

Stakeholders participation in ICZM at Marina di Massa (I)

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Abstract

Approximately 7 km of beaches at Marina di Massa are experiencing severe erosion as a consequence of a sediment deficit in the physiographic unit and of the construction of an industrial harbor at Marina di Carrara in the early 1920's. This coastal structure intercepts the southward longshore sediment transport, increasing the sedimentary deficit in the downdrift beaches. Different types of hard structures, such as seawalls, breakwaters and groins were built in the study area in order to protect the seaside resort and the coastal highway from shoreline retreat. Nevertheless, beach erosion proceeded and the tourist industry is now suffering from this retreat.

From the interviews undertaken for the project EUROSION, during the summer of 2002, it emerges that all stakeholders are very well aware about the Marina di Massa erosion problem. It is a common consensus that the existing coastal defense system cannot be considered a final solution to the problem above all for the presence of hard defense structures. Interviewees acknowledge the fact that at this point Marina di Massa needs an integrated coastal restoration project characterized by lower impact structures.

Although active, citizens' participation in relation to beach erosion problems has never been formally adopted by the Administrations. In addition, it must be underlined that only in recent times the majority of the citizens of Massa acquired a "tourist mentality", leaving their "industrial mentality" which considered tourism as an invasion of their territory with many negative side effects.

Communication processes between stakeholders are still weak, due to the fact that the new legal context, with the shift of competencies to the Regional Administration, is still in progress. The Regional Plan for Integrated Coastal Zone Management will improve both the cooperation and communication among the different Administrations that manage the coastal zone and the dissemination of information to the society.

Introduction

EUROSION is a project commissioned by the General Directorate Environment of the European Commission, which will result in policy recommendations for proper management of coastal erosion in Europe in the most sustainable way, using past experiences, as well as the current status and trends in a selected number of pilot sites inside the European Union and in accession countries (Eurosion 2003).

In the Work Package 3 of Eurosion at the selected pilot sites it was explored the involvement of local stakeholders in decision making processes, the knowledge and accessibility to the existing information by the stakeholders, the mechanisms of both communication between stakeholders and information dissemination to society and the prerequisites for implementing integrated coastal zone management practices. For the Tuscany Region it was decided to use Marina di Massa as a pilot site, which is located in the northern part of the regional coastal zone.

Study area

The study area is located in northern Tuscany and is part of a larger physiographic unit that stretches from Bocca di Magra to Livorno for about 63 km (Figure 1). The main river feeding this physiographic unit is the Magra River that runs for 62 km with a drainage basin of approximately 1655 km².

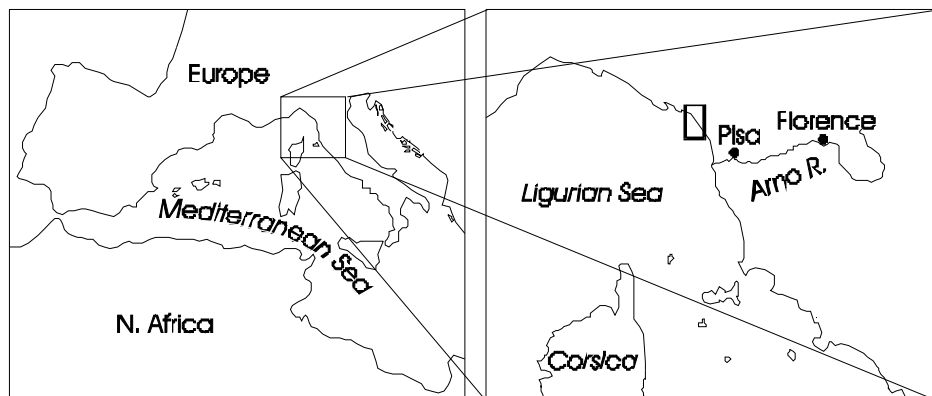


Fig. 1: Location map of Marina di Massa.



Fig 2: Marina di Carrara: beach accretion updrift the harbour is evident, as well as the downdrift erosion.

The construction of the industrial harbour at Marina di Carrara in the early 1920's caused the interception of the southward longshore drift, increasing the sediment deficit which was affecting the beaches fed by the Magra River (Figure 2).

Marina di Carrara beach, located updrift of the harbor, has experienced shoreline progradation for approximately 300 meters since the harbor construction, even though in recent years this beach has been almost stable as a consequence of a decrease of sediments coming from the Magra River (Cipriani *et al.*, 2001).

Marina di Massa, which is located downdrift, has instead experienced severe erosion since the early 1930's (Albani, 1940), even though in those years the harbor updrift jetty was 400 meter long against the present time 900 meters. In 1930 the first seawall was constructed in order to protect the coastal highway, and in 1957 a series of breakwaters were added, even though the beach had already vanished for a stretch of coast long 2 km south of the harbor (Berriolo and Siritto, 1977). In the meantime, shoreline retreat was gradually shifting southwards, thus a series of hard structures, such as seawalls, breakwaters, groins and submerged breakwaters, were built along the coast. Today, a 6.7 km long stretch of coast south of the harbour is protected by 9.3 km of hard structures (1.4 km of hard structures per km of coast).

In 1970 a sand bypass system was designed in order to transfer approximately 200,000 cubic meters/year of sand from the northern side of the harbour to the south. After several interruptions, the experiment was finally abandoned in 1974, due to the

expensive maintenance procedures and to the structural instability of the harbour's northern jetty because of sand dredging at its foot. This induced local Administrators to ask for more hard structures in order to stabilise the shoreline. Indeed, between Lavello and Frigido Rivers, groins and submerged breakwaters were able to stabilise the beach that was retreating at a rate of approximately 1 meter/year in the period 1938-1978 (Cipriani and Pranzini, 1999).

However, beach erosion continued to increase southwards. Figure 3 shows the evolution of the shoreline between 1938 and 1995 at Marina di Massa. Sectors A and B show a decrease in shoreline retreat after the construction of coastal defences, while sectors C and D show an increase of beach erosion as a consequence of the construction of the same structures.

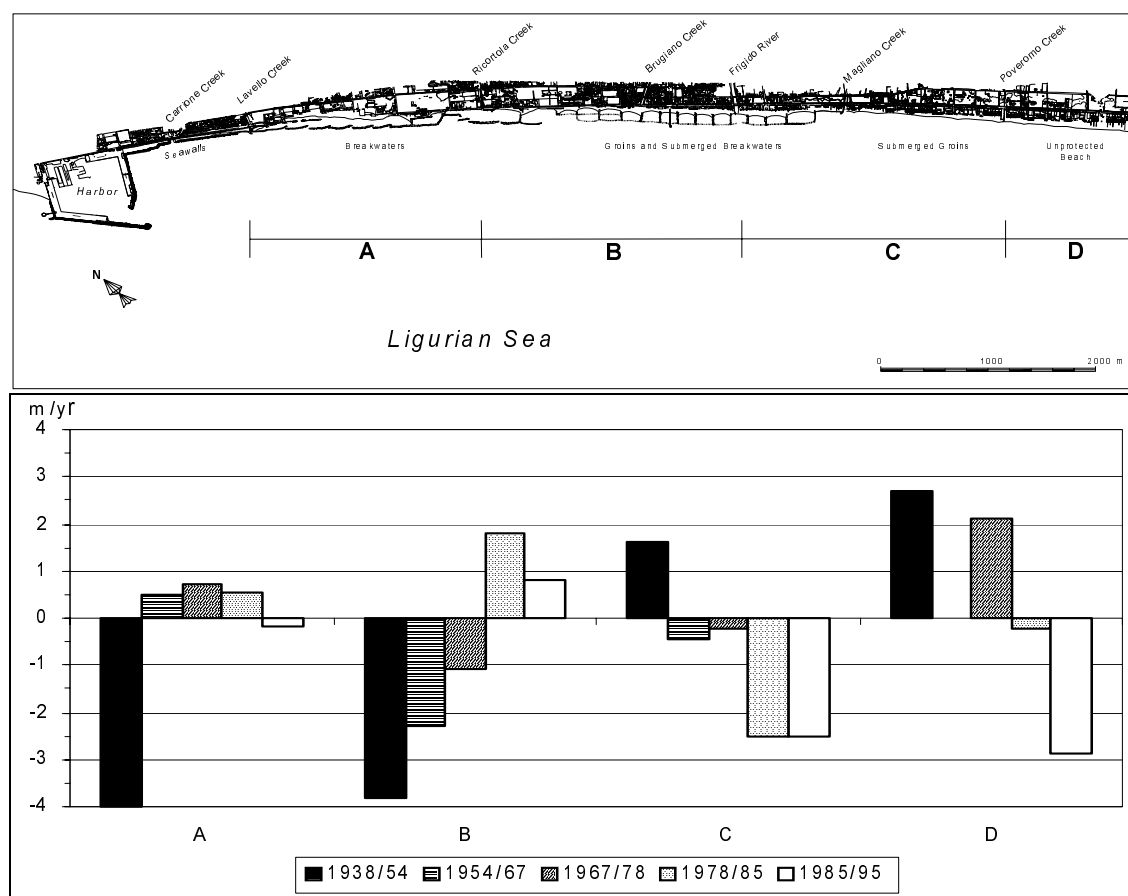


Fig. 3: Mean shoreline evolution at Marina di Massa between 1938 and 1995.

Needs for a coastal defense action

As previously mentioned, the main cause of coastal erosion along the beach at Marina di Massa, is the reduction in sediment input from the Magra River.

Mitigation against erosion has led to the construction of several types of structures in order to defend houses, coastal roads and bathing facilities. These structures were placed along the coast without a specific coastal management plan and an appropriate study of the morphological characteristics of the Marina di Massa beach.

The lack of precise information about how these hard structures work has caused severe erosion along neighbouring beaches. During this time the enormous economic value of this stretch of coast has made continuous anthropogenic actions inevitable to hold the line and preserve the beach.

Currently, one of the most important economic resources of Marina di Massa is the marble quarrying, however the main cause of urban, social and economic development is the tourism demand. For that reason, the “beach” has a strategic economic importance for this area; thus, requiring preservation.

Background on ICZM practices

Coastal zone management in Tuscany has, in recent years, undergone a slow but effective process of change, due to new legislation and to the effort of technicians and researchers belonging to Regione Toscana, local Administrations and University Institutes in Tuscany. The new strategy proposes the cessation of hard structures construction in order to defend coastal settlements and infrastructures from shoreline retreat, and to encourage the following: beach erosion prevention, use of soft engineering (beach renourishments), the abandonment of the existing hard structures.

A morphological and sedimentological beach monitoring program is presently being conducted along the entire length of beaches in Tuscany, with particular attention to areas where coastal restoration has been applied. This will provide enough information to ensure a correct coastal zone management and to evaluate the effectiveness of the new restoration strategies.

Administrative system

State - The Ministry of the Environment in cooperation with ENEA (Marine Environmental Research Center) is working on the “*National Guide Lines for Integrated Coastal Zone Management Plans*” to guide the Coastal Plans of each Regional Administration.

Regional Administrations - The new legislation in Italy (Legislative Decree 31 March 1998 n. 112, known as Legge Bassanini) shifts the responsibility for programming, planning and the integrated coastal zone management and coastal defense of sea-side resorts and infrastructures from the State to the Regional Administrations. As a consequence of the new legislation, Regione Toscana is working on the formation of a Regional Plan for Integrated Coastal Zone Management in cooperation with the local Authorities (Provincial and Municipal Administrations) and the River Basin Authorities. The Regional Plan follows the European Parliament and Council Recommendation concerning the implementation of Integrated Coastal Zone Management in Europe (COM(2001)533), in particular concerning the respect of natural processes and for the necessity to integrate the evidence and the emergency of defending the coastal area within the broadest management context. According to Regional Law n. 79/98 on Environmental Impact Assessment any new coastal defence intervention must be evaluated together with alternative options.

Provincial Administrations - Regione Toscana with Regional Law n. 91/98 shifts the competence on the design, construction and maintenance of coastal defense structures to the Provincial Administrations. In the Pilot Zone new coastal defense interventions will be undertaken by the Municipality of Massa which was designated by the “*Provincia di Massa Carrara*” as the subject that will design and build the restoration project in accordance with the study of the physiographic unit made by Regione Toscana (Provincial Board act n. 62 of 18 March 2003). The Provincial Administration will coordinate and make available to the Municipality of Massa the results of a 3D physical model of the restoration project.

Municipality Administrations - Regione Toscana with Regional Law n. 88/98 shifts the competence on the management of the “*Demanio Marittimo*” (Maritime Domain) to the Municipalities. From the beginning of 2002 the Municipality of Massa opened the “*Ufficio del Mare*” (Office of the Sea) to give information to the public and to assign and manage the concessions (rent) of the Maritime State Property (Demanio Marittimo).

The Integrated Coastal Zone Management Plan

The Integrated Regional Coastal Zone Management Plan for the Purposes of Hydro-geological Rearrangement that is currently being drawn has the specific aim of fostering the economic development of the coast through sustainability. In order to do so, it defines the functional relations between the different bodies involved in the attainment of the mentioned target. This regional planning tool became necessary in order to discipline the programming, planning and integrated management of actions connected with coastal and seaside resorts and infrastructures defense; the granting of concessions for state-owned areas reserved to internal and sea navigation or for territorial sea areas employed for uses other than the production of electric energy; and the protection and monitoring activities of coastal areas attributed to Regione Toscana by Legislative Decree n. 112 dated 31 March 1998.

As the duties referred to in the law include the management of the “whole coastal area”, it is evident that an effective and efficient implementation of these duties can only be guaranteed through a coordinated and coherent action of all the subjects involved: Regione Toscana for planning, programming and assessment activities; Provincial and Municipal Administrations for implementation and management activities. This also explains the need of finding organisational solutions to ensure the required effectiveness and coherence at a regional level, while at the same time guaranteeing the respect of the relevant area of competence, an integrated management of the coastal areas and an assessment of the global quality.

As far as the current situation goes, it is evident that coastal management must ensure that all the new actions fall within the general scope, which means finding tools and techniques that offer the opportunity of changing the trends in course in order to recover the whole coastal line and reintegrate it with the natural model. This means, for example, that defence and emergency measures must be undertaken only if they are functional in terms of re-establishing the balance of the whole physiographic unit.

Decision making

Process of decision making (administrative process)

On November 5 2001 the Tuscany Regional Board approved the Project of the Integrated Regional Coastal Zone Management Plan for the Purposes of Hydro-geological Rearrangement stating that the actual Plan must be defined in accordance with Provincial Administrations and with the other Institutional concerned actors (i.e. Municipal Administrations and River Basin Authorities). The approved project of the ICZM Plan contains the program of the urgent coastal defense and restoration actions to be undertaken in the next few years. Each intervention has an order of priority and the type of action planned was coordinated with Local and River Basin Authorities. The Tuscany Regional Council on January 29 2002 has approved the Program of the urgent coastal defense and restoration actions annexed to the ICZM Plan's project for a total of approximately 251 MEuro, and sent a copy to the Minister of the Environment, following the procedure set by the Italian Republic's President Decree n. 331/2001, for the partial funding of the works. Funding of the Program for approximately 103 MEuro was approved by the Toscana Regional Council on March 11 2003 as part of the program of strategic investments of Regione Toscana, and will cover all the urgent restoration projects along Tuscan beaches. Additional funding for approximately 6 MEuro was approved by the same act for the implementation of the studies of the coastal zone and the design and environmental impact studies of the future works.

On November 22 2002 a protocol of agreement was signed by Regione Toscana and the coastal Provincial Administrations to define the concerted strategy to draw the Integrated Regional Coastal Zone Management Plan for the Purposes of Hydro-geological Rearrangement as an instrument to address economical and social development through sustainability at regional scale.

Technical participation

The protocol of agreement mentioned above proposes the creation of a technical board in order to guarantee homogeneity and quality in the design activities. The technical board will become an official Regional Technical Commission comprised of two Regional coastal experts, two expert members from the Universities of Florence and Pisa and one coastal expert from each Provincial Administration.

The technical expertise of the University of Florence which has undertaken the coastal studies in Tuscany over the last 20 years is guaranteed by the presence of the Earth Science Department in the Regional Technical Commission. The technical expertise of the Municipal Administrations will be in cooperation with the Provincial ones.

Public participation

Public participation in the decision making process in shore protection has a long history in this area, due to the economic value of the beach and to the presence of several environmentalist associations which promoted workshops, conferences and projects. Articles on beach erosion are found in the local newspapers on a weekly basis.

Since the 1950's, although at that time the competencies on coastal protections were belonging to the State through the Office of the Genio Civile Opere Marittime, in Rome, several proposals were performed by private stakeholders, tourist operator associations, political parties and environmentalist associations. "Independent" restoration projects for the stretch of coast ranging from the Magra River mouth to Marina di Massa are to be found in several local and central Administrations offices and were never considered by the due office.

A key moment for the future planning of this stretch of coast was the Conference entitled "Convegno di studi per il riequilibrio della costa fra il Fiume Magra e Marina di Massa" organized by the local Administration in 1977 where several studies and projects committed by the Ministry, the Municipality and by private stakeholders were addressed and debated. General public and scientist participation was very large, the latter due to the beginning of a national program in the early 70's of studies on coastal dynamics sponsored by the CNR (National Research Council) including most of the Italian universities. Unfortunately, new softer solutions to beach erosion (*e.g.* submerged groins and beach nourishment) were not adopted and more breakwaters were added to the coast. The new hard structures, after continuous modifications were never supported by long term beach monitoring, finally resulted in the beach stabilization with associated a decrease in the beach and the sea water quality, and in the downdrift expansion of erosion.

In the middle of the 90's the debate on the future of this coast rose again among the owners of bathing establishments in the downdrift unprotected area, which was experiencing erosion at the rate of approximately 4 m/yr between 1985 and 1997. As a consequence they were seeking the construction of hard defenses in front of the beach in order to stop shoreline retreat but without any care for the neighboring beaches. In several public meetings new defense options were discussed and the Municipality of Massa, together with the Regione Toscana, started with an experiment to test the effectiveness of submerged groins in order to stop shoreline retreat. Most of the local stakeholders were gradually converted to the new softer philosophy.

Currently four submerged groins have succeeded in stabilizing the beach, demonstrating that this solution is suitable for Marina di Massa. A new project of gradual reduction of the present hard structures in the updrift beach financed by Regione Toscana was recently adopted by the local Administration. The final project is presently under design in cooperation with Municipal and Provincial Administrations. Funding for the implementation of the works for approximately 30 MEuro is available at Regione Toscana and is part of the Program of coastal restoration previously mentioned.

Generally speaking, public participation takes place at local level during public meetings of the City Council or at Regional level during Environmental Impact Assessment (hereafter referred to as EIA) procedures. Regional Law n. 79 of November 3 1998 disciplines public participation on EIA procedures and defines public as each person and/or community directly or indirectly involved by the project or activity. However, trying to define the meaning of *public participation* we must differentiate between *active participation* and *decisional participation*. According to the authorization procedures on environmental issues and to the included concept of right of

admittance with its recent evolutions, active participation must be guaranteed. The active participation principles are contained in the national law n. 241/1990, according to which: "Any subject with public or private interests, as well as any subject with common interests, or subjects constituting associations or committees for which a prejudice from the provision may derive, have the right to intervene in the procedure".

The concept of *decisional participation* refers to the so called negotiated and voluntary agreements which, from the examination of the national and European sets of rules regarding the admittance and the participation of the public, confirms the tendency toward environmental conflict management models with a growing active role of concerned citizens (Zita 2002).

Granted that the rules regulating the EIA of projects are difficult to comprehend and that it takes time for them to be understood especially by those who never confronted themselves with environmental problems the participation of the public to EIA procedures can be considered to be essentially related to a principle which may seem obvious but which produces important effects. The interest of the public toward environmental problems in EIA procedures grows in relation to the growth in time of the knowledge of the objectives and of the contents of the reference rules, as well as in relation to the number of procedures completed.

These two variables (time and number of procedures) are, by their nature, at the basis of any information and general interest growth process, without intending to exclude other factors of similar importance such as the spreading and the dissemination of didactic documents and of rule enforcement instruments.

The following are the main consequences and effects:

- With the increase of information, a subsequent increase of conflict has been observed (negative factor).
- Of late, public participation in EIA procedures has risen exponentially (positive factor).
- The public gathers in committees which are often organised as non profit organisations with social use (N.G.O.).
- The public's expectations which are sometimes conflicting are expressed at the time of the evaluation of the projects, with often distorting results; this is because today it is practically impossible to let dissents emerge in early stages of the process of decision making.
- Substantial mistrust in the institutions by the community.

As a consequence it is advisable to create a model for the management of the information and of public participation, which will be able to bring the citizen closer to the institutions. In addition, if participation does not guarantee conflict resolution we must improve "*Communication*". Communication is the set of the necessary initiatives which the proposing should set up in order to guarantee, even in preliminary phases of the EIA procedures, a confrontation with all the concerned subjects (stakeholders) on the problems regarding the opportunity to carry out a certain work, having as support for the discussion an advanced project of the work to be performed and alternative solutions (Zita 2002).

Social perception

One of the fundamental tools for a social perception analysis is the application of interviews to beach users in order to find out their perception of the erosion problem. The methodology adopted consisted in using two instruments: one based on direct observations with a checklist, and the other based on interviews using a questionnaire. The checklist is an extensive inventory list that has been filled in with the characteristics of the beaches under analysis by direct observation of the surroundings. Interviews with beach users are carried out with the aid of a questionnaire; it is an evaluation survey that presents a battery of 46 situations formulated in order to facilitate their marking using an evaluation from 1 to 10 on the aspects to be found at the beach. The questionnaires have a second part consisting of classification data where basic information on the interviewee is collected: age, sex, profession, habitual place of residence, distance covered to get to the beach, accommodation, frequencies of their visits, the reason why they choose this beach and so on.

In function of the presence of different kinds of coastal defense structures we divided the field of survey in two subzones; the first one is characterised by the presence of “hard” structures (groins and breakwaters made with rocky stones) while the second one is characterised by the presence of “soft” defense structures (beach nourishment and submerged groins made by polypropylene bags filled with sand). We limited the survey sites to the beach and the snack-bars placed on the promenade because those are the most visited and used areas from the social point of view. We carried out the survey in the period ranging from the 1st of July to the 20th of August 2002, when there is the principal tourist activity; in this period we had sunny days and the beaches were very populated.

The social perception analysis has been complemented with the opinions of the local officials (politicians, technicians, ecologist groups, tourist office, etc.) and the institutional officials (Town Hall, Regional government, Central government, University/research centres, etc.).

From the interviews emerges that all stakeholders are very well aware of erosion problem at Marina di Massa. While among experts and institutional stakeholders there is a more indepth analysis of beach erosion processes, economical stakeholders associate the construction of Marina di Carrara harbour the main cause of the erosion problem. It is a common opinion that the existing coastal defense system cannot be considered as a final solution of the problem above all for the presence of hard defense structures. All stakeholders call for more natural solutions even if beach users do like hard structures, and they are aware that a new solution could increase the erosion rate of the beach. It is a common opinion that, at this point, Marina di Massa needs a global project in order to restore the coast intervening with lower impact structures. Different opinions were collected regarding the construction of submerged groins made by polypropylene bags filled with sand recently tested along the beaches at Marina dei Ronchi and Poveromo: while many beach concession holders think that this is a temporary solution, institutional stakeholders and experts see the possibility to extend this solution to all the beaches of Marina di Massa in order to replace the hard structures with submerged groins. All interviewed stakeholders emphasise the necessity to artificially replenish the beach to alleviate the sedimentary deficit which characterize

the area. Beach concession holders grouped in S.I.B. (National syndacate of beach concession holders) invited the Municipality to join them on a technical visit to see the results of a nourishment projects recently undertaken along 45 km of beaches at Lido di Ostia (Rome).

The new competencies-sharing on the coast is still not clear for interviewed local stakeholders. Many economical stakeholders still ascribe to the office of Genio Civile Opere Marittime responsibilities to plan coastal defence actions seeing that for decades that office planned coastal defense structures as urgent interventions in order to protect the coastal town. About the question “How should we intervene?” we found two different schools of thought: experts, institutional stakeholders and many beach concession holders have faith in the results and the ideas proposed by the study of the entire physiographic unit made by the University of Florence and coordinated by Regione Toscana and hope that in the future the existing hard structures will be gradually replaced by submerged groins. On the other hand beach concession holders affiliated members of S.I.B. ask for a wide unprotected beach nourishment project using marine sand sourced from offshore sand reservoirs. Environmental associations have not presented any technical evaluation, but propose new mitigation strategies with a decreased human impact along the coastal zone. Beach concession holders have nevertheless considered obsolete the “beach use plan” made by the Municipality of Massa and ask for a new plan which will include a new design of the shore promenade with improved possibilities for the tourist industry. Beach concession holders have always played the starring actor role in order to involve the Public Administrations toward beach erosion problems; the relationship between the Municipality and the tourist industry is very close. However, beach concession holders associations have clearly stated that the efficiency of the Municipality is strongly related to the personal effort of individual employees when supported by the politicians, more than the actual organisation of the offices in charge with the special task.

Local mass-media are frequently used by tourist associations to alert citizens of the problem. Especially, local newspapers always keep in contact with beach concession holders associations after big storm events in order to establish eventual damages along the beach, especially during the winter season, or during political campaigns, when the coastal restoration projects are always promoted by politicians.

Conclusions

The study area is characterized by a potential conflict among industrial activities, recreational use of the beach and environmental conservation. As a consequence, in recent years, several decisions were taken which are considered to be a compromise that satisfies, in part, the demands of various social and economic actors.

During the last decades the request of participation in the decision making process by the stakeholders has increased, both by those interested in the economic outcome of coastal activities and by those more concerned with the environmental conservation. Interviews performed within Eurosion project demonstrate that expectations of the beach users do not fully fit with the beach restoration projects carried out by the local Administration. This is mostly due to the lack of public

awareness of the problems related to shore protection, coastal morphodynamics and associated bathing waters quality.

Presently, information exchange between decision makers and stakeholders is considered not to be effective, although the former prescribes that coastal zone management is one of the most important problems to be addressed in the coming years. However, local stakeholders have demonstrated an acceptance of new innovative solutions, if these are based on careful studies and followed by an effective monitoring program. The Regional Plan for Integrated Coastal Zone Management will improve both the cooperation and communication among the different Administrations that manage the coastal zone and the dissemination of information to the society.

References

- Albani, D. (1940), "*Le spiagge della Toscana settentrionale dalla foce del Fiume Magra ai Monti Livornesi*", Ricerche sulle variazioni delle spiagge italiane II - Le spiagge toscane, C.N.R., Roma, 11-86.
- Berriolo, G. and Sirito, G. (1977), *Studio per la sistemazione del litorale di Marina di Massa*, Atti del Convegno di studi per il riequilibrio della costa fra il Fiume Magra e Marina di Massa, Documento 2, Comune di Massa, pp. 16.
- Cipriani, L.E. and Pranzini, E. (1999), *Evoluzione recente delle spiagge toscane*. In: Rapporto sullo Stato dell'Ambiente della Regione Toscana – 1998, Regione Toscana, 77-85.
- Cipriani, L.E., Ferri, S., Iannotta, P., Paolieri, F. and Pranzini, E. (2001), *Morfologia e dinamica dei sedimenti del litorale della Toscana settentrionale*, Studi costieri 4, 119-156.
- COM (2001) 533, *European Parliament and Council Recommendation concerning the implementation of Integrated Coastal Zone Management in Europe*, Official Gazette of the European Community I, 148 of June 6 2002.
- Eurosion (2003), www.eurosion.org.
- Zita, F. (2002), *La partecipazione e la comunicazione nelle procedure di VIA*, Corso di specializzazione "La valutazione Ambientale Strategica", Centro Via Italia, Milano, Maggio 2002.