

Terms of References
for the Pilot project in the Adriatic on testing the candidate common indicator
‘Land use change’ in the Mediterranean

within the EcAp framework/EcAp-MED project

(listing specific activities, services carried out for the project implementation, as well as policy context and objectives)

Background

The Ecosystem Approach (**EcAp**), is the overarching principle of UNEP-MAP/Barcelona Convention, to be integrated in all of its policies and activities.

As most relevant milestone in the implementation of EcAp, at of the 18th Ordinary Meeting of the Contracting Parties (**COP18**, 2013), Decision IG.21/3 on the “Ecosystem Approach including adapting definitions of Good Environmental Status (GES) and targets” expresses the agreement on regionally common targets, lists of indicators to achieve GES in the Mediterranean, and integrated list of Mediterranean GES, targets and indicators.

An EcAp roadmap was also agreed as part of this decision on how to achieve an integrated monitoring and assessment programme by the next meeting of the Contracting Parties, which for the first time would ensure a common basis of assessment for the Mediterranean marine and coastal environment.

As part of this EcAp roadmap, expert level monitoring discussions took place in the various Correspondence Groups on Monitoring (**CORMONs**), including on Coast and Hydrography.

The CORMON Coast and Hydrography took place in May 2013 and agreed on one common indicator and one candidate common indicator for the Mediterranean region, noting that the usage of the candidate common indicator, which is related to land use change, would need further testing, before the Contracting Parties can agree to its regional usage as a common indicator.

The current EcAp Pilot project, in the overall framework of an EU funded project on the “Implementation of the Ecosystem Approach in the Mediterranean by the Contracting parties in the context of the Barcelona Convention for the Protection of the Marine Environment and the Coastal region of the Mediterranean and its Protocols (**EcAp-MED project 2012-2015**), aims, following up on the CORMON outcomes, to test the applicability of the land-use change candidate common indicator, though a sub-regional pilot.

Changes of land use have a direct implication for the ecosystems, habitats and species in coastal zones as they cover both terrestrial and marine aspects. By changing the land uses, mainly from 'more natural' to 'more manmade', the integrity and diversity of coastal ecosystems and landscapes is adversely affected or even lost.

By definition, the indicator ‘change of land use’ can be described as the extent, and type, of land use that directly affects wildlife habitat and, thereby, impacts local and global biodiversity. Human alteration of landscapes from natural vegetation to any other use typically results in habitat loss, degradation, and fragmentation, all of which can have devastating effects on biodiversity. Land conversion is the single greatest cause of ecosystem and habitat fragmentation, loss or even extinction of species. http://en.wikipedia.org/wiki/Land_use,_land-use_change_and_forestry - cite_note-Bierregaard-6. Of particular concern is urban sprawl in coastal areas, where the natural areas, habitats, agricultural or forestry areas are converted to built-up areas. The process is known as littoralisation and means the change in the way land is used (e.g. clearing of forests for agricultural use, change from agricultural land to urban use). Land take by the expansion of residential areas, tourism development, and construction sites is the main cause of the increase in the coverage of urban land at the Mediterranean coastal level. Agricultural zones and, to a lesser extent, forests and semi-natural and natural areas, are disappearing in favour of the development of artificial surfaces. This affects biodiversity since it decreases habitats, the living space of a number of species, and fragments the landscapes that support and connect them.

The ICZM Protocol requires the ecosystem approach and a balanced allocation of uses to avoid urban sprawl (Articles 5 and 6). The limitation of the linear extension of urban development, including transport infrastructure along the coast (Article 8), is one of the major objectives and principles of this legal instrument. Regular reporting on the state and evolution of coastal zones (Article 16), on the basis of appropriate indicators (Article 18), is also required. To comply with these requirements, to allow for the assessment and to consequently propose policies to better manage coastal areas, it is crucial to implement the common indicator on change of land use which embraces many concepts, such as land take, calculating the percentage of built up areas and understanding the trends in the evolution of urban areas. Detection of urban sprawl area and the continuation of linear development of urban areas along the coast, as well as fragmentation of coastal habitats or change of landscape types, can also be considered. Moreover, the sets of data needed for the land use change can be used also for two other indicators, the later two mentioned above in particular.

The land use change indicator aims to monitor progress towards achieving the first goal for coastal sustainability, as set out in the ICZM Protocol. The indicator has one measurement – calculation of the percentage of built-up space on land and at sea. The aim is to allow the evaluation of the trends in urban areas so to avoid urban sprawl and limit linear extension of urban development, including transport infrastructure, along the coast. The objective is to acquire the information about the extent to which the coastal zone has been built-up over the past several years because this will indicate the degree of pressure on the coast and the likelihood of further changes in the future. The information on whether development on the coast has been greater and more intense than in the wider region, and the trends in the developments making use of marine waters, is also important. Such data can also help to understand patterns of development and unravel cause-effect relationships, especially between activities and the overall impact on achieving Good Environmental Status (GES).

It is evident that this indicator on land use change has a relatively higher weight in comparison to any other indicators which are 'one issue' oriented and should, therefore, deserve to be considered for the re-introduction to the list of common indicators. Data availability and coverage of the whole Mediterranean with the required data was the major obstacle, which prevented this indicator being included in the latest decision of the Contracting parties in Istanbul (December 2013). On the contrary, some major EU funded projects (such as Pegaso, Medina) have made a great progress with this specific indicator as the availability of data has improved, and have produced valuable results that could encourage the CORMON Coast and Hydro meeting to reconsider the importance of this indicator, bringing it to the common list of EcAp indicators.

Taking into account the decision IG 231/3 of the COP 18 (Istanbul, December 2013) on the ecosystems approach including adopting definitions of Good Environmental Status (GES) and targets, and recommendations UNEP(DEPI)/MED395/6 of the Correspondence group on Monitoring Coast and Hydrography meeting (Athens, 28 May 2014), which put the land use change indicator on the list of candidate common indicators, it was agreed that it would be ideal to test this indicator at a sub-regional (Mediterranean) level, before it is decided to be included or not in the initial phase of the Integrated Monitoring and Assessment Programme from 2016 on.

After bilateral consultations, all of the Adriatic countries indicated their interest to participate in such a pilot: "EcAp indicator testing". Results of the project will be presented at the PAP/RAC Focal Points meeting in 2015.

The main recommendation of the COP decision on EcAp monitoring and reporting is to propose methods and monitoring techniques which are not creating additional extensive financial obligations for the countries. Therefore, the purpose of this pilot project is to test this indicator by using remote sensing information that will guarantee a harmonised picture for the whole sub-region. Due to different land use classes, data sources, formats and legends that countries use to present land use, this pilot gives an excellent opportunity to provide a harmonised view of the state of coastal zones. At a later stage of the EcAp process, the way of verifying the results obtained by the countries could be

envisaged so the results can be used for the reporting purposes as well. Alternatively, the effort to harmonise, for example national land use classes and sources of data, would be extremely time consuming and technically very difficult to perform. The pilot project will, therefore, provide a solid starting point, based on a common method, to develop regional and sub-regional policies and measures in order to approach GES.

Non-EU countries will be eligible to get full support from this pilot project. The EU countries, however, will participate on a non-cost basis, which involves activities such as desk work but participation at meetings cannot be covered by the pilot budget. In any case, all the countries will profit from the common method and data sources (satellite images), their processing and the outputs generated by the available technology.

Overall objectives

The major objective of this pilot project is to test the monitoring of the changes of land uses in the Adriatic coastal areas so to test the feasibility of monitoring techniques and its applicability for other Mediterranean sub-regions. The objective is also to test the draft monitoring guidelines for this specific indicator and provide evidence for the usage of the results for meeting the requirements described above.

Specific objectives

The specific objectives include the following:

- Provide a common approach for testing the land use change indicator by using remote sensing data provided by relevant satellite images;
- Test the land use change indicator for the whole Adriatic region;
- Analyse the data acquired and present results on the evolution and development of coastal areas in a given time period;
- Provide inputs for the monitoring guidelines;
- Present possibilities for further use of acquired data, such as for other coastal indicators.

Tasks

1. Desk work
 - Analysis of existing approaches and experiences from projects such as CAMPs, Pegaso, Medina (FP7 EU), countries' experiences and alike and their applicability for the sub-region and potentially for the whole region;
 - Define the geographical scope in cooperation with the involved countries;
 - Define the land use classes to be used in the pilot (taking into account most relevant 16 classes from the 44 Corine land cover classes would be sufficient);
 - Define the scale and detail of the analysis;
 - Define the method for analysis of trends, comparisons between the countries, etc. taking parameters (see below) into account;
 - Propose possible additional uses of the land use results, data acquired (such as for the study of fragmentation of coastal habitats or change of landscape types).
2. Implementation of the analysis by applying appropriate software and technology.
3. Preparation of analysis in light of pilot outcomes, proposals for future work, presentation of results at a half a day meeting dedicated to the pilot on the sidelines of the PAP/RAC Focal Points meeting (13-14 May 2015).
4. Upgrading of the monitoring guidelines prepared by PAP/RAC and presented at the Correspondence group on Monitoring Coast and Hydrography meeting (Athens, 28 May 2014).

Data sources

Satellite images should be at least 100 x 100 m resolution, possibly from CORINE land cover (CLC). Data sources should be available for two different years (2006 and 2000 for example) to allow evaluation the trends, i.e. detect changes. With one year's data we could present the current state only which would not allow for demonstration of 'change'. Should CLC be available for 2012, then a third series of data could, potentially, be included, which will allow a more complex analysis and arguments for the inclusion of the candidate common indicator on the EcAp list of common indicators.

Spatial consideration

Geographical coverage: Coastal zone of the Adriatic Sea which consists of competent coastal units and territorial waters. On the terrestrial part of the coastal zone the administrative (competent coastal units as defined by the ICZM Protocol e.g. municipalities, counties, provinces), and areas of 0-1 km and 0-10 km buffers from the coastline within the coastal zone should be covered. And on the sea side this are the territorial waters. The coverage should be communicated with the involved countries. The administrative structure (map) should be presented to the countries for their confirmation.

Temporal consideration

Ensure baseline and reference measurement with 6 year's difference, e.g. 2000 and 2006 (depending on data availability). Measurements should be consistent in reflecting the situation for comparable reference points in time e.g. 1st of January or 31st of December. The objective is to calculate the changes that occurred from baseline to reference 1 to be able to interpret trends. If another set of data is available in time from CLC (year 2012) this could be used as an additional reference.

Parameters for consideration

- (i) State of land classes for the baseline and reference year.
- (ii) Changes between classes from baseline to reference year.
- (iii) Area (in km²) of built-up land in coastal units as a proportion of the area of built-up land in the wider reference region.
- (iv) Area of built-up space in the territorial waters, or in other relevant marine spatial units.
- (v) Percent of built-up land by distance from the coastline in 0-1 km and 0-10 km buffers units.
- (vi) Percent of built-up land by distance from the coastline in a 100 m buffer zone.
- (vii) Other parameters, as appropriate, to reflect fragmentation of coastal landscapes and habitats, changes of landscape types, characteristics of coastal urban development (e.g. urban sprawl, linear extension along the coast, landscape ecological potential, extension of agricultural land, density of infrastructure, proximity/distance between some uses to the sea).

Outputs and deadlines:

Report including experiences on the land use change indicator, description of the method, definition of the scale and geographical coverage, and proposals for use of the results of the analysis for other EcAp coastal indicators (Task 1: by 1 March 2015);

- a) Maps at Adriatic scale and country level, graphs showing trends in land use change and description of the results (Task 2: by 15 March 2015);
- b) Report to be presented to the Focal Points on the pilot outcomes (Task 3: by 1 April 2015);
- c) Upgraded monitoring guidelines for coastal indicator on Land use change (Task 4: by 30 April 2015).

Criteria for the selection of the contractor:

- Experience with similar activities at similar scales;
- Familiarity with the EcAp process in the frame of the Mediterranean Action Plan;
- Composition and experience of the expert team;
- Availability of data, hardware and software;
- Cost.

Deadline for the submission of the applications is 19 January 2015 to the following e-mail: marko.prem@paprac.org.