

CASE STUDY

Integrated Management PLAN of Calvià's Littoral (PILC)

LOCATION:

Calvià / Majorca / Balearic Islands

TOPIC:

Beach Management in Practice, Beach protection.

TIME PERIOD RUNNING:

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Integrated Coastal Zone Management (ICZM), Water Management.

AUTHOR:

Name: Service of environment of the town hall of Calvià

Organization: Town hall of Calvià

Address: C/ Julià Bujosa Sans, Batle; number 1. Calvià 07184. Majorca.

Telephone: 971139100 / 971130577

Website: <http://www.calvia.com/cat/Pages/Areas/medi/medi.htm>

E-mail address: mediambientcalvia@yahoo.es

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EXECUTIVE SUMMARY

In the past few years Calvià's municipality has suffered a great human pressure, overcoat in the coastal area, that involves an important urbanizing process in the whole coast, the occupation of beaches and coves, and the construction of sports ports, up to playtime navigation, fishing and a whole set of activities that takes the littoral as a physical support.

As Calvià is a marine biodiversity key system, and specially for the habitats linked to the *Posidonia oceanica* meadows, being these degraded by the human activity, Calvià's Town Hall decided to do a sustainable management of the littoral, we understand by sustainable management one that satisfies the current needs without compromising the aptitude of the future generations to satisfy the own ones.

To make possible this littoral sustainable management, Calvià elaborated the Integral Management Plan of Calvià's Littoral (PILC), directed to obtain a sustainable situation of Calvià's littoral.

In this Plan the gathered information about Calvià's Littoral and the environmental and social problems, that in it are produced, because of the human pressure in this area of the municipality. From this information, a series of actions were studied and accomplished directed to the recovery or to the healthy maintenance of the different areas of the littoral that are threatened.

Due to the extension of Calvià's littoral, in this case, the application area diminished to a coastal concrete zone inside the municipality, which was sufficiently representative of the present problems in practically the whole of Calvià's littoral. It is a question of the Santa Ponça area that is the first one of the tourist centre established in Calvià.

AIMS

The Integral Management Plan of Calvià's Littoral is conceived as an integrated program of Calvià's Local Agenda 21, inside the third action line: to preserve the natural marine and terrestrial patrimony, in which there area three initiatives: natural conservation of Calvià's beaches, to recover the quality of the sea in Calvià and to restore the effects of Calvià's principal environmental and landscape impacts.

In a specific form, the PILC five aims are:

- To stop the trends, uses and negotiations that affect negatively in Calvià's coastal area.
- To propose action programs for the rehabilitation and integral management of Calvià's littoral.
- To be a sensitisation instrument for a " culture on the sustainability of the coastal area ".
- To be an experience of participation and conciliation with the public and private fix actors.
- To be an example - conceptual and practical - as the integral management of the littoral in tourist areas.

METHODOLOGY

The PILC takes place in three stages: initial, elaboration and execution. Every stage involves the elaboration of a series of products that will be presented to the means of opinion.

- Initial stage: this stage's principal aim is the establishment of the aims and the basic methodology that has to be followed becoming the Initial Document. This stage concluded satisfactorily in 2001.
- Elaboration Stage: this is the most complex stage and it includes the diagnosis and interpretation of the information, its synthetic interpretation, as well as an advance of actions taken establishment. The majority of the documents took place ending in 2003.
- Execution Stage: it involves the begging of the Action Plans, of Social Sensitisation, Follow-up and Evaluation, once agreed in elections by the population and the government team.

The PILC development is based on the following phases:

- **Littoral definition**: this takes place considering the different thematic and capacity aspects that include the terrestrial and marine zone of a coastal area, and it includes the following steps:

- Capacity delimitation of the studied area and subsystems capacity definition: The delimitation of the maritime - terrestrial area to be studied is based on the consideration of the following criteria:

- To consider the submerged and emerged area, as two parts of a whole functional one in the coastal area.
- Treat the different coastal typologies in a different way depending its of differentiated form, attending to his physical (geomorphology, dynamics, etc.), ecological (alive community types that live here) and humanized (type of urbanization, density, predominant activities, etc.) characteristics. With this object, three basic coast typologies or Capacity Areas (AE) were delimited: sandy coast, rocky coast and islands. Each one of these AE is studied integrating the emerged and plunged part, and it constitutes the smallest section of analysis.

- Thematic Definition (thematic Areas, thematic fields and Integral Warnings). In each of the different AE sections a thematic study is done. From this point of view, the experts selected four Thematic Key Areas (ATCs), each of them subdivided in three Thematic Fields (CTs). At the same time, these CTs were studied due to the selection of up to five Reference Indicators (IR) per field.

The election of each one of the thematic studied levels is based on representation criteria, in the indicators case, repetition criteria.

Thematic Fix Areas (ATC)	Thematic Fields (CT)
Human pressure	Population Activities Planning
Cultural patrimony	Landscape Archaeological patrimony Architectural patrimony
Biodiversity	Habitat Flora Fauna
Physical meathow and dynamics	Geology Geomorphology and dynamics Hydrology

Table 1. Thematic fix areas and thematic fields.

· **Alternative stage definition.** This methodology allows us to compare the current situation with several future options, an optimist and pessimistic, and evaluate the progress of the actions taken throughout time as a result of the application of different politics. Based on this, the PILC contemplates three reference stages: current Situation, Integral Rehabilitation Stage without PILC intervention and Integral Rehabilitation Stage with PILC intervention.

- **General studies elaboration.** The elaboration of these studies has as purpose to compile the information " of base " on Calvià's littoral, so that it could be used by the different study teams.

- **Thematic and Capacity evaluation.** This accomplishing thematic studies in every capacity subsystem. The values obtained for each of the reference indicators placed in a scale of minimum and maximum values (climbing 0-10), in such a way that the values are given in a registered value shape with regard to the ideal value. Like this, the results are comparable among them. The evaluation results are presented in the shape of Thematic Reports by capacity subsystems. Besides, for every indicator a trend is established for the future being based on values previous to the study or on the experts' knowledge.

- **Integrated evaluation: pondering, graphical synthesis and SIG.**

· This is carried out by an information base of the littoral that can be updated regularly. In the PILC it thinks that not all the spatial subsystems, the thematic areas, thematic and warning fields have the same importance. Therefore, in the integrated elaboration of pondering results are established for the Reference Indicators, Thematic Fields and Spatial Subsystems.

· The joint visualization of the information is accomplished with the graphical synthesis, where it is possible to choose the visualization level of the information: for Thematic Areas or for Capacity Subsystems. The information gets a five-colour code is assigned to facilitate its comprehension. The same graphical synthesis is applied on the future stages.

· The obtained information is represented in a Geographical Information System (SIG) so that a synthetic vision of the littoral is facilitated, beside allowing the publication of the information in a simple way.

- **Projection of Alternative Stages**. For the Alternative Stage projection we have tried to use information based on the observed trends in the past years.

- **Action Programs**. The last PILC stage or Execution Stage foresees the beginning of a series of Actions that lead to the recovery of the littoral and to a sustainable development of it. These Actions are articulated in the Action Plan and Social Sensitisation Plan. Likewise, another PILC final products is a Follow-up and Evaluation System that allows the control, not only of the Actions, but of the whole Plan, foreseeing possible plan changes in the philosophy, aims and methodology.

- **Participation, cooperation and direction**:

· **Scientific Commission**: formed by 5 littoral experts who have taken part in the definition of the methodology and in the risk and action evaluation.

· **Local Agenda 21 Civil Forum**: in a plenary session the citizens were consulted for the Initial Document presentation.

· **The Thematic Commission**: derivative of the Forum, it is formed by more than 20 representatives of all the population sectors of Calvià, plus investigations institutions that exercise its activity on the Balearic coasts.

· **The institutional cooperation**. The PILC Initial Document was presented in 2001 before different national organizations that have competitions in the littoral.

- **The reference Area**. The present document is based on the results obtained in a sufficiently representative reference area both from the Capacity Areas and from others like coastal problems of the municipality.

STAGE	PROCEDURE	DOCUMENTS	PARTICIPATION	RESPONSIBILITY
STAGE I <i>INITIAL</i>	Technical assistance selection Draft previous document Constitution scientific commission Contacts international organizations Draft initial document	State of the question International references Publication document Initial document	Scientific commission	Direction Coordination Technical assistance
STAGE II <i>ELABORATION</i>	Coastal system definition Studying team constitution Thematic and capacity reports elaboration Thematic Evaluation Capacity Evaluation Synthetic interpretation: SIG Draft debate document Advance Action programs	Coastal system definition Thematic reports International conference Field guide Document for the debate and advance of actions programs SIG "Letter" Web page	Scientific commission Civil forum Thematic commission	
STAGE III <i>EXECUTION</i>	Design and application of the programs of performance: · Action Plan · Social Sensitisation Plan · Follow-up and evaluation System	· Action Plan · Social sensitisation Plan · Follow-up and evaluation System	Scientific commission Civil forum Thematic commission	

Table 2. PILC Stages, procedure, documents, participation and responsibility.

AIMS FOR CALVIÀ'S LITTORAL

From the current and future situation study of the studied area, a series of aims were established to take place in Calvià's littoral. Each one of the aims was valued from 0 to 10 by the thematic commission formed by the principal agents who intervene in the littoral, the priority order being established doing the average of the punctuations granted by the voters. The 9 aims, in priority and importance order, are:

- Reduction of the coastal consumption and gradual recovery of the public maritime - terrestrial authority.

- Promote the recovery and sustainable management of the sandy coast.
- To anticipate and reduce the sewage and marine pollution presence and impact.
- To spread the knowledge and to promote the education and the investigation on aspects related to the sustainability of the littoral.
- To promote the recovery and conservation of the coastal area cultural and historical patrimony.
- Reduce and anticipate the coastal erosion and flood.
- To diminish the human impact in coastal areas with ecological interest.
- Recovery of humid areas.
- Control of plagues and exotic species invasion.

ACTIONS

The different studies and analysis led to the elaboration of a list of necessary actions to achieve the aims raised in the Plan and power to obtain a sustainable management of the littoral. These actions, which appear later, are applicable to the whole of Calvià's littoral, nevertheless, it is considered indispensable to make a diagnosis of the rest of the littoral with the Integral Indicators or, with the Warning Witness before the definitive Plan of Action is drafted.

Actions for the sustainable management of the littoral:

- PGOU modification to recover gradually the public maritime - terrestrial authority.
- To reduce the grant of licenses in the littoral and to execute and extend the Absorbing Plan Urban of 1994.
- Action Plan against floating sewage and it improves in the control of urban sewage, as well as the elaboration of an action plan before a temporary employee spill of toxic or dangerous substances in the sea.
- To avoid the artificial regeneration, to extend and to extend the systems of sand retention, re-introducing plants in sandy areas to help the sand retention.
- Limitation of the number of fixed moorings.
- Plan of control and reparation of rain, rivers and reparation net.
- Improvement of the purification and increase in the reuse of the purified water.
- Creation of a humid semi natural area with tertiary purification capacity in Santa Ponça.
- Recovery and amplification of small humid areas near to the rivers (elimination of rubble, exotic plants, etc.).
- Elimination of black points that imply an unnecessary or illegal consumption, of territory in the coastal area.
- Analysis Plan and, in case, architectural barriers elimination that interfere with the coastal dynamics.
- Creation of a good practices guide for the conservation of the littoral.
- To promote the environmental formation of the littoral workers.
- To stimulate plans of research regulation.
- Municipal funding for environmental education programs in the coastal area.
- Periodic elimination of invading plants and population control of seagulls and rats.
- Plan to fight the possible erosion and flooding.

Actually, a series of activities has already been carried out to manage to fulfil the aims:

- Study of the bacterial pollution of the Santa Ponça bay for effect of the emissary of the purified waters of the EDAR of Santa Ponça.
- Study of the environmental quality in the bay of Santa Ponça using the biological indicators: *Foraminíferos bentónicos*.
- Projects of research regulation.
 - Calvià's Open of sub aquatic photography.
 - Pilot scheme of sand retention in the Santa Ponça beach.
 - PILC diffusion, in itinerant exhibitions, in six beaches of the municipality.
- Informative campaign about not removing *Posidonia's* hassock in the Santa Ponça beach during the winter.
 - New strategy of monitoring and management of the algae "blooms" in the Mediterranean Sea "Strategy".
 - Coastal problems education campaign.
 - Beach management system (activity manual).
 - Draft of the environment protection ordinance for Calvià's municipality.
 - Elimination of the *Carpobrotus sp* invading plant.
 - Demolition of hotels with a high impact on the coastal area.
 - Campaign of sea beds cleanliness.

These actions have had a few very favourable results to obtain the sustainability of Calvià's littoral.

Finally, other actions that appear in the PILC and are pending to be accomplished are the following ones:

- Reintroduction project of the dune vegetation in the Santa Ponça beach.
- Creation of a humid semi natural area after the Santa Ponça beach.