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INDICATORS FOR INTEGRATED COASTAL ZONE MANAGEMENT (ICZM) : *Methodological Factsheets in support of comparable measurements and an integrated assessment in coastal zones*

The **ICZM Protocol for the Mediterranean Sea** (the 'ICZM Protocol'), signed in Madrid on 21 January 2008 and ratified on 24 March 2011, represents a milestone for the implementation of ICZM in the Region and can serve as a blueprint for the implementation of ICZM in other Regional Seas. The **PEGASO project** builds on existing capacities and develops common approaches to support integrated policies for the Mediterranean and Black Sea Basins in ways that are consistent with the ICZM Protocol.

The PEGASO project has developed **a core set of indicators** that are instrumental in measuring the implementation of ICZM policies and programmes. The core set of ICZM indicators addresses the specific requirement of Article 27 of the Protocol to '*define coastal management indicators*' and '*establish and maintain up-to-date assessments of the use and management of coastal zones*'. In doing so, the PEGASO project has widely built on previous and existing indicator sets developed by different institutions and projects, and which are duly acknowledged (see '[Methodological paper for the selection and application of PEGASO ICZM indicators](#)' for further reading and background material)

The present Methodological Factsheet is part of a set of 15 factsheets that are made available to end-users. This set of factsheets is conceived to support a harmonized approach to calculate ICZM indicators at different spatial scales in the Mediterranean and Black Sea regions.

Name of the Indicator

Economic Production per Sector (Turnover)

Objective of the indicator

The Protocol states that priority should be given to “public services and activities requiring the proximity to the sea”. Economic activities are impacting the environment through resources consumption, pollution (both diffuse and from point sources), land use etc. But economic activities can also contribute to the social and economic development of a coastal zone by providing job and wealth creation. Thus it is important to elucidate to what extent each economic activity, taking place within the coastal zone, really contributes to the whole coastal economy. This will provide more insight in the dependence of the regional economy on the sea.

The indicator is a description of the relative importance of one sector of the coastal economy relative to another sector (generally in comparison to their relative importance to the total economy of the management area). It describes the activity level within the coastal zone. Thus, it can be used as a proxy of pressure on coastal/marine resources to generate this turnover.

It is important to use this indicator together with the 3 other economic indicators (Pattern of Sectorial employment, Number of enterprises and Added value per sector). See the section on “Example of integrated assessment”.

Policy context

ICZM Policy Objective	To give priority to public services and activities requiring the proximity to the sea, and to take into account the specific characteristics of the coastal zones when deciding about coastal uses
ICZM Protocol Article	Article 9: <i>Economic activities (9.1e)</i>
UNEP-MAP Ecological Objective	No reference to the UNEP-MAP Ecological Objective
INSPIRE ANNEX I-III Data Theme (34)	Annex III 8- Production and Industrial Facilities (Annex III – 8)

CALCULATION OF THE INDICATOR

Spatial consideration

Coverage	Resolution
Coastal zone of the Mediterranean Sea Coastal zone of the Black Sea	<ul style="list-style-type: none"> Coastal zone of the Mediterranean and Black Seas at NUTS2 level Coastal zone of the Mediterranean and Black Seas at NUTS3 level EEZ of countries in the Mediterranean and Black Seas <p>Note: the spatial reporting unit, or scale, may be defined by the issue or sector under consideration (see below)</p>

Temporal consideration

Period	Resolution (time interval or unit)
Time series should be as long as possible	Annual data. Measurements should be consistent in reflecting the situation for comparable reference points i.e. 1st of January or 31st of December every year.
Select a baseline, followed by reference points e.g. 2012, 2007, 2002 ...	

Note: the idea is to have time series as long as possible but also to have reference points every 5 years to catch trends. For seasonal activities, such as tourism, it is important to have monthly data for the most recent years.

Parameter(s)

Note:

- 1) The calculation method is given for NUTS3 level. It should be repeated for NUTS2 level.
- 2) For each parameter, the economic activities or sectors considered are the following:

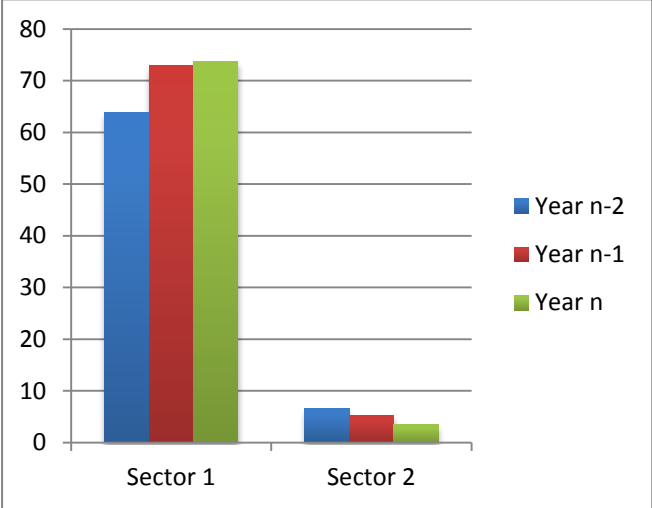
Turnover per sector at national, regional and local level (billions/millions Euro) for the following sectors (if relevant for the area under consideration!)

- Submarine cables
- Shipbuilding and repair, scraping...
- Extraction (marine aggregates)
- Recreational Activities (Expenditures instead of turnover)
 - Bathing
 - Yachting and Sport
 - Recreational fisheries (including shellfish)
- Offshore oil and gas-related industry
- Electricity power production interacting with marine environment (Marine renewable energy, Nuclear plants...)
- Living resources based activities
 - Aquaculture
 - Professional Fisheries (including algae)
 - Seafood processing and marketing
- Maritime financial services (insurance, banks, supports...)
- Transport activity
 - Harbours and supports
 - Transport (people and goods)
- Maritime civil engineering (harbours, dams, dikes...)
- Other sectors and activities depending on or impacting coastal and marine environment (Agro industry, Food Processing, Chemistry...)
 - Agriculture
 - Other industries
 - Urban sprawl
 - Coastal tourism (hotels, camping, restaurants, cafes)

- (i) Turnover per sector, for sectors that are relevant in relation to the ICZM issue
 Note: 'relevant' sectors are to be identified and selected according to a causal chain analysis (impacting sectors and impacted sectors). The turnover (billion of Euros) is defined at the scale of a reporting unit which is relevant for the issue or sector under consideration: e.g. river basin, coastal NUTS5/LAU2 etc.
- (ii) If data at regional and local level are not available, the payroll employment (%) in each sector is to be used as an allocation key: multiplier average Turnover/employment for sector i

Calculation method

Steps		Products			
1	For each geographical scale, use the latest time series to identify the contribution of each sector and marine/coastal economy to the local/regional economy. Compare impacting and impacted sectors.	Build the following table comparing national to regional and local turnover:			
		Sector	Local Turnover	Regional Turnover	National Turnover
		Sector n°1(S ₁)			

	<p>Calculate of the relative weight of each sector to the global turnover: Sector turnover / global turnover * 100</p>	<table border="1" data-bbox="735 286 1316 517"> <tr> <td>Sector n°2(S₂)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>...</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td>100%</td> <td></td> <td>100%</td> </tr> <tr> <td>Total (billion Euros)</td> <td></td> <td></td> <td></td> </tr> </table> <p>A table comparing national turnover to local turnover can be made (if data are available in national database)</p>	Sector n°2(S ₂)				...				Total	100%		100%	Total (billion Euros)			
Sector n°2(S ₂)																		
...																		
Total	100%		100%															
Total (billion Euros)																		
2	<p>For each time series available, establish a bar chart (one for regional scale and one for local scale) comparing Turnover for different sectors at different time scale. Bar charts can also be built for each sector and for the most recent time series to compare different areas (communes, sub-river basins...).</p>	<p>Bar chart comparing turnover (billion Euro) per sector at different time scale</p>  <table border="1" data-bbox="735 683 1390 1189"> <caption>Bar Chart Data: Turnover (billion Euro) per sector at different time scale</caption> <thead> <tr> <th>Sector</th> <th>Year n-2</th> <th>Year n-1</th> <th>Year n</th> </tr> </thead> <tbody> <tr> <td>Sector 1</td> <td>65</td> <td>75</td> <td>75</td> </tr> <tr> <td>Sector 2</td> <td>8</td> <td>5</td> <td>3</td> </tr> </tbody> </table>	Sector	Year n-2	Year n-1	Year n	Sector 1	65	75	75	Sector 2	8	5	3				
Sector	Year n-2	Year n-1	Year n															
Sector 1	65	75	75															
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3	<p>If regional and local data are not available, the payroll employment (%) in each sector can be used as an allocation key. Example of calculation: S_{1E}% is the share of sector S₁ in regional payroll employment</p>	<p>Allocation Key (in percentage) for each sector at regional scale</p>																
4	<p>These keys (per sector) should be applied to the national turnover (per sector) to give regional value. Example of calculation: S_{1T} is the turnover of Sector 1(in billion Euros) at national level. Calculation of sector turnover at regional scale: S_{1T} * S_{1E}%</p>	<p>Regional (and/or local) turnover per sector (allowing the building of table and bar chart of step 1 and 2)</p>																
5	<p>For a Regional Assessment under transboundary constraints, the Turnover is not relevant and should be replaced by the Gross Domestic Product (GDP). GDP is mainly available at national scale and not at local scale or for the coastal zone.</p>	<p>Derive the GDP per capita at the national scale and calculate the GDP for the coastal population per country and Mediterranean or Black Sea coast. Aggregate GDP for coastal population at the scale of the Mediterranean or Black Sea.</p>																

Current monitoring		Data sources
		National Database, Multipliers from surveys or National Accounts
Assessment context		
Use of the indicator in previous assessments/initiatives	The Balearic Indicators Project includes this indicator in its socio-economic indicators however, no factsheet, technical support or database are available yet.	
DPSIR framework	Driving forces	
Link to anthropogenic pressure	A high turnover, used as a proxy of pressure over the resources, indicates a high anthropogenic pressure on natural resources and ecosystems.	
Sustainability target or threshold	This indicator has to be read according to other economic indicator.	
Link with other assessment tools		
Example of integrated assessment	<p>To get a full overview of the economic activity within the coastal zone. It is necessary to use this indicator together with the 3 other economic indicators.</p> <p>The ratio turnover/employment allows the comparison between different sectors regarding their actual contribution to the local economy.</p> <p>A high number of hypoxia events can be related to intensive agriculture within the coastal area</p>	
Scope for future improvements		
Field surveys can be conducted to get a better estimation (when data are not available).		
Indicator references (i.e. UNEP, EEA, ...)		

Note: factsheet content drawn by the PEGASO partner University of Brest.