

Bay of Algeciras : Biodiversity Hotspot and Environmental Crisis Area

by

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Introduction

The bay of Algeciras situated in the South of Spain, lies at the Eastern limit of the Straits of Gibraltar and forms the gateway to the Mediterranean Sea from the Atlantic Ocean. Atlantic surface waters entering the Mediterranean Sea are bringing continuously oxygen-rich and nutrient poor water into the area. The bay also receives freshwater with nutrient rich runoff from two separate rivers, resulting locally in high phytoplankton concentrations. These brackish, estuarine-like conditions are crucial for numerous marine fishes at early stages in their life cycle. Subsequently dolphins and whales seem to thrive on these high productive spots. Main ocean commercial fish species, like swordfish and blue-finned tuna migrate into the Mediterranean Sea through the Straits of Gibraltar. And moreover large numbers of whales and sea turtles can be observed all year round in the Straits with common and striped dolphins particularly abundant in the Bay of Algeciras. Not only marine life is depending upon this unique area, millions of Palearctic migratory birds pass through the area every year on their way to their wintering grounds in Africa. And hundreds of white storks nest each year in the direct vicinity of the bay. The natural beauty of the bay was already well known during classical times, when Roman naturalist-geographer *Plinius* wrote articles on the area. In the same period, Greek historian-geographer *Estrabon* described the rich ecology of the bay and mentioned the enormous abundance of fishes and marine mammals. Also today it can be stated that the Bay of Algeciras hosts one of the richest mixes of marine and coastal Atlantic and Mediterranean life and deserves therefore to be a focus of national and international conservation efforts.



Figure 1 : Location of a series of natural sanctuaries set up in the Province of Cadiz

Quite some efforts have been brought about by the Spanish government to preserve the rich biodiversity through the creation of a series of natural sanctuaries. The area along the coast for example from the most Southern limit of the city of Algeciras until the city of Tarifa has been designated a marine reserve, indicated in red, *Figure 1*. The areas in dark-green are representing terrestrial natural parks.

But the existence of many species, habitats and the entire ecosystem of the Bay of Algeciras are under threat from various sources. Expanding human settlement, fisheries and especially the development of heavy industry, maritime traffic and extensive port development are posing today a heavy load on the environment and on the well being of coastal peoples. Simply designating limited areas with rigid boundaries, as natural sanctuaries might not be enough to preserve this unique ecosystem. A more integrated approach is needed in which economic development should be placed within the ecological and

social context. The creation of natural parks should not be used to buy good conscience in order to give way for unlimited pollution and industrial development elsewhere.

More and more residents of the area are expressing their concern for the deterioration of the environment and the ongoing industrial pollution. They unite within legal frameworks of environmental NGO's. Today the challenge for these groups will be not to mobilise as to compete fiercely with the private sector and policy makers, but to co-operate in

reconciling competing needs. All stakeholders of the bay should find ways of sharing the area equitably and sustainably – ways that meet the needs of all people as well as those of the environment and economic development. Obviously these needs are somehow intertwined, and resolving these competing needs collectively is providing a challenge. Local environmental NGO's have taken on the enormous task to initiate a dialogue with all stakeholders in order to formulate some sort of a sustainable management plan for the bay of Algeciras. The NGO's are however in desperate need for professional assistance from International Environmental Organisations as mediators and to lead the way.



Fig 2 : Map of the bay of Algeciras

This paper will give a brief introduction on major threats of the environment and will also address some social problems. We hope that this document will attract the attention of major International Environmental- and Nature Conservancy Agencies and that this will stimulate them to set up field projects in the bay of Algeciras, which is worthy of a protective status of international standing.

Maritime Traffic

Maritime traffic in the Straits of Gibraltar is impressive with over 80 000 vessels transiting in the year of 2001. Of this number 55 000 vessels corresponded to longitudinal traffic (between the Mediterranean Sea and the Atlantic Ocean) while 25 000 ferries crossed the Straits of Gibraltar in a North South direction between the European and African continent. The city of Algeciras situated directly in the bay, harbours the main Spanish commercial port with a movement of more than 50 million tonnes in 2001.

In Spain maritime traffic is surveyed and managed by the Ministry of Transport: SASEMAR acronym for Sociedad de Salvamento y Seguridad Maritima. This unit is responsible for maritime traffic coordination and pollution mitigating operations. Local operating units as in the Port of Algeciras are belonging to the group of State Port Authorities. In Algeciras a Service Coordination Centre was set up within the framework of a National Rescue Plan that aims to safeguard life and to mitigate marine pollution. This centre has to coordinate operating units - which fall under the responsibility of different administrations - in case of environmental incidences.

Some ships are indeed posing serious potential threats for the environment by carrying hazardous substances. In 1999 a container with high toxic cyanide compounds fell of a ship in the port of Algeciras. The sealed container was fortunately entirely fished up from the bottom and it may be assumed that official statements were genuine that no leaking into the environment took place. Some fish mortality was nevertheless observed right after the accident. These kinds of incidences, which are numerous, illustrate that port authorities need extreme vigilance.

Container ships are not the only vessels that frequent the bay of Algeciras; large numbers of petrol tankers enter the bay seeking the Oil refinery – CEPSA –. The area around the oil terminal is polluted due to spills that occur during discharging and recharging the load and subsequently by products used to clean out the tankers. A foundry company called Acerinox, also constructed a ship terminal next to the refinery and attracts major vessels. This company sometimes deals with disposal of dangerous material including radioactive

waste. Small terminals of canning factories for fisheries products are attracting smaller vessels.

Ballast water from all this maritime traffic is enhancing risks on the environment. Ships are carrying water from every corner of the world and could easily transfer exotic and harmful organisms into the bay, like toxic dinoflagellate phytoplankton species. Especially in the summer these toxic algae, mostly of tropical origin may form blooms - also called red tides - when temperature of surface water rises. Shellfish filtering the water, bio-accumulate toxins produced by the algae and may transmit diseases upon consumption like Diarrheic Shellfish Poisoning (DSP) or worse Paralytic Shellfish Poisoning (PSP), resulting in instant death. Some red tides have already been observed in the bay. International guidelines have been set up to minimise risks caused by ballast waters in areas that are designated as Sensitive Marine Waters. Implementing these guidelines in the bay of Algeciras surely deserves some consideration.

Yachts ports situated in the urban areas around the bay, in Gibraltar, La Linea de la Concepción and in Algeciras, provide maintenance services for vessels that need repainting and anti fouling products are widely used. These paints contain highly toxic substances – Tri Butyl Tin – and are known to adversely affect the ecosystem. Extreme low concentrations cause sexual deformities in shellfish. These compounds acting as biocide products will be completely banned by the year of 2008 by the IMO – International Maritime Organisation – as soon as alternative products will be made available on the market. Working with such paints demands extreme vigilance, which is not always the case in the bay of Algeciras. The extension of the yacht port in La Linea should therefore be specially equipped with waste disposal for scraped-off paints and with a system to minimise leaking of newly used paints into the environment. Efforts should also be made to ban already the most harmful paint brands instead of waiting for future IMO rules to be implemented.

For the whole Mediterranean it was estimated that every year some 600 000 tonnes of crude oil are spilled into the sea, mostly due to illegal tank cleaning. A further 300 000 tonnes are spilled accidentally. Beaches filled with crude oil drops in and around the bay of Algeciras are testifying that these illegal practices and accidents are quite common in this region. This is not only demanding a heavy toll on the environment but this is also affecting seriously the tourism sector, which depends upon a clean coastal line. The beaches east of the bay are every year cleaned up before the start of each tourist season, but some parts in the bay and on the western side of the bay, in Tarifa – Europe's most famous surfer paradise – this is strangely enough not the case.

It will be naïf to think that the Algeciras Port authorities with the implementation of their National Rescue Plan and the coordination of traffic can prevent or even mitigate every risk. Apart from pollution and oil spills, also ship break is likely to happen as poorly maintained ships navigating under flags of dubious countries are crossing the straits every day.

Commercial port extension in La Linea and Campamento

The commercial port in Algeciras has apparently reached its limits and therefore plans are made to extend the container port to the other side of the bay in Campamento and in La Linea de la Concepcion. In fact the commercial port will double in size. When these plans were first made public, local inhabitants reacted immediately through the creation of the NGO, *Plataforma Crinavis*. Peoples are over-saturated by the stress the already existing industrial plants are posing on the environment and on their well-being and they want to put a halt to this planned development scheme. An environmental impact study on the port expansion was carried out but was paid for by the port authorities and therefore we could put question marks whether this study is really objective. This study for example has not included socio-economic factors. Also from an environmental point of view we could put question marks whether the carrying capacity of the ecology has not already reached its limits. Bentic organisms for example are already profoundly affected by the

existing port and the size of sea grass beds in the whole bay decreased dramatically. Entire ecosystems that are associated with these sea grasses disappeared. It is also worrying that the final report of the impact study was hardly accessible. The report comprises several volumes and exceeds more than thousand pages and it is therefore extremely difficult for an outsider to properly consult the study. But seemingly the conclusion of the study was positive for the Port expansion and construction works have already began in Campamento.

The problem with such impact studies in general is that they are mostly exclusively focussed on the future construction and they take rarely into consideration the already existing sources for pollution and stress. Studies that add the existing pollution sources up to future pollution are of course more realistic. Outcome of such a study could be less positive for this planned development scheme. In other words the future port might be the so-called final straw that could break the camels back. At least a number of people living in La Linea feel so. *Plataforma Crinavis* was continuously in contact with local governments to put a halt to further construction and demanded for an alternative impact study to be made. But local governments never took *Plataforma Crinavis* seriously and failed to communicate with them in a genuine way. *Plataforma Crinavis* recently contacted the “Ombudsman” of the European Union to address their dislike.

A study on the management of the existing port in Algeciras should also be made, especially on the question whether present surface is being used optimally and whether the extension is really necessary. Not even half of the existing port is being used. The need for the building of the planned extension is highly speculative and based on prognosis that worldwide maritime traffic would increase. These extra vessels could easily use the spare surface of the already existing port. Moreover the prognosis that were made some years earlier should be subject to revision as it became clear that maritime traffic is decreasing instead of increasing. The real reason for the development scheme is the system of money distribution on a national level. If port authorities had not applied for a budget for port extension, the money would have been re-allocated to other ports in Spain. And of course the input of European Union funds contributes to this mentality. In other words the authorities created a “need” in order not to miss-out on major subsidies.

Construction site in Campamento

A part of the area for future port development forms currently a construction site for a floating pier, which is built for the harbour of Monaco. These works will continue until August 2002. In order to build this pier, made out of concrete, a hole was dug under sea level and subsequently seawater is seeping into the hole and is continuously pumped out. This pumped-out water forms a mixture of seawater, concrete and probably highly toxic products that are used to mould and prevent swelling of the concrete. Not only the toxic products are directly threatening the ecosystem, also the dissolved concrete is making the surrounding waters alkaline. A fish farm situated just in front of this construction site complained at the beginning of the works. The fish farmer obviously noticed a profound impact on his reared organisms and it may therefore be assumed that the surrounding ecosystem was also markedly affected. In the summer of 2001 the beaches surrounding the construction site were closed for bathing.

Heavy Industry and air Pollution

In 1969 the Oil Refinery of CEPSA in the bay of Algeciras was officially inaugurated. Presently the refinery has an overall distillation capacity of 11 million tonnes of crude oil per year. Some plants produce fuel for jet engines while others are intensively active in petro-chemistry. They manufacture added-value products like plastics, synthetic fibres and detergents. Paraxylene is transformed into purified terephthalic acid (PTA), dimethyl terephthalate (DMT) and isophthalic acid (PIPA), all raw materials for the manufacturing of polyesters. Currently this CEPSA site is producing annually 450,000 tonnes of PTA,

90,000 tonnes of DMT and 30,000 tonnes of PIPA. Plans to enlarge the capacities for the production of another 350,000 tonnes of PTA are currently under consideration.

For the manufacturing of CEPSA's chemicals, four processive steps are needed, separating, conversion, reorganisation and finishing. In these processes, unwanted substances are removed and the chemical itself is made more suitable for consumption. These purification processes release various gases and fuels into the air as well as discharges of unwanted liquids. As chemical based pollutants are released into the air, water and earth, the toxicity does not merely affect the ecosystem but dominoes into the invincible human world as well. These effects of the chemical industry come to us in the form of acid rain, or drift down as fall out which creeps into agricultural soil, carries itself into the systems of wildlife and finally enter into human bones where this toxicity will remain until death. Thus CEPSA is proving to be an indestructible poisonous chain. In general the manufacturing process in the chemical industry continues to be the number one polluter of the environment anywhere in the world. Long term exposure, especially to air pollution of the petro-chemical industry, is known to provoke cancer in surrounding inhabitants.



Figure 3 : CEPSA industrial plants in the bay of Algeciras

The occurrence of high cancer rates in the province of Cadiz is well known. Various groups from the health sector are demanding for an epidemiological study to be made but their demands are continuously declined. The problem was addressed one year ago on Spanish National Television. The programme however linked this high cancer rate directly to the bad life-style of the Andalusians and it was said that these people smoke too much and drink too much and do not get enough sleep. No word was being said about the two major chemical plants in this very same province. An elevated cancer rate in the province of Malaga does not exist, peoples that share the same cultural identity as the peoples of the Cadiz province and it may therefore be assumed that they smoke and drink as much. Of course the presence of two chemical plants is most likely to be the direct cause for the elevated cancer rates. The conclusion of the television programme is an outrage and typical for the Spanish attitude towards Andalusians. These peoples have always felt marginalized by their central government and the rest of Spain. Their feelings and ongoing suffering are expressed in many flamenco songs that nowadays also deal with environmental issues.

The emissions of the CEPSA's chimneys are however said to be within national and even the European norms. The occurrence of high cancer rates is nevertheless an indicator that these norms should be subject to revision. Moreover National and Supranational policy makers should also realise that some plants, like CEPSA in the bay of Algeciras, are situated in areas of natural beauty with an extremely rich biodiversity of international importance. Special norms should therefore be formulated for industries situated in these kinds of regions in order to preserve them. Similar special regulations do already exist for the management of ballast water in Sensitive Marine Waters. It is therefore more than logic that special regulations should also be formulated for air pollution.

As observers living in the area with good faith in norms set up by national government and the European Union, it is however hard to believe that the emission rates of CEPSA's refinery are within the legal boundaries. Every day thick black and yellowish smoke is emitted by their chimneys, provoking unbearable odours precipitating in black coatings on windows. Laundry left to dry in the open air is getting dirty and smelly. The smoke is so unbearable that peoples of the UK territory of Gibraltar even consider the presence of the CEPSA refinery as a serious attempt made by Spanish government to smoke them out. Also on the Spanish side, peoples are expressing their dislike by writing protest paroles on walls that are in the line of: "CEPSA kills us all with cancer". These writings are erased regularly and over painted but reappear every time. Of course these opinions are based on strong emotional feelings and more objectively it could be said that the choice for the location of CEPSA was not made with the aim to smoke the British out of Gibraltar or to cause cancer amongst the Andalusians. These choices were based on the fact that the location of the refinery is highly strategic – the same could be said for the container port of Algeciras –, situated in-between the Atlantic Ocean and the

Mediterranean Sea at one of the busiest highways for maritime traffic. Moreover the bay provides excellent conditions for ships to accost all year round even during bad weather conditions when the semi-enclosed bay is offering a quiet sea. But CEPSA's solution to continuously over paint protest paroles is not the solution to take away the dislike. An open-minded dialogue should be initiated between CEPSA and peoples living in the vicinity. Just informing them on the Internet that emission rates are within the norms is surely not enough. And even if this would be really the case, emission rates should be further brought down, as its effects are so profound and visible.

Also from a safety point of view, the inhabitants surrounding the CEPSA plants are quite concerned. Over the past 30 years they have witnessed numerous accidents. Sinking petrol ships and explosions in the oil terminal, resulting during one incident in death of numerous CEPSA workers.

CEPSA's statements on their official web site are saying that their industrial activities are in harmony with the environment. These statements will be more credible and would feel less propaganda like if more efforts will be brought about. Groups such as the Business Council for Sustainable Development and the Superfund are one step closer reaching the ultimate goal of chemical safety. The Business Council for Sustainable Development is a group of corporations that all want to improve their companies by making them more environmentally safe. DuPont for example, a company similar to CEPSA now produces less waste, and more environmentally safe products. In 1993 DuPont decreased toxic air emissions by at least 60%, and by the year 2003, they hope to reduce emissions of carcinogens by 90%. CEPSA should try to become a member of the Business Council for Sustainable Development and learn from their experiences and implement them in their own business.

Acerinox catastrophe

The environmental crisis of the bay of Algeciras became World news when in June 1998 a plume of radioactive caesium-137 was detected across five European countries. The radioactive cloud had been detected in France, Switzerland, Austria, Italy and Germany - but - strangely enough - not *officially* in Spain. Experts however and also Greenpeace reported that radioactivity levels were up to 1,000 times higher than normal. Its source was eventually traced back to a foundry company in the bay of Algeciras, owned by a company called Acerinox. No legal actions are known to have been brought against the firm in Spain. In Italy however public prosecutors are charging the two directors of Acerinox with "dangerous disposal of material" intended to sully, offend and molest individuals, especially the inhabitants of Turin and surroundings." It caused atmospheric and "considerable" ground pollution, according to the prosecutor. The charges have been brought following a yearlong investigation into the accident, which happened when a caesium-137 source was inadvertently smelted along with a shipment of scrap metal. Italian magistrates say that the release happened because of a temporary mechanical fault at the plant combined with a lack of manual checks on input materials. The two Acerinox bosses claimed that the accidentally smelted caesium-137 had been contained in a scrap metal shipment from the USA, purchased through Dutch intermediary, Jewmetaal. But the prosecutor said that he and his colleagues had not been able to establish that Jewmetaal supplied Acerinox with the radioactively contaminated shipment. The outcome of this prosecution is still unclear.



Figure 4 : aerial view of the Acerinox plant

The most striking part of this whole affair is that in Spain no legal actions were undertaken against Acerinox. If the environment in Italy was highly contaminated by this accident we can only deduct from this that the impact must have been much more profound in Spain itself. The almost complete denial of the Spanish government in this affair is a scary thought. It therefore justifies the lack of confidence of many people living around the bay of Algeciras in their own government when it comes to environmental

issues. Even more reasons why International Environmental Organisations should set up field projects in the area to act as mediators between local NGO's and their government.

Private sectors depending upon a healthy ecosystem

Economic sectors that directly depend upon a healthy ecosystem do exist in the area, like fisheries, livestock farming, agriculture and the tourism sector. Every urban area around the bay was traditionally a fishery village. All sectors depending on natural resources are obviously under threat from industrial pollution and could therefore be powerful partners for local NGO's to put forward more attention on the environment.

But these sectors in itself are also causing some stress on the environment and should therefore not be left unmentioned. Fisheries in the area have led in recent years to uncontrolled fishing of undersized specimen. Today it can be said that 83 % of all blue-finned tuna and swordfish in the whole of the Mediterranean Sea including in the Straits of Gibraltar is undersized. Also the use of driftnets is causing accidental death of many cetaceans and the use of long lines is known to by-catch large numbers of marine turtles and sea birds. Obviously regulating these activities needs to be included in the to-be proposed management plan for the bay of Algeciras.

Intensive agriculture further stream upward of the two rivers that end into the bay is causing increased organic chemical run off. Livestock is causing similar problems although in a lesser extend.



Figure 5 : Whale watching vessel

Whale watching boats that take tourists out to see cetaceans mainly represents the tourist industry in and around the bay. This business is booming and more and more vessels are observed each year. This ever-expanding sector is about to become a source for stress on the marine mammals that are literally chased by whale watching boats. The companies in Tarifa who frequent the bay especially during bad weather conditions, are very aware of such a risk and managed to work out some ethical code of good conduct amongst each other. But most companies are situated in the UK territory of Gibraltar where no such code exists. Implementing a code for these vessels will be one of the recommendations made further down this text.

Turning the tides and a need for more research

At first glance, summing up all the potential and real factors that adversely affect the ecosystem of the bay of Algeciras may be overwhelming. The courage to give nature a helping hand might drop in one's shoes, when looking at all these problems. And pressures of expanding human settlement accompanied with more urban waste and more sewage water were not even mentioned. Much of the sewage water, especially from the town of Gibraltar, is flushed down into the sea without any prior treatment. Also military air force activities in Gibraltar are contributing heavily to air pollution and are a major source for noise pollution.

But it must be clear to everyone that the unique ecosystem in the Bay of Algeciras and the Straits of Gibraltar is worthwhile protecting, only by regarding the abundance of marine mammals. We are just about to get a glimpse on the secrets of population dynamics of whales and dolphins that depend upon this ecosystem. Up until now only scattered and – but still valuable - amateur like information was available. Only recently the Universities of Cadiz and Malaga have set up a more academic research project in collaboration with other European Universities. Collected data will be made available and will be made interchangeable with other research projects on cetaceans in the Mediterranean Sea. At this early stage the research is provoking more questions than answers and past assumptions that the Straits of Gibraltar is a highway for migrating whales is being

questioned. Present findings indicate that the cetaceans seem to stay in the area instead of migrating through. Even more reasons to carefully look after this ecosystem.

The polluting industries are however already built and operating and it will be unlikely that they will disappear. Working collectively to find a balance and to find solutions in order to mitigate environmental pressures and pollution will therefore be the only way. The intention of the authors and many local environmental NGO's is not to fight off the industrial "monster" like Don Quijotes living in a dream world. The industries provide for work and livelihoods of many people are depending upon them. Moreover, the province of Cadiz is facing high unemployment rates and therefore we can understand the position of local governments favouring economic development. But policy makers should realize that the bay of Algeciras is not only providing perfect conditions for port development and industries but is also providing unique conditions for a rich biodiversity on which dolphins and whales depend. Nowhere else in the world marine mammals are so concentrated and can be observed all year round. Policy makers should also realize that economic development does not necessarily equals industrial development. On the contrary, industrial pollution might on the long term enhance unemployment when sectors depending on natural resources will loose their means of survival. The bay of Algeciras could be a perfect area for the development of less polluting sectors like ecological and cultural tourism.

The bottom of the bay of Algeciras is for example filled with shipwrecks from the 18th century when Gibraltar was under siege. Setting up SCUBA diving centres along with the promotion of the historical and natural aspects of the bay might attract more tourists. Even the implementation of a sustainable management plan for the bay of Algeciras could be a tourist attraction in itself, provided this is accompanied with good educational material. But like the ecology, the historical heritage lying on the bottom of the bay is also under threat from industrial construction works. The site in Campamento accidentally ruined a shipwreck while preparing the building site for the Monaco harbour pier. We can therefore assume that works on the extensive port development, situated in this very same area, will destroy more shipwrecks that may be of historical importance.

When taking a closer look at the bay it must be stated that the ecosystem is also showing quite some resilience. Whales and dolphins are still around and white storks are practically nesting on the terrains of CEPSA and Acerinox. Turnover rates of waters in the bay are high and air pollution is quickly diluted by strong winds that blow over the area all year round. It is therefore not too late to turn the tides and to preserve what is left of the rich biodiversity by implementing a sustainable management plan for the bay of Algeciras. But too little research was carried out to provide for a scientifically based management plan. But these are of course no reasons to step aside and just hope for the best. It is everyone's gut feeling that the present situation is providing shaky conditions to sustain this unique ecosystem in the future. The precautionary principle is to be used and efforts to formulate a sustainable management plan for the bay of Algeciras should already be brought about, while waiting for more scientific proof.

Need for an international framework

Formulating sustainable management plans based on precautionary principles will mean involvement of all stakeholders. This means not only the private sector and government institutions but also populations, scientists and environmental NGO's. All parties should be able to get their message across on an equal basis. Like already indicated, involvement of international partners is capital and are needed as mediators between different stakeholders that presently seem not to take each seriously or trust each other. Many environmental NGO's are disappointed in their governments, like *Plataforma Crinavis*. They currently ceased dialogue with local governments and are now putting all their cards on the European Union to put a halt to the Algeciras port extension. Also the cover-up of the government concerning the Acerinox catastrophe contributed to suspicious minds.

Political tension between Spain and the UK territory of Gibraltar is one more reason for the need of mediators from International Environmental NGO's.

Besides local NGO's that try to make their contributions to protect nature, most people in the region fall into complete lethargy when it comes to environmental matters. They are overwhelmed by the problems and see no way out. They believe upfront that their energy spend for the environmental cause will be wasted. Quite some work on raising environmental awareness is therefore needed if we want these people to express their opinion on what this sustainable management for the bay should look like. Peoples who work for polluting industries is another group that will be hard to reach because they will be probably afraid to loose their jobs if they would get involved. Also the younger generations that have lived all their lives next to the polluting industries seem not to care much about the deterioration of their environment. They have seemed to accept the industries and show what you might call signs of habituation, which means that they no longer perceive the pollution. This group is also the least aware of the rich biodiversity that surrounds them. Many people living around the bay do not even know that there are dolphins and whales almost in front of their doorsteps. Older generations however are aware and remember the days when the bay was extremely beautiful. They witnessed the change that took place and will therefore be more sensitive and easier to mobilise to undertake action. But when talking to people of all these groups, whether active or not for the environment, they all feel sympathy for a project that aims to mitigate pollution. Once more International Environmental Organisations are needed to break down the negative spiral of attitudes towards to environment. International NGO's should show the way out.

Another advantage of working with International NGO's is that they provide for a larger context. Matters that can not be resolved on a local level like proposing a legal framework for the future management plan could be addressed on a higher level with the central government in Madrid or even with the European Union in Brussels. Local NGO's could also benefit from the big network of experts that are linked with these kinds of organisations. They could learn from experiences that were made elsewhere and use them for their own situation.

A management plan for the bay of Algeciras and recommendations

Since we face a lack of scientific data, the first step to formulate a sustainable management plan could be to consolidate all existing expertise regarding the ecology and the threats of the bay, regardless anyone's scientific background. People, whose livelihood is directly affected by the ecology, are educated by nature itself and can therefore make valuable contributions. The advantage of working with people from fisheries and agricultural sectors is that they mostly do so since several generations. Via stories that are transmitted from father to son, they have a clear picture of the natural history of the environment. This kind of information could be valuable to set up guidelines and goals to what extent and in which direction the ecosystem needs to be restored and preserved. These people also have clear ideas on which and when different polluting sources contributed to what changes in the environment.

The next step could be to gather information on sustainable management plans made elsewhere in the world, of areas that faced similar problems. The Nordic countries in the Baltic Sea for example, reward ships that are environmentally safe – possessing a “green shipping certificate” – with lower port taxes and at the same time environmentally unsafe and polluting ships are penalized with fines. This reward and fine system discourages unsafe vessels to penetrate the Baltic Sea and will encourage these ships to invest money to make their ships environmentally safe. The Port of Algeciras has already put into practise the system to lower port taxes for green award ships. But they could take things a step further through also penalising ships that are environmentally unsafe. In order to prevent unequal competition with ports that do not implement such system, International NGO's should bring about efforts to install this system in every port of the Mediterranean Sea. Like this, less unsafe ships will pass through the Straits of Gibraltar, greatly reducing risk of shipwreck. And of course this system should not only be limited to the commercial

port of Algeciras but should also be extended to the oil terminal of the CEPSA refinery and the terminal of Acerinox.

Another step could be to obtain international recognition from for example UNESCO or the UNEP for the bay of Algeciras as a region of special interest. International legislation that accompanies such labels will force local governments to implement a sustainable management plan. For example special regulations for ballast water discharges will come into force, greatly reducing risks of invasion of alien species and red tides. Another advantage of such recognition is that this will empower local environmental NGO's during stakeholder meetings with private and public sectors.

The following list of recommendations could be made for a better environment of the bay, and every point should be discussed during future stakeholder meetings:

- ✓ Inventory on the ecology of the bay and its sources for stress and pollution
- ✓ Nominating the whole bay of Algeciras as an area of special interest
- ✓ Alternative impact study on the Port of Algeciras extension
- ✓ Environmental impact study on discharges of the construction site in Campamento; the concrete pier construction for the Monaco harbour
- ✓ Enhancing environmental awareness with all residents
- ✓ Study on enhancing efficient use of the already existing port of Algeciras
- ✓ Studies on the development of non polluting economic sectors
- ✓ Special regulations for ballast water discharges in the bay of Algeciras
- ✓ Installing a fine system for environmentally unsafe vessels
- ✓ Special regulations for the handling of anti fouling products
- ✓ Banning of the most harmful anti fouling paint brands containing Tri Butyl Tin
- ✓ More surveillance on illegal tank cleaning
- ✓ Clean up actions of crude oil on all beaches
- ✓ Independent study on emission rates of CEPSA
- ✓ Epidemiological study on high cancer rates
- ✓ Sewage water treatment
- ✓ Lowering organic runoff of the agricultural sector
- ✓ Special regulations for fishing gear
- ✓ Legal framework for an ethical code of good conduct for all Whale Watching vessels
- ✓ Environmental education at primary and secondary schools
- ✓ More applied research
- ✓ Study on a legal framework for air born pollution norms in areas of special ecological interest

We hope that this “helicopter view”- information on the bay of Algeciras will incite you to consider the area for your future activities. We want to put the bay of Algeciras on the World map again like during the days of the Roman Empire when famous writers praised its natural beauty. Nowadays the bay only becomes World news when environmental catastrophes occur. The ongoing industrial development is becoming more and more an excuse for policy makers to regard the bay as a trash can. Industrial development is continuously stimulated with high unemployment rates as the main argument. And sustainability seems to be an unknown principle in the region. We feel that this mentality should really belong to the past.