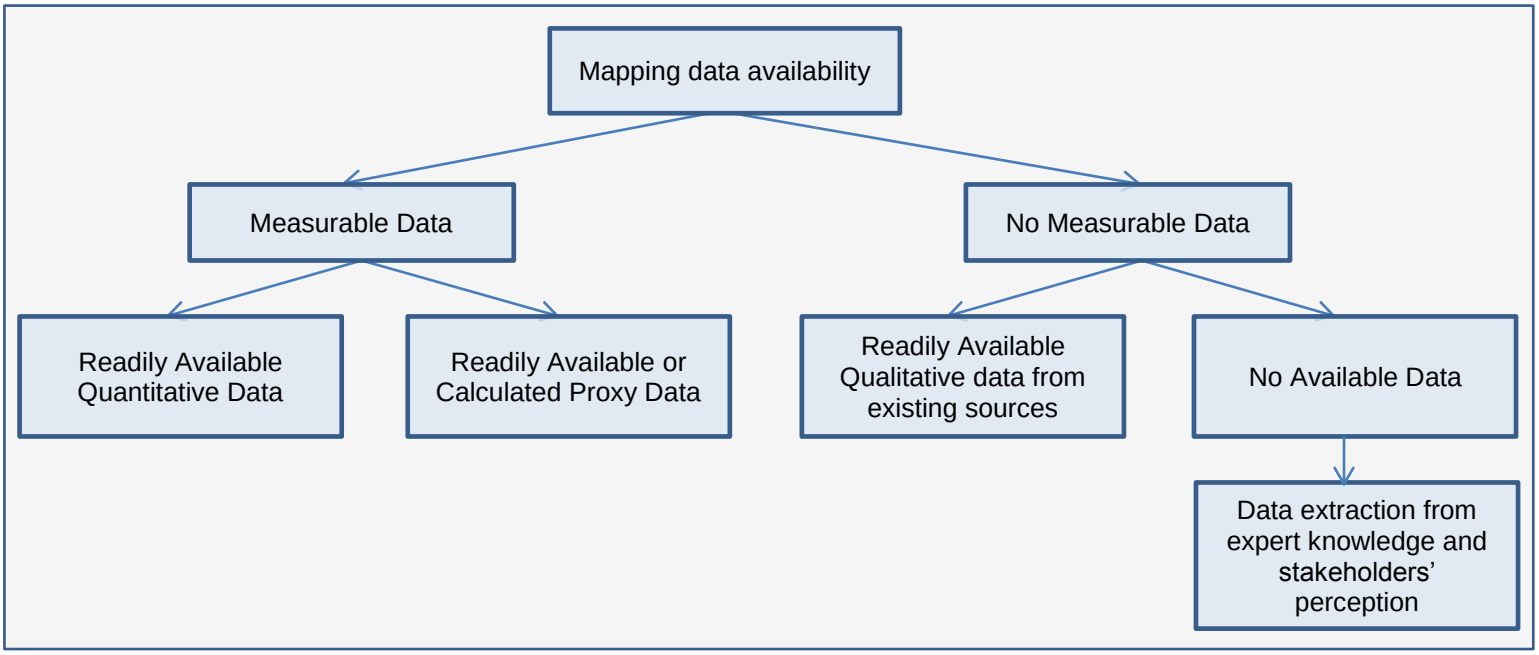
The indicators identified as of high relevance and priority, according to the previous stages, comprise the final toolkits for each pilot area. The toolkits also include some basic data and information regarding current state and future trends for each indicator (when available).

The outcomes of this stage are thoroughly explained and presented in Deliverable 3.17.2.

2.2 Mapping data availability and Dealing with data gaps

The identification of major data gaps and limitations in data accessibility constitutes a primary goal in the current methodological approach as it will guide future efforts in prioritizing, gathering and monitoring the sustainability indicators. Therefore, considering that data gaps and limitations seriously affect the results of the sustainability analysis conducted in Deliverable 3.17.2, a detailed *mapping* of the available data will be presented to outline the extent of such limitations in each pilot area as well as the need for future data collection, evaluation and monitoring (Figure 6).

Figure 6: Mapping data availability and Dealing with data gaps



Source: UTH elaboration

Moreover, as underlined previously, the use of qualitative data in cases of important data gaps may be considered to replace quantitative analysis with information coming from existing research, expert knowledge and stakeholder consultation. Several studies elaborate on different methods for incorporating stakeholders' perceptions in the process of measuring tourism sustainability.

In this context, Pérez et al. (2017) developed a sustainability index through the combination of representative indicators based on stakeholder's perceptions in order to measure the sustainability degree of tourism destinations. The research underlines the necessity of incorporating stakeholder's perceptions in the overall process of

tourism planning, decision - making and destination management. Building on this principle, an initial set of indicators was chosen to measure tourism sustainability in different destinations with the consultation of local stakeholders and experts' contribution. The quantification process was achieved through an applied survey addressed to local population and tourists. During the analysis, weights were attributed to each indicator based on participative methods (with reference to the Analytic Hierarchy Process, Group Analysis and Budget Allocation Process). Using an expert panel consisting of 26 stakeholders, the analysts adopted a Delphi technique to attain the weights in order to better reflect the priorities of those involved in the decision making process.

Figure 7: Attributing weights using the participative methods - Delphi technique

N°	Indicator	Dimension	Sign	Weight
IS_1	Perception of the local population regarding whether improved roads and transport infrastructure are results of tourism.	Social	+	0,503
IS_2	Perception of the local population regarding whether improved public services are results of tourism.	Social	+	0,458
IS_3	Perception of the local population regarding whether the tourists have an undesirable effect in the region life style.	Social	-	0,562
IS_4	Perception of the local population regarding with what the tourism contributes to keep the young population in the city.	Social	+	0,539
IS_5	Perception of the local population regarding whether the life quality increases due the tourism.	Social	+	0,762
IS_6	Evaluation of the tourists about the destination's security.	Social	+	0,971
IS_7	Evaluation of tourists about the quality of public services (lighting, transport, banks, etc).	Social	+	0,792
IE_8	Perception of the relation quality–price of lodging in destination (state or private).	Economic	+	0,803
IE_9	Perception of the relation quality–price of restaurants in the destination.	Economic	+	0,701
IE_{10}	Evaluation of the quality of tourism's employees (Lodging, gastronomy and tour guides).	Economic	+	0,775

Source: Pérez et al. 2017

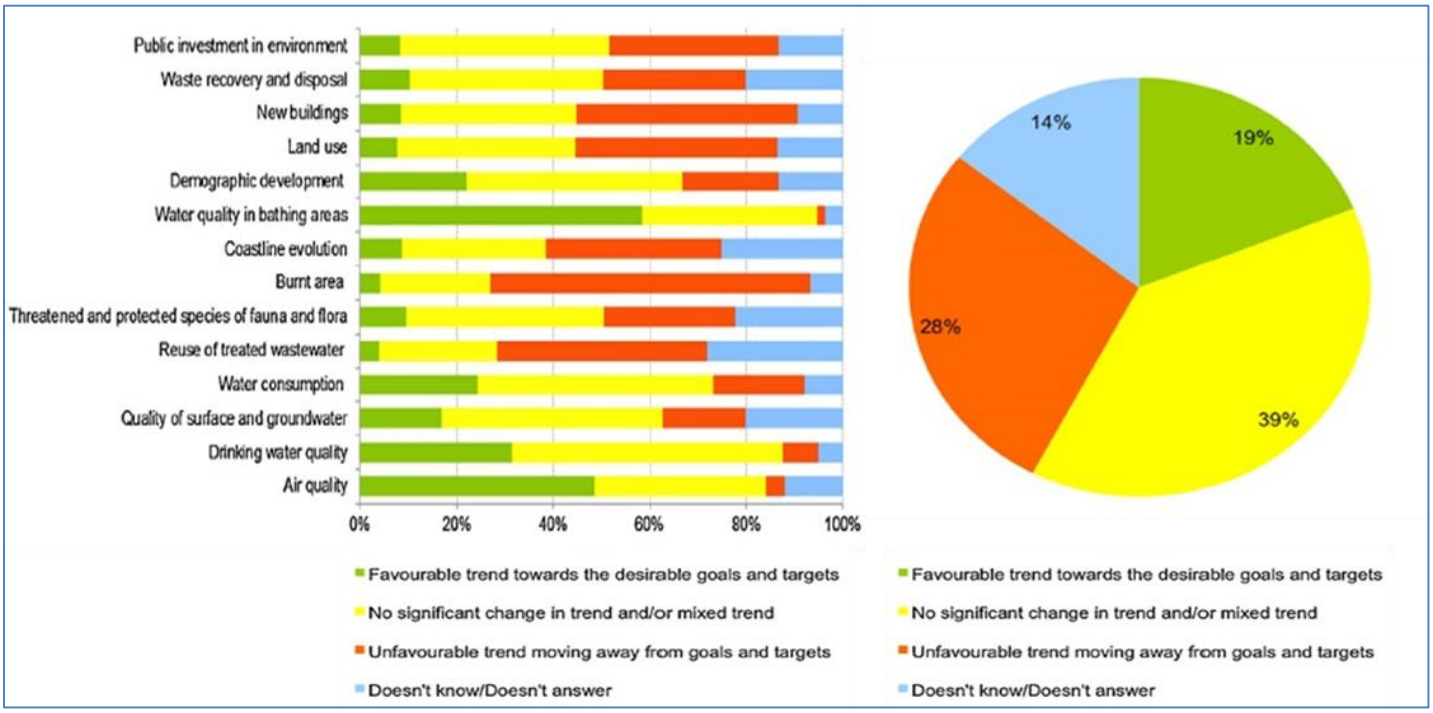
In the same sense, the European Environmental Agency (2001) produced a series of indicator reports on Environmental signals in order to provide new insight into major environmental trends in the EU. Indicators that cover the most important aspects of the socio-economic and environmental framework were selected by using the DPSIR framework (Driving forces, Pressures, State of the environment, Impacts and Responses) and assessed according to their overall progress (EEA, 2001):

i. Positive trend, moving towards target
ii. Some positive development, but either insufficient to reach target or mixed trends within the indicator
iii. Unfavorable trend

Building on this method, Mascarenhas et al. (2014) followed an entirely qualitative approach to assess a set of headline indicators for the Algarve region in Portugal in an attempt to show that an evaluation of sustainability performance by stakeholders

can be used as an indirect method of evaluating the strengths and weaknesses of technical indicator sets. In this context, local participatory workshops were conducted in each municipality with representatives from public administrations, academic community, non-governmental organizations, professional associations as well as key private companies. The participants assessed each indicator according to the three EEA qualitative classifications described above, providing the results illustrated in Figure 8.

Figure 8: Results of stakeholders' self-assessment per environmental headline indicator (left) and aggregated scores for all indicators (right)



Source: Mascarenhas et al., 2014

Although data availability is an important criterion for the final selection of indicators, it should not restrain the selection and use of indicators identified as of high relevance and priority to the destination. The assessment of indicators by measuring stakeholders' perception could be considered as an alternative method to acquire estimations and, in the case of Co=Evolve, is strongly suggested to be implemented during the workshops foreseen in **Work Package 4: Testing** in order to further develop and promote the active participation of stakeholders.

3. Expected outcomes and application of the customized toolkits

The current report represents the methodological process that should be applied by each Pilot Area in order to develop a site-specific (customized) system of indicators. Each indicator system is aimed to act as a starting basis in:

- formulating sustainable development strategies in each destination/pilot area (Task 3.18)
- implementing strategic guidelines and actions in Work Package 4, where the needs for data collection, evaluation and monitoring will be precisely defined during workshops with local stakeholders

The preliminary outcomes of the methodological process will be presented in *Deliverable 3.17.2 Evaluation of tourism sustainability in the Pilot Areas* and include the following:

- Sustainability analysis of the seven pilot areas based on currently available data including a short analysis on data availability (Mapping data availability)
- Production of separate customized toolkits for each pilot area in order to measure, evaluate and monitor tourism sustainability and to be used for current and future planning activities and policies.
- Comparative analysis among the PAs

The combined outcomes of Deliverables 3.17.1 and 3.17.2 will feed ***Work Package 4: Testing*** with the required methodologies and toolkits for evaluating and monitoring actions and future planning activities in each pilot area.

4. References

- European Environment Agency (2001). *Environmental signals 2001*. Regular indicator report. Copenhagen: Office for Official Publications of the European Communities.
- Mascarenhas, A., Nunes, L. and Ramos, T. (2014). Exploring the self-assessment of sustainability indicators by different stakeholders. *Ecological Indicators*, 39, pp.75-83.
- Pérez, V., Santoyo, A., Guerrero, F., León, M., da Silva, C. and Caballero, R. (2017). Measuring the sustainability of Cuban tourism destinations considering stakeholders' perceptions. *International Journal of Tourism Research*, 19(3), pp.318-328.

ANNEX

Figure 1: Data Availability Table Sheet

	Sets of indicators	Relevance to P.A. (High/Low)	Measurement with Quantitative data (Measurable/Not measurable)	Measurement with Proxy data (Available/Not available)	Measurement with Qualitative Data (Available/Not available)
	Core indicators				
C.A1.1.	% of tourism enterprises/establishments in the destination using a voluntary certification/labelling for environmental /quality/sustainability and/or Corporate Social Responsibility				
C.B1.1.	Number of tourist nights per month				
C.B2.1.	Average length of stay of tourists (nights)				
C.B3.1.	Direct tourism employment as % of total employment in the destination				
C.C1.1.	Number of tourists/visitors per 100 residents				
C.D1.4.	Average carbon footprint of tourists and same-day visitors travelling from home to the destination				
C.D3.1.	Waste production per tourist night compared to general population waste production per person (kg)				
C.D5.1.	Water consumption per tourist night compared to general population water consumption per resident night				
C.D5.2.	% of tourism enterprises taking actions to reduce water consumption				
C.D6.2.	% of tourism enterprises that take actions to reduce energy consumption				
C.D6.3.	% of annual amount of energy consumed from renewable sources (Mwh) compared to overall energy consumption at destination level per year				
C.D7.1.	% of local enterprises in the tourism sector actively supporting protection, conservation and management of local biodiversity and landscapes				
	Destination Indicators: Di.Beach/Maritime tourism				
Di.A4.	Number of second homes per 100 homes in coastal zones*				
Di.B1.	% of tourist infrastructure (hotels, other) located in coastal zones*				
Di.C2.	% of beaches awarded the Blue Flag				
Di.C3.	Costs of erosion-protection measures (e.g. sea walls.)				
Di.C4.	Beach nourishment: sand volume and extension of the restored beach (m3 and m2)				
Di.D1.	Existence of up to date tourism plans and policies (YES/NO)				
Di.D2.	Existence of a land use or development plan (YES/NO)				
Di.D8.	Existence of performance indicators designated for evaluating the plan developed and used(YES/NO)				
Di.D11.	Existence and functioning of a representative coordinating mechanism for MSP/ICZM (YES/NO)				
	Destination Indicators: Dii.Urban/Cultural tourism				
Dii.A3.	% of total tourists visiting in peak month and average for the year				
Dii.B1.	Total number of tourists per square Km in key sites (crowding/spatial distribution)				
Dii.C4.	% of sites under a management and monitoring system for protection of cultural sites				
Dii.D1.	Existence of up to date tourism plans and policies (YES/NO)				
Dii.D2.	Existence of a land use or development plan(YES/NO)				
Dii.D8.	Existence of performance indicators designated for evaluating the plan developed and used(YES/NO)				
Dii.D11.	Existence and functioning of a representative coordinating mechanism for MSP/ICZM (YES/NO)				
	Destination Indicators: Diii.Cruising				
Diii.A4.	Number of ship visits per year (by month)				
Diii.A6.	Average duration of stay in port (in days)				
Diii.A8.	Average spending per cruise ship visitor (€)				
Diii.B1.	Volume of fresh water on-loaded at port (m^3)				
Diii.B2.	Volume of waste accepted for disposal (solid, liquid) at port (m^3)				
Diii.C1.	Maximum capacity of docking facilities (number)				
Diii.D1.	Existence of up to date tourism plans and policies(YES/NO)				
Diii.D2.	Existence of Master Plan(YES/NO)				
Diii.D8.	Existence of performance indicators designated for evaluating the plan developed and used(YES/NO)				
Diii.D11.	Existence and functioning of a representative coordinating mechanism for MSP/ICZM (YES/NO)				
	Destination Indicators: Div.Recreational boating (Yachting/Marinas)				
Div.A2.	Number of yachts per year (by month)				
Div.A4.	Average duration of stay in port (in days)				
Div.B1.	Volume of fresh water on-loaded at port(m^3)				
Div.B2.	Volume of waste accepted for disposal (solid, liquid) at port(m^3)				
Div.C1.	Number of berths and moorings for recreational boating				
Div.D1.	Existence of up to date tourism plans and policies(YES/NO)				
Div.D2.	Existence of a land use or development plan(YES/NO)				
Div.D8.	Existence of performance indicators designated for evaluating the plan developed and used(YES/NO)				
Div.D11.	Existence and functioning of a representative coordinating mechanism for MSP/ICZM (YES/NO)				
	Destination Indicators: Dv.Nature/Ecotourism				
Dv.A3.	Total number of visitors to parks and to key sites				
Dv.B1.	Number of sites/ecosystems/assets considered to be damaged or threatened (% of all defined systems/assets in protected area)				
Dv.B5.	N° of visitors acceptable, according to the capacity of the equipment and facilities of the site (depends on capacity studies establishing limits)				
Dv.C1.	% of site area occupied by rare or unique species				
Dv.C2.	% of endemic species at the site				
Dv.D1.	Existence of up to date tourism plans and policies(YES/NO)				
Dv.D2.	Existence of environmental plan and management(YES/NO)				
Dv.D10.	Existence of performance indicators designated for evaluating the plan developed and used(YES/NO) →P.I.				
Dv.D13.	Existence and functioning of a representative coordinating mechanism for MSP/ICZM (YES/NO)				
	Pilot area-specific indicators				
P.A1.2.	% shoreline subjected to erosion				
P.A1.3.	Coastal area in degraded condition (low/medium/high)				
P.A1.6.	Coastal flooding events per year(number)				
P.A2.1.	Land occupied by artificial surfaces within the first 500m of coast (in %)				
P.A2.2.	% of area designated for tourism purposes				
P.A3.1.	Total tourist numbers (mean, monthly, peak) (categorized by their type of activity)				
P.A3.3.	Water use (total volume in liters or m^3 consumed and liters per tourist per day)				
P.A4.2.	Rate of loss of protected areas				
P.A5.1.	Total use of water by tourism sector (Tourism as a % of all users)				
P.A5.2.	Energy use by tourism industry as % of total				
P.B1.1.	Existence of a coastal planning management system				
P.B1.2.	Length of protected and defended coastline (km)				
P.B4.8.	Volume (m^3) of sediments dredged per year				
P.C1.2.	% environmental, social, cultural actions recommended in plan which have been implemented				
P.C3.1.	Level of tourism sector involvement in public policy (advisory bodies, review panels etc)				
...					