

# SUSTAIN

## MEASURING COASTAL SUSTAINABILITY

A guide for the self-assessment of sustainability  
using indicators and a means of scoring them

OCTOBER 2012



## THE SUSTAIN PROJECT

Funded through the INTERREG IVC programme, SUSTAIN has been a 3-year project part-funded by the European Regional Development Fund. It was a Regional Initiative addressing environment and risk prevention (Priority 2 of the programme) and the sub-theme water management. The project budget was €1.8m.

The objective of SUSTAIN was to create a fully implementable policy tool to help coastal authorities and communities throughout Europe to deliver sustainability on Europe's coast. This tool will be applicable to all 22 coastal states of the European Union. It is based on a set of easily

measurable sustainability indicators that were developed and assessed during the lifetime of the project to enable Authorities to measure effectively the sustainability of our coasts.

The project partnership was made up of 12 partner organisations from across the EU. The lead partner for the project was the Coastal & Marine Union – EUCC (The Netherlands).

Visit [www.sustain-eu.net](http://www.sustain-eu.net) where you can find more information as well as the SUSTAIN Publications in 9 European languages!

## COLOPHON

SUSTAIN Partnership. 2012. **MEASURING COASTAL SUSTAINABILITY, A guide for the self-assessment of sustainability using indicators and a means of scoring them.** SUSTAIN Project / INTERREG IVC.

This guide has been developed with the contribution of all partners of SUSTAIN.

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*The Interregional Cooperation Programme INTERREG IVC, financed by the European Union's Regional Development Fund, helps Regions of Europe work together to share experience and good practice in the areas of innovation, the knowledge economy, the environment and risk prevention. EUR 302 million is available for project funding but, more than that, a wealth of knowledge and potential solutions are also on hand for regional policy-makers.*

# INTRODUCTION

SUSTAIN has developed an indicator-based methodology and scoring system which enables a self-assessment approach for local and regional authorities, to evaluate their sustainability performance for the purpose of improving the management of coastal zones. It enables coastal authorities to determine whether they are reaching their strategic sustainability goals and to identify situations requiring management intervention.

Relevant indicators have been chosen to cover 22 distinct Issues within the four recognisable pillars of sustainability i.e. Governance, Economics, Environmental Quality and Social Well-being. There are both Core and Optional Indicators to reflect locally specific situations which can vary across Europe's many diverse regions. A Checklist approach has been introduced in respect of the

Governance pillar, rather than indicators which are notoriously difficult to measure.

Data for the relevant indicators is fed into a newly developed policy tool, DeCyDe-for-Sustainability. This is a user-friendly, spreadsheet tool that allows the Core Indicators to be scored numerically, to support the self-assessment and to determine, whether an Authority is moving towards a sustainable end-point. Implementing the tool is done through participatory workshops where discussion about the Issues, Indicators and Data is as important as the numerical value obtained.

Together, the SUSTAIN Indicator Set and DeCyDe-for-Sustainability tool constitute a user-friendly, rapid implementation, self-assessment tool. It respects the time limitations of policy-makers and other stakeholders.



*Temple of Great Gods, Samothraki, Greece, photo Sophia B. [www.samothrakisphotoblog.com](http://www.samothrakisphotoblog.com)*



# 1. Why do we need to measure sustainability?

Sustainable development means that the needs of the present generation should be met without compromising the ability of future generations to meet their own needs. Sustainability is a major objective of the European Union and is about safeguarding the Earth's capacity to support life in all its diversity. It aims at the continuous improvement of the quality of life and well-being on Earth for present and future generations. For many years now, the European Commission and Member States have been struggling to implement the concept of sustainability. However, despite many good intentions, there is, as yet, no evidence that coastal management has reached a point where our natural resources are being used sustainably.

There are two key reasons for this: firstly, there is no defined methodology by which the degree of sustainability can be measured by authorities. Secondly, there is no commonly agreed set of indicators that can be used to measure sustainability. Within coastal zones, there are many hundreds of indicators which purport to give information about sustainability but, in reality, none of them do so effectively – because that is not their purpose – as they are, in general, state-of-the-coast indicators.



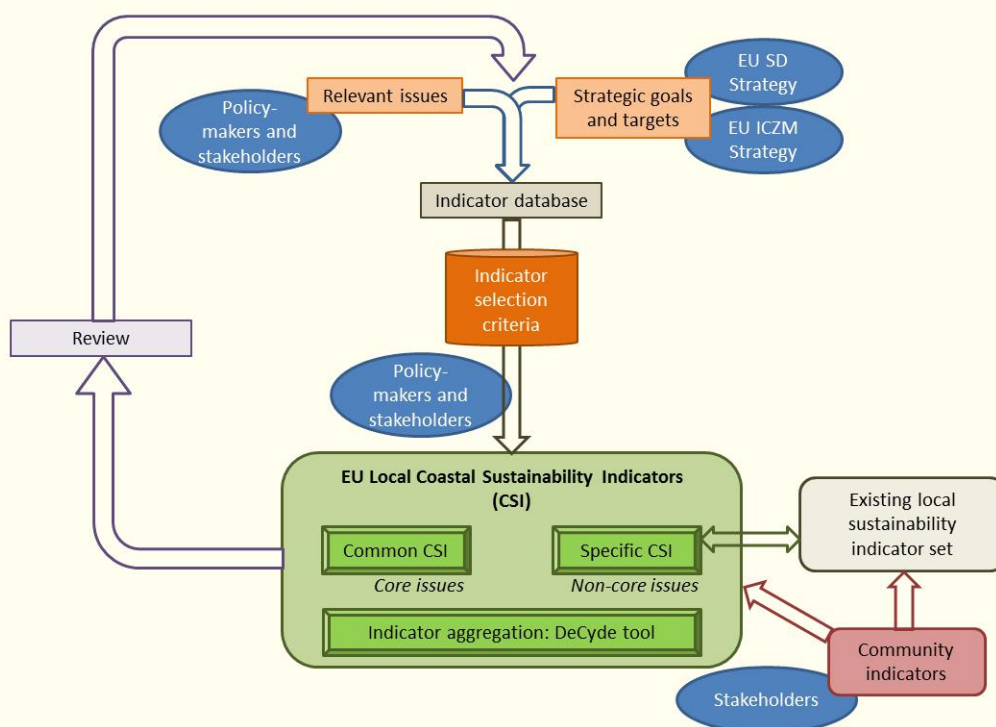
*Cabo Espichel, Portugal, photo Tamara Ristić*

## 2. Linking Sustainability to Indicators

Sustainability is more of a generalised concept and it is often criticized as being difficult to translate it in operational terms. It does not have defined parameters that can be scientifically determined. Many of the indicators are very specific and many measure parameters which are beyond the sphere of influence of regional/local authorities. Whilst assessing sustainability at local or regional Authority level, it is important to know the policy context in which the indicators and the specific instruments e.g. legislation being applied. Therefore, a **step-wise, cyclical procedure** has been developed<sup>1</sup> which takes us from the starting point to the expected end point in a logical manner.

It incorporates the European strategic goals for sustainable development and integrated coastal zone management, as well as the most relevant issues in those domains. Having agreed strategic goals and targets, policy-makers can measure the relevant indicators from various data-bases. The selection criteria for indicators and the analysis of international, national and local indicators is explicitly addressed in order for the SUSTAIN indicators to be chosen by a group of involved stakeholders. This approach provides a policy maker with a degree of flexibility so that indicators can be tailored to the needs of the strategic goals of the authority.

The approach is given below:-



<sup>1</sup> By ARH Tejo in conjunction with The Centre for Environmental and Sustainability Research, University of Lisbon.

### 3. The SUSTAIN Indicator Set

The Indicator Set has been based on indicators that are generally already in common usage and ones that, according to EU legislation, should be regularly monitored. New indicators, although possibly more relevant to sustainability have not been introduced if there is no data-base from which to measure them.

SUSTAIN offers two sets of Indicators differing from the more traditional approach of applying a fixed, standard indicator set.

- **CORE** indicators which should be used at all times where relevant data is available. They are considered to cover essential aspects of coastal sustainability.
- **OPTIONAL** indicators which reflect local/regional specificities and which can be implemented and adjusted according to the local/regional circumstances.

These indicators have been robustly selected using three criteria: a) relevance to sustainability, b) availability of data, and c) ability to be scored. These have been refined as result of a review test performed about the suitability of all core indicators through a semi-quantitative method.

They represent the four pillars of sustainability: governance, environmental quality, economics and social well-being. In order to show their relevance to sustainability the different indicators have been grouped into a number of Issues. In total, there are **22 core Issues** broken down as follows:

|                              |                 |
|------------------------------|-----------------|
| <b>Governance</b>            | <b>5 issues</b> |
| <b>Economics</b>             | <b>4 issues</b> |
| <b>Environmental Quality</b> | <b>8 issues</b> |
| <b>Social Well-being</b>     | <b>5 issues</b> |

#### **Governance: Issues and Checklist**

These issues and checklist are used to measure the consistent management, cohesive policies, guidance, processes and decisions for the sustainable use of the coast. Traditionally, indicators to measure governance have proven to be very difficult to define and evaluate. Therefore, SUSTAIN has used an alternative approach which poses a series of grouped questions which require only a positive or negative response (with a don't know' option). They have been structured into 5 groups of issues:

***Policies / strategies for sustainability*** (7 indicators)

***Monitoring tools for sustainability*** (6 indicators)

***Human resources/capacity building*** (4 indicators)

***Implementation of good management practices*** (4 indicators)

***Stakeholder involvement/public participation*** (3 indicators).



*Irish Sea Maritime Forum, UK*



### *Examples of Governance issues and selected questions*

| ISSUE   | QUESTION  |
|---|---|
| Policies/ strategies for sustainability       | A sustainable development strategy which includes specific references to the coast and adjacent marine is in place?                     |
| Monitoring tools for sustainability           | Sustainability targets have been set?   |
| Human resources capacity building             | Local/regional administrations have adequate capacity of staff to deal with sustainability matters?                                     |
| Implementation of good management practices   | There is an identifiable point of contact for coastal sustainability matters?   |
| Stakeholder involvement/ public participation | All stakeholders involved in the SUSTAIN core and relevant optional indicators have been identified and are both informed and involved? |

*See Annex 1 for the full Governance issues and checklist.*



*Sesimbra, Portugal, photo Tamara Ristić*

## ECONOMICS: Issues and Indicators

These indicators have been chosen to show whether a vigorous and sustainable coastal economy is being promoted and supported. Four key issues have been identified which are deemed to be important for the economic contribution of sustainability in coastal zones:

**Economic Opportunity** (3 core indicators and 1 optional)

**Land Use** (1 core indicator and 1 optional indicator)

**Tourism** (3 core indicators and 2 optional indicator)

**Transportation** (2 core indicators and 2 optional indicators).

A further three Optional Issues have been identified:

**Economic Performance** (1 optional indicator)

**Energy & Climate Change** (1 optional indicator)

**Fisheries and Aquaculture** (1 optional indicator)

Therefore, there are **9 Core indicators for Economics** which may be supplemented with up to 9 optional indicators (see Annex 2).

### Examples of Economics issues and selected indicators

| ISSUE                | CORE INDICATORS                            |
|----------------------|--|
| Economic Opportunity | Employment by sector                       |
| Land Use             | People and assets at risk in coastal areas |
| Tourism              | Tourism Intensity                          |
| Transportation       | Transport usage                            |



Warnemünde beach, Germany, photo Gerald Schernewski



## ENVIRONMENTAL QUALITY: Issues and Indicators

These indicators have been selected to demonstrate the quality of the coastal environment and the availability of sustainable environmental practices and the way they are promoted. Eight core issues have been identified as important in a Pan-European context. They are:

**Air Pollution** (1 core indicator)

**Biodiversity and Natural Resources Management** (2 core indicators and 3 optional indicators)

**Change at the coast** (2 core indicators)

**Energy & Climate Change** (3 core indicators and 1 optional indicator)

**Land Use** (1 core indicator and 3 optional indicators)

**Public Health and Safety** (1 core indicator)

**Waste Management** (2 core indicators)

**Water resources and Pollution** (5 core indicators and 7 optional indicators)

Further one Optional Issue has been identified:

**Fisheries and Aquaculture** (1 optional indicator)

Therefore, there are **17 Core indicators for Environmental Quality** which may be supplemented with up to 15 optional indicators. The higher number of indicators for Water Resources and Pollution reflects the importance of clean water for coastal activities.

### *Examples of Environmental Quality issues and selected indicators*

| ISSUE   | CORE INDICATORS  |
|---|--|
| Air Pollution                                 | Air quality  |
| Biodiversity and Natural Resources Management | Area of land and sea protected by statutory designations |
| Change at the coast                           | Coastal erosion and accretion                            |
| Energy & Climate Change                       | Energy consumption                                       |
| Land Use                                      | Area of built-up land                                    |
| Public Health and Safety                      | Human exposure to harmful noise levels                   |
| Waste Management                              | Waste production and disposal method                     |
| Water resources and Pollution                 | Quality of bathing water                                 |

*See Annex 3 for the full set of Environmental Quality Indicators.*

## SOCIAL WELL-BEING: Issues and Indicators

The indicators for social well-being have been chosen to promote social unity and resilience. Five core issues have been selected, being:

**Demography** (1 core indicator)

**Equity** (1 core indicators and 3 optional indicators)

**Education and training** (1 core indicator and 1 optional indicator)

**Local and cultural Identity** (2 core indicators and 2 optional indicators)

**Public Health and Safety** (3 core indicators and 3 optional indicators.)

Therefore, there are **8 Core indicators for Social Well-being** which may be supplemented with up to 9 optional indicators (see Annex 4).

### Examples of Social Well-being issues and selected indicators

| ISSUES                      | CORE INDICATORS   |
|-----------------------------|---|
| Demography                  | Demographic dependency  |
| Equity                      | Actions for the promotion of equal opportunities and social inclusion |
| Education and training      | Educational attainment of the population                              |
| Local and cultural Identity | Local products  |
| Public Health and Safety    | Provision of health care services                                     |

### IN SUMMARY

| PILLAR                | ISSUES | CORE IND. | OPTIONAL IND. |
|-----------------------|--------|-----------|---------------|
| GOVERNANCE            | 5      | 24        | 0             |
| ECONOMICS             | 4      | 9         | 9             |
| ENVIRONMENTAL QUALITY | 8      | 17        | 15            |
| SOCIAL WELL-BEING     | 5      | 8         | 9             |

## 4. The DeCyDe Decision Support Tool

### a. What is DeCyDe-for-Sustainability?

DeCyDe-for-Sustainability is a user-friendly, spreadsheet-based, self-assessment, decision-support tool which gives a numerical value to individual indicators<sup>2</sup>. It is an approach which is in line with the trend of public policies to move from a purely conceptual and theoretical view to a more pragmatic approach, based upon observed data. Unfortunately, many current decision-support systems are both too sophisticated and complex and require specialist or academic knowledge. Rather than supporting decision-makers they are simply ignored and not used. This has the effect that decision-makers have to rely upon their intuition and judgment, and even interests, to reach decisions.

DeCyDe-for-Sustainability integrates logical processes with established scientific and local knowledge, data and experience. It also enables a high degree of participation by interested stakeholders to incorporate their views, evaluations and perspectives in the process. It can accommodate different kinds of decision-making problems when multiple-decision alternatives exist. It offers a method that truly supports decision-makers and stakeholders to understand and justify the main issues that are involved in the trade-offs between different decision alternatives.

### b. How does it work?

DeCyDe-for-Sustainability has three self-contained and inter-related steps:

1. to find the data relating to the indicators,
2. to score the indicators based upon the data,
3. to weight the Pillars and Issues.

This process leads to a single numerical value being attributed to the Indicator Set.

DeCyDe-for-Sustainability then allows decision-makers to predict how the existing situation can be changed if, for example, the scores of one or more Pillars or Issues are changed according to different policy options. It shows in which areas sustainability is strong and weak and allows proactive choice of alternative policies.

### Step1: Indicator data collection

DeCyDe-for-Sustainability has been built specifically for each core and optional SUSTAIN indicator. Finding the necessary information concerning each indicator actually forms the baseline work. The information provides a set of essential data that is needed in order to guarantee the unbiased character of the results of the decision process.

### Step 2: Scoring the indicators

The scoring of each indicator is achieved through a given ranges of values. The “scoring through ranges” approach converts state-of-the-coast indicators into sustainability indicators. This is because the score attributed immediately gives a reference instead of just a single, snap-shot figure. The approach to score through ranges instead of using precise values provides the method with flexibility: even data which cannot be specifically identified or might be considered imprecise can be used if identified within a range. Normally, indicators would be excluded if their precise value could not be found.

The ranges of values are mainly defined by EU Directives and when these do not cover the specific parameters, limits provided by International Bodies are used. National and local regulations are also considered.

<sup>2</sup> It was developed by Isotech. Ltd, Research and Consultancy, Cyprus ([www.isotech.com.cy](http://www.isotech.com.cy)) and modified for SUSTAIN through Kouklia Community Council (2010-11)



| SELF -ASSESSMENT AND SCORING FOR SUSTAINABILITY RESULTS |   |                  |
|---|---|------------------|
| PILLARS   | INDICATORS                                    | Indicators Score |
| ECONOMICS   | Economic Opportunity                          | 5,56             |
|   | Land Use                                      | 2,00             |
|   | Tourism                                       | 4,00             |
|   | Transportation                                | 7,00             |
|   |   | 18,56            |
| ENVIRONMENTAL QUALITY                                   | Air Pollution                                 | 3,00             |
|   | Biodiversity and Natural Resources Management | 5,00             |
|   | Change at the coast                           | 6,00             |
|   | Energy & Climate Change                       | 4,67             |
|   | Land use                                      | 2,00             |
|   | Public Health and safety                      | 6,00             |
|   | Waste Management                              | 4,67             |
|   | Water resources and Pollution                 | 3,40             |
|   |   | 34,73            |
| SOCIAL WELL-BEING                                       | Demography                                    | 4,00             |
|   | Equity  | 6,00             |
|   | Education and Training                        | 2,00             |
|   | Local and cultural identity                   | 0,00             |
|   | Public Health and Safety                      | 4,67             |
|   |   | 16,67            |
| GOVERNANCE  | Policies/ strategies for sustainability       | 4,57             |
|   | Monitoring tools for sustainability           | 5,33             |
|   | Human resources capacity building             | 5,25             |
|   | Implementation of good management practices   | 3,00             |
|   | Stakeholder involvement/ public participation | 10,00            |
|   |   | 28,15            |
| <b>TOTAL</b>  |   | <b>98,11</b>     |

NOTE: This is the final table for the self assessment and scoring of sustainability tool, without involving the weighting part. It is a stand alone tool that provides the "scores for sustainability" that can be compared year by year to check the developing process of each area in relation to sustainability principles. Any user that would like to proceed to the next step of weighting decisions please contact ISOTECH Ltd (xenia@isotech.com.cy) for further instructions.

Example from **DeCyDe-for-Sustainability tool**, available for download at [www.sustain-eu.net](http://www.sustain-eu.net)

### Step 3: The Weighting

The issues and the pillars under which the indicators fall are organised into matrices (based on the concept of comparing couples). The number of matrices, i.e. the number of levels that will be incorporated in the decision support method has to be defined. Weighting the Issues and Pillars allows an Authority to self-determine the relevant importance of these different parameters.

When these three steps have been completed, the spreadsheet tool can be used as a decision-support tool. Decision makers can predict how the existing situation can be changed if, for example, they want to change the score of one or more Issues. That means that users of the DeCyDe-for-Sustainability tool can easily predict what will happen should they invest resources to support the change of score and thus the range, of a given indicator e.g. by increasing resources in waste recycling by moving them from

aquaculture production. Alternatively, they can forecast what will happen if they change the importance among the four main pillars e.g. putting more resources into Economics and less in Environmental Quality through a change in their policy. Through this exercise, the decision makers can evaluate and assess a large range of ideas and actions within different policy options. They have a "number" that gives them their "score" each time they would take a decision, based on real data of the existing situation. They have the chance to anticipate the impacts of their decisions, identify the pros and cons of different options and discuss them among the entire group of decision actors and eventually reach a preferred decision. Because this decision is taken through a participatory process, with the consensus of the decision actors, there is a greater likelihood that they will all commit to support the implementation of their decision. This is one important issue: promoting the implementation of decisions through the consensus of decision actors.

## 5. The Stepwise Process of Measuring Sustainability Using the SUSTAIN Self-Assessment Tool

Measuring sustainability is as easy as the following five steps indicate:

1. Collect data for as many of the Core Indicators as possible in the units mentioned in the Indicator Set. All the indicators can be found in Annexes 1-4.

It should be noted that the largest effort in measuring sustainability is collecting the relevant data for each indicator. In many cases, it must be realised that the data:

- can be quite dispersed and time to find the data is an essential part of the methodology,
- has often been collected in monitoring units other than those specified in the various European Directives,
- is often only available from different years, and
- is only occasionally available at the needed spatial level i.e. it is available nationally or regionally but not locally and sometimes it is simply not available at all.

Nonetheless, as much of the data should be used as possible and absence of a full data set need not be a deterrent to using and scoring the data that are available, provided that the same data sources are consistently used each time sustainability is measured. Eventually, there has to be a trade-off between the amount of time being spent on the search for data and the number of indicators for which the information has been found. As the use of the DeCyDe-for-Sustainability tool is an iterative process, data gaps present during one assessment exercise may be remedied by the time the next iteration of assessment is undertaken e.g. data sets may be uncovered, or local decision-makers may decide to resource the collection of

data where gaps were identified during the initial assessment

2. In consultation with relevant stakeholders, data should be found for as many of the Optional indicators which are considered most appropriate for the region/municipality.

It should be remembered that a good set of data is crucial for the success of the remainder of the work.

3. The value of each indicator when found is simply entered into the relevant cell in the spreadsheet where the score is automatically attributed. As each score is entered, the overall scores will also alter automatically.

4. When all the scores have been entered for all the core indicators representing the four pillars of sustainability, a single numerical figure is automatically generated.

5. The next step is the weight the Pillars and Issues. This is best achieved through a structured participatory workshop with a trained facilitator/expert who is not imposing decisions but supporting the process and who has a good knowledge of the overall objectives, of the data and of local/case specific characteristics. During the workshop, comparisons are made between the four Pillars and/or the Issues within the Pillars. When the various weightings are entered into the relevant cells, the spreadsheet automatically recalculates the overall score obtained above. This is the final score for sustainability performance in your region.

The first time the exercise is completed, the number can be regarded as a reference value against which all future exercises can be compared, provided the same indicators are used each time. The results from a local authority that has completed all but the weighting as presented on page 12. It can be seen that if the exercise is repeated in the future, a comparison can be made between the two applications to determine if

progress is being made towards a more sustainable future. If the result, when the exercise is completed for the first time, is considered a base level (e.g. = 100) then any future change can be converted to a percentage increase or decrease. In this way, it is also possible to compare the effort being put into sustainability in any number of localities.



*Cap Cavalaire, France, photo © Observatoire Marin*



## 6. Conclusion

Through a **participative approach**, a mix of twelve local and regional authorities, research institutes together with an NGO and independent consultancy bureaus have selected and tested a methodological approach, an innovative set of indicators and a scoring methodology which allows the movement towards or away from sustainability to be measured. The novel approach has been to apply a **checklist to measure Governance** and the combined use of **Core** and **Optional** indicators which take into account local specificities.

Data collected for the indicators can be fed into the DeCyDe-for-Sustainability tool which will produce a score and allow an authority to

compare, in the future, whether it is moving towards its strategic policy goals set for achieving sustainability. It also allows predictions to be made to determine how different policy options will affect this progress towards a more sustainable future.

The **Methodological Approach**, **SUSTAIN Indicator Set** and **DeCyDe-for-Sustainability tool** together constitute a **friendly-to-use** rapid implementation, **self-assessment tool**. The tool respects the time limitations of policy-makers and other stakeholders. It is also highly sensitive and robust in assessing different options and impacts of decisions while allowing for flexibility and adaptive management.



*Torre di Cerrano, Teramo, Italy, photo Tamara Ristić*

# The SUSTAIN Indicator Set

## ANNEX 1: GOVERNANCE

*'TO PROVIDE CONSISTENT MANAGEMENT, COHESIVE POLICIES, GUIDANCE, PROCESSES AND DECISIONS FOR THE WISE USE OF THE COAST'*

| ISSUE                                    | QUESTIONS |   | Y | N | DK |
|--|-----------|---|---|---|----|
| Policies / strategies for sustainability | 1         | A sustainable development strategy which includes specific references to the coast and adjacent marine is in place?   |   |   |    |
|  | 2         | There is effective political support for the sustainability process?  |   |   |    |
|  | 3         | There are integrated, sustainability development plans?   |   |   |    |
|  | 4         | The SUSTAIN Issues are covered by relevant policies at the local/regional level?  |   |   |    |
|  | 5         | The SUSTAIN Issues are covered by relevant legal instruments at the local/regional level?   |   |   |    |
|  | 6         | Guidelines have been produced by national, regional or local governments which advise planning authorities on appropriate sustainable uses of the coastal zone? |   |   |    |
|  | 7         | Strategic Environmental Assessments are used to regularly examine policies, strategies and plans for integration of sustainable activities?                     |   |   |    |
| Monitoring tools for sustainability      | 8         | Sustainability targets have been set?   |   |   |    |
|  | 9         | The sustainability targets are regularly reviewed?  |   |   |    |
|  | 10        | There is regular monitoring of the coastal area with respect to the sustainability issues?  |   |   |    |
|  | 11        | A report on the State of the Coast has been written with the intention of repeating the exercise every five or ten years?                                       |   |   |    |
|  | 12        | Reviewing and evaluating progress in implementing sustainability criteria is regularly conducted?   |   |   |    |
|  | 13        | Assessment of sustainability issues shows a demonstrable trend towards a more sustainable use of coastal and marine resources?                                  |   |   |    |

# The SUSTAIN Indicator Set

## ANNEX 1: GOVERNANCE

*'TO PROVIDE CONSISTENT MANAGEMENT, COHESIVE POLICIES, GUIDANCE, PROCESSES AND DECISIONS FOR THE WISE USE OF THE COAST'*

| ISSUE   | QUESTIONS |  | Y | N | DK |
|---|-----------|--|---|---|----|
| Human resources capacity building             | 14        | Local/regional administrations have adequate capacity of staff to deal with sustainability matters?              |   |   |    |
|   | 15        | Local/regional administrations have adequate expertise available to deal with sustainability matters?            |   |   |    |
|   | 16        | Staff is trained on coastal sustainability matters?  |   |   |    |
|   | 17        | All the relevant administrative levels and departments are collectively working on sustainability matters?       |   |   |    |
| Implementation of good management practices   | 18        | There is an identifiable point of contact for coastal sustainability matters?                                    |   |   |    |
|   | 19        | Existing instruments are being adapted to deal with sustainability management matters                            |   |   |    |
|   | 20        | A long-term financial commitment is in place for undertaking initiatives which aim towards sustainability?       |   |   |    |
|   | 21        | Integrated programmes on the coast are being carried out that improve the sustainability of the area?            |   |   |    |
| Stakeholder involvement/ public participation | 22        | All stakeholders involved in sustainability performance have been identified and are both informed and involved? |   |   |    |
|   | 23        | Partnerships have been established between local authorities and communities for sustainability matters?         |   |   |    |
|   | 24        | There is a public participation process involving all necessary stakeholders, including business?                |   |   |    |

(Y = Yes; N = No; DK = Do not know)



# The SUSTAIN Indicator Set

## ANNEX 2: ECONOMICS

*'TO PROMOTE AND SUPPORT A VIGOROUS AND SUSTAINABLE COASTAL ECONOMY'*

### ISSUE: Economic Opportunity

#### CORE INDICATORS

- |   |   |
|---|---|
| <b>1 Employment by sector</b>   | <p><u>Description:</u> Percentage of the overall employed workforce by sector (e.g. % employed in fishing and agriculture, % employed in manufacturing)</p> <p><u>Units:</u> %</p>  |
| <b>2 Unemployment rate</b>  | <p><u>Description:</u> The unemployment rate is defined as the number of unemployed persons as a percentage of the total labour force. NB Not all people out of work are classified as unemployed. Those who have not actively sought work in the last four weeks and/or are not available to start work in the next two weeks are classified as economically inactive, rather than unemployed, in accordance with International Labour Organisation guidelines.</p> <p><u>Units:</u> %</p> |
| <b>3 Gross Value Added (per sector of economy, explicitly focusing on coastal dependent activities like fishing, aquaculture, tourism, port activities)</b> | <p><u>Description:</u> Gross value added (GVA) is defined as the value of all newly generated goods and services less the value of the cost of the raw materials and other goods and services that are used up by production.</p> <p><u>Units:</u> % Monetary unit / Sector activity</p>  |

#### OPTIONAL INDICATOR

- |  |  |
|--|--|
| Expenditures and Investments in coastal management | <p><u>Description:</u> This indicates what resources are being committed in order to manage the coast in an integrated way rather than taking each service separately.</p> <p><u>Units:</u> % of monetary units ((€, £, ...)) dedicated to an integrated management approach</p> |
|--|--|

### ISSUE: Land Use

#### CORE INDICATOR

- |   |  |
|---|--|
| <b>4 People and assets at risk in coastal areas</b> | <p><u>Description:</u> People and assets at high risk from coastal flooding or erosion. Flooding can be caused by storm surges, river or sea flooding or a combination of all these.</p> |
|---|--|

# The SUSTAIN Indicator Set

## ANNEX 2: ECONOMICS

*'TO PROMOTE AND SUPPORT A VIGOROUS AND SUSTAINABLE COASTAL ECONOMY'*

Units: % of coastal areas at risk according to the Flood Directive

### OPTIONAL INDICATOR

2 Re-use of urban and derelict land

Description: This indicates the percentage of previously used land redeveloped in a year.

Units: %

### ISSUE: Tourism

### CORE INDICATORS

5 Tourism Intensity

Description: A measure of tourism pressure mainly upon social and environmental systems. There are thresholds for this index in terms of sustainability set out in the EU's Environment and Tourism in the Context of Sustainable Development, DGXI-EC (1993).

Units: No. of tourist / resident population/ year

6 Beaches with eco-label awards

Description: Awards that show the number of beaches designated as bathing areas which achieved good environmental quality

Units: absolute number of certifications; % of beaches with eco-label

7 Recreational boating

Description: The number of berths and moorings for recreational boating gives an indication of the pressure upon the coastal system.

Units: No. of berths and moorings where codes of practice (discharges, recycling, boat maintenance) are provided.

### OPTIONAL INDICATORS

Bed occupancy rate

Description: Proportion of available tourist beds that are occupied over a year.

Units: %

Seasonal homes

Description: Homes that are occupied only part of the year and are not the occupant's primary residence.

Units: %

# The SUSTAIN Indicator Set

## ANNEX 2: ECONOMICS

*'TO PROMOTE AND SUPPORT A VIGOROUS AND SUSTAINABLE COASTAL ECONOMY'*

### ISSUE: Transportation

#### CORE INDICATORS

##### 8 Transport usage

Description: This indicator is defined as the share of use of each mode of transport as a percentage of the use of total transport. In some countries this may be expressed in passenger-kilometres, in others it may be the number of people using different transport modes for specific purposes like travelling to work.

Units: % passenger Km using other than private car

##### 9 Transport of Goods

Description: The quantity of goods and people passing through the port annually

Units: % of goods transported through ports and by train.

#### OPTIONAL INDICATORS

##### Vehicle ownership

Description: Car ownership per capita.

Units: %

##### Degree of accessibility in island territories

Description: Availability of transport to move freely between islands and between islands and the mainland.

Units: No. of transportation means and %

### ISSUE: Economic Performance

#### OPTIONAL INDICATOR

##### Businesses with access to broadband

Description: Percentage of business with access to broadband.

Units: %



# The SUSTAIN Indicator Set

## ANNEX 2: ECONOMICS

*'TO PROMOTE AND SUPPORT A VIGOROUS AND SUSTAINABLE COASTAL ECONOMY'*

### ISSUE: Energy & Climate Change

#### OPTIONAL INDICATOR

Share of Biofuels in Transport

Description: Amount of biofuels used as a percentage of total fuel consumed.

Units: %

### ISSUE: Fisheries & Aquaculture

#### OPTIONAL INDICATOR

Aquaculture and Fisheries production

Description: Commercial production of aquatic organisms (fish, molluscs, crustacean, aquatic plants) in coastal waters.

Units: % of vessels using TACs and quotas, set under specific scientific and conservation criteria , taking into account safe biological limits of the specific

# The SUSTAIN Indicator Set

## ANNEX 3: ENVIRONMENTAL QUALITY

*'TO MAKE AVAILABLE AND PROMOTE SUSTAINABLE ENVIRONMENTAL PRACTICES'*

### ISSUE: Air Pollution

#### CORE INDICATOR

- |   |   |
|---|---|
| <b>1 Air quality</b> (according to 2008/50/EC, Annex 2) | <p><u>Description:</u> Number of times limit values are exceeded for Particulate Matter (PM10), Nitrogen dioxide (NO2), Ozone (O3), Sulphur dioxide (SO2) (source: European Environment Agency website, data and indicators <a href="http://www.eea.europa.eu">http://www.eea.europa.eu</a>)</p> <p><u>Units:</u> no. of times limits are exceeded (PM10; NO2; O3; SO2)</p> |
|---|---|

### ISSUE: Biodiversity and Natural Resources Management

#### CORE INDICATORS

- |  |  |
|--|--|
| <b>2 Change of condition of coastal and marine habitats and species that have been identified as priorities for conservation</b> | <p><u>Description:</u> Status and trends of biodiversity and habitats loss. Main objective identified by the EU with relation to biodiversity.</p> <p><u>Units:</u> Number of (A) habitats and (B) species lost since the approval EU Habitats and Birds Directives. The year of approval of each Directive will be the baseline year for those species and habitats listed.</p> |
| <b>3 Area of land and sea protected by statutory designations</b>  | <p><u>Description:</u> Area protected for nature conservation, landscape or heritage. Includes marine protected area (if within local / regional authority jurisdiction)</p> <p><u>Units:</u> Hectares as a percentage of the land area of the municipality</p>  |

#### OPTIONAL INDICATORS

- |  |  |
|--|--|
| Fish passage   | <p><u>Description:</u> Coastal rivers which allow passage of migratory fish to / from spawning grounds</p> <p><u>Units:</u> Number or % of coastal rivers which allow passage of migratory fish to / from spawning grounds</p> |
| Terrestrial coastal / marine endangered / endemic species with management plan | <p><u>Description:</u> Existence of management plans for coastal and marine endangered / endemic species.</p> <p><u>Units:</u> Number or % of species</p>  |

# The SUSTAIN Indicator Set

## ANNEX 3: ENVIRONMENTAL QUALITY

*'TO MAKE AVAILABLE AND PROMOTE SUSTAINABLE ENVIRONMENTAL PRACTICES'*

Invasive species

Description: Extent to which invasive fauna and flora are present within coastal and marine ecosystems

Units: checklist of sightings / present; presence of top ten unwanted per region within each jurisdiction

### ISSUE: Change at the Coast

#### CORE INDICATORS

4 Coastal erosion

Description: Evolution of the shoreline over time.

Units: % of total shoreline that is eroded

5 Length of artificially defended coastline

Description: Measured by the existence of hard coastal defence works along the coast (seawalls, dykes, breakwaters, groynes or other hard structures)

Units: % of coastline that has hard coastal defences

### ISSUE: Energy & Climate Change

#### CORE INDICATORS

6 Energy consumption

Description: Measured per capita and per sector. Based on Eurostat Statistics for the consumption of all EU (27) Member States.

Units: Tonnes of oil equivalent (TOE)/ capita

7 Greenhouse gas emissions

Description: Based on the EU report giving mean annual emissions of GHG in the EU in 2008 of around 10 tonnes of CO<sub>2</sub>-equivalent per person.

Units: tonnes CO<sub>2</sub> equivalent /capital

8 Share of renewable energies

Description: Share of renewables in total inland energy consumption.

Units: % of overall energy use from renewable resources.



# The SUSTAIN Indicator Set

## ANNEX 3: ENVIRONMENTAL QUALITY

*'TO MAKE AVAILABLE AND PROMOTE SUSTAINABLE ENVIRONMENTAL PRACTICES'*

### ISSUE: Energy & Climate Change

#### OPTIONAL INDICATOR

Green buildings (%)

Description: Percentage of buildings conforming to strict environmental standards.

Units: %

### ISSUE: Land Use

#### CORE INDICATORS

**9** Area of built-up land

Description: This indicates the degree of pressure on the coast arising from urban development and infrastructure construction. A major data source with harmonized data at European level is the Corine Land Cover (which classifies this type of land use as “Artificialized areas”).

Units: % artificialized areas

#### OPTIONAL INDICATORS

Land take by intensive agriculture (Proportion of agricultural land farmed intensively)

Description: The proportion of agricultural land which is being managed under intensive systems. It is an aggregation of all pressures on biodiversity resulting from intensive agricultural practices.

Units: % of agricultural land farmed intensively

Public ownership of coastal zones

Description: this describes the percentage of publicly owned land in coastal zones.

Units: %

Forested land area

Description: The proportion of land area under natural or planted stands of trees of at least 5 metres in situ, whether productive or not (excludes tree stands in agricultural production systems for example, in fruit plantations and agroforestry systems and trees in urban parks and gardens).

Units: %

# The SUSTAIN Indicator Set

## ANNEX 3: ENVIRONMENTAL QUALITY

*'TO MAKE AVAILABLE AND PROMOTE SUSTAINABLE ENVIRONMENTAL PRACTICES'*

### ISSUE: Public Health and Safety

|  |   |
|--|---|
| <b>10 Human exposure to harmful noise levels</b> | <p><u>Description:</u> Percentage of population exposed to noise levels that exceed the thresholds set out in Directive 2002/49/EC.</p> <p><u>Units:</u> % population exposure over 50 dB according to Directive 2002/49/EC, Annex V.</p> |
|--|---|

### ISSUE: Waste Management

#### CORE INDICATORS

|  |  |
|--|--|
| <b>11 Waste production and disposal method</b> | <p><u>Description:</u> This includes the production of waste /capita and quantities of waste generated segregated by disposal method -landfill, recycling, up cycling, incineration, composting...</p> <p><u>Units:</u> kg / capita/ year ; % landfill; % recycling; % incineration; % compost</p> |
| <b>12 Amount of beach litter</b>               | <p><u>Description:</u> Measured by the amount of litter collected on the beach</p> <p><u>Units:</u> % change of tons of litter collected per km of coastline cleaned since the baseline year.</p>  |

### ISSUE: Water Resources and Pollution

#### CORE INDICATORS

|  |  |
|--|--|
| <b>13 Quality of bathing water</b>                           | <p><u>Description:</u> Proportion of total coastal bathing waters classified as “Poor quality”, “Sufficient quality”, “Good quality”, or “Excellent quality” according to the European Bathing Water Directive (Directive 2006/7/EC of The European Parliament and of The Council)</p> <p><u>Units:</u> % of bathing waters classified as good or very good status</p> |
| <b>14 Wastewater treatment</b>                               | <p><u>Description:</u> Proportion of wastewater that is treated, in order to reduce pollutants before being discharged to the environment, by level of treatment (primary, secondary or tertiary) (UN, 2007).</p> <p><u>Units:</u> % population served with wastewater systems</p>   |
| <b>15 Chemical status of transitional and coastal waters</b> | <p><u>Description:</u> Environmental quality standards are established in Article 3.2 of Directive 2008/105/EC Of The European Parliament And Of The Council.</p> <p><u>Units:</u> % of water bodies classified with good or very good chemical status.</p>  |

# The SUSTAIN Indicator Set

## ANNEX 3: ENVIRONMENTAL QUALITY

*'TO MAKE AVAILABLE AND PROMOTE SUSTAINABLE ENVIRONMENTAL PRACTICES'*

|   |   |
|---|---|
| 16 Ecological status of transitional and coastal waters | <p><u>Description:</u> According to Directive 2000/60/CE (Water Framework Directive).</p> <p><u>Units:</u> % of water bodies classified as good or very good status</p>                             |
| 17 Hydrocarbon spills                                   | <p><u>Description:</u> The length of coastline vulnerable to impacts of hydrocarbon pollution incidents</p> <p><u>Units:</u> % of coastline affected by major/minor spills in the previous year</p> |

## ISSUE: Water Resources and Pollution

### OPTIONAL INDICATORS

|  |   |
|--|---|
| Annual water consumption (measured per capita)                   | <p><u>Description:</u> The gross amount of water extracted from any source, either permanently or temporarily, for a given use. Measured in million cubic metres. Per capita consumption is then calculated using national population data</p> <p><u>Units:</u> Annual Cubic metres consumed per capita</p> |
| Collection of rain water/ rain water harvesting for urban supply | <p><u>Description:</u> The collection and storage of rainwater for future use.</p> <p><u>Units:</u> Cubic metres / litres</p>   |
| Quality of coastal rivers  | <p><u>Description:</u> Water quality reflects the amount of pollutant present within water bodies, and can provide information on the relationship between human activity and pollution sources.</p> <p><u>Units:</u> Total number of designated river waters, disaggregated by classification, or %</p>    |
| Quality of water for human consumption                           | <p><u>Description:</u> Council Directive 98/83/EC on the quality of water intended for human consumption</p> <p><u>Units:</u> %</p>   |
| Wastewater reused  | <p><u>Description:</u> Treated wastewater that is used. For example, industrial cooling and irrigation in agriculture</p> <p><u>Units:</u> %</p>  |



# The SUSTAIN Indicator Set

## ANNEX 3: ENVIRONMENTAL QUALITY

*'TO MAKE AVAILABLE AND PROMOTE SUSTAINABLE ENVIRONMENTAL PRACTICES'*

Saline intrusion into groundwater

Description: The gross amount of saltwater that is drawn-in from the sea into freshwater aquifers

Units:

Canalisation of waterways

Description: The length of artificial segment/total length

Units: %

## ISSUE: Fisheries & Aquaculture

### OPTIONAL INDICATOR

Fish catches of species taken from stocks outside safe biological limits

Description: This indicator shows the percentage of fish caught in EU-managed waters that are taken from stocks that have been assessed to be outside safe biological limits by the International Council for the Exploration of the Sea.

# The SUSTAIN Indicator Set

## ANNEX 4: SOCIAL WELL-BEING

*'TO PROMOTE SOCIAL UNITY AND DURABILITY'*

### ISSUE: Demography

#### CORE INDICATOR

##### 1 Demographic dependency

Description: The demographic dependency ratio is the number of children (0-14 years old) and older persons (65 years or over) in relation to the working-age population (15-64 years old) (UN, 2007).

Units: %

### ISSUE: Equity

#### CORE INDICATOR

##### 2 Poverty

Description: Population at risk of poverty

Units: % of population at risk of poverty

#### OPTIONAL INDICATORS

Actions for the promotion of equal opportunities and social inclusion

Description: This may describe actions that are in place and can be included, such as the provision of an advice bureau, monitoring schemes and awareness raising campaigns.

Units: % of people covered by actions

Degree of women participation in decision-making positions

Description: Number of women involved in decision-making positions as a percentage of all decision-making positions.

Units: % of positions

Unemployment of disabled people

Description: Percentage of the disabled working age population not in work.

Units: %

# The SUSTAIN Indicator Set

## ANNEX 4: SOCIAL WELL-BEING

*'TO PROMOTE SOCIAL UNITY AND DURABILITY'*

### ISSUE: Education & Training

#### CORE INDICATOR

#### 3 Educational attainment of the population

Description: Proportion of the population of working age (15-64 years) that has gained post-school leaving age educational qualifications.

Units: % of the population that has gained post-school leaving age educational qualifications

#### OPTIONAL INDICATOR

#### Literacy

Description: Literacy rate is measured as the proportion of the adult population aged 15 years and over that is literate (UN, 2007).

Units: %

### ISSUE: Local and Cultural Identity

#### CORE INDICATORS

#### 4 Visits to cultural and natural sites

Description: Number of visitors to cultural and natural sites per annum.

Units: No. of visitors per annum

#### 5 Attendance to festivals and public events, organised to strengthen the area's local identity

Description: Attendance levels per annum per capita at public events designed to celebrate natural values, local culture and local identity and organised by or with the participation of the local authority under assessment. Examples of events that can be considered: exhibitions, music concerts, theatre performances on themes related to local identity (cultural, natural).

Units: No. of attendees per annum per capita at referred events



# The SUSTAIN Indicator Set

## ANNEX 4: SOCIAL WELL-BEING

*'TO PROMOTE SOCIAL UNITY AND DURABILITY'*

### OPTIONAL INDICATORS

Cultural heritage actions supported (includes rural heritage)

Description: Number of relevant cultural projects the local authority or municipality is involved with (staff time or funding) each year.

Units: %

Local products

Description: Locally determined method for measuring availability of local produce to local consumers in a year. This might be a measure of direct numbers or value or it could be the number of farm markets, or local shops or businesses such as hotels and restaurants using locally sourced produce.

Units: % of the consumption of goods that are locally produced

### ISSUE: Public Health and Safety

#### CORE INDICATORS

**6** Provision of health care services

Description: Health care service provision (by type) per capita (per head of population), within a certain distance or travelling time. The service provision includes doctors' surgeries, dentist surgeries, hospitals and long term care services for those with special needs or the chronically ill. The relevant measure of distance or travel time should be determined locally.

Units: % inhabitants within 10 km or 30 minutes of a hospital.

**7** Crime

Description: Crime rate measured as the number of crimes per 1000 population by type of crime (Source to be consulted: EUROSTAT crime definitions).

Units: No. of crimes / 1000 inhabitants

**8** Safety provision

Description: Proportion of designated bathing beaches (Bathing Water Directive) with life guard services provided during the main bathing season.

Units: % of designated bathing beaches with life - guard provision during the bathing season

# The SUSTAIN Indicator Set

## **ANNEX 4: SOCIAL WELL-BEING**

*'TO PROMOTE SOCIAL UNITY AND DURABILITY'*

**ISSUE: Public Health and Safety**

### **OPTIONAL INDICATORS**

Provision of health  
care services

Description: The service provision includes doctors surgeries, dentist surgeries, hospitals and long term care services for those with special needs or the chronically ill.

Units: no. of doctors / 1000 inhabitants

Life expectancy

Description: Average life expectancy by gender.

Units: %

Perception of safety

Description: Percentage of people who feel safe in the local community.

Units: %



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**Samothraki Municipality**  
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