

NATIONAL INTEGRATED MONITORING AND ASSESSMENT PROGRAMME (IMAP) FOR COAST AND HYDROGRAPHY INDICATORS FOR LIBYA

Introduction:

The coastline of Libya extends over 1,970 km and is characterized by its relative homogeneity since there is no marked differentiation of its topography and geomorphology. The seabed topography is also characterised by a relative homogeneity with a gradual extension of the continental shelf covering a surface area of about 65,000 km².



The population of Libya was estimated in 2013 at 6 million with a growth rate of 4.85% per annum. Most of Libya's population is concentrated along the Mediterranean coast and around the country's oilfields, with a density population in the Tripoli and Benghazi areas estimated between 11 and 500 inhabitants per km².

In 2013 it was estimated that agriculture accounted for 2% of GDP, industry accounted for 58.3%, and services accounted for 39.7%. Oil exports account for over 95% of Libya's hard currency earnings. Since the discovery of oil in the 1950's, this economic activity has rapidly expanded while the relative importance of agriculture has declined

The hydrological conditions of the coastal region are dominated by three water mass layers. The surface layer, with low salinity is relatively poor in nutrient. It comes from the Atlantic,

crosses Gibraltar and moves eastwards. The intermediate layer with a maximum salinity of 38.75‰ and a high nutrient level. It moves westward out of the Levantine Sea. The deep layer extends from below the intermediate layer (at a depth of >1000 m) to the bottom. The water of this layer is very homogeneous flowing from the nearby Adriatic. It is very cold and less saline than the intermediate water.

In coastal areas of Libya, the dominant climatic system is Mediterranean, with warm summers and mild winters. The prevailing winds are from the north and east between May and October and from the north and west between November and April. Occasionally, strong south to south-east winds, known as 'Ghibli', occur. The highest average wind speeds occur during the winter months (November to February, up to 18 knots of average wind speed) and are lower in intensity (around 6 knots) from June to August. The mean temperature is 15-17 °C in February and 25-28 °C in summer.

The water dynamics in the area between Sicily and Libya present many different branches and meso-scale structures with flows at speeds that can reach up to 50 cm/s, as widely reported. The temperature through the water column between Libya and Sicily varies between 12°C at depth to 27-28°C at the surface, while salinity varies between 39 and 37 from depth to surface.

Important portions of the coastal zone of Libya are still in very good natural condition. However, some portions of the coast are under anthropogenic pressure generated by petroleum exploration and exploitation, fisheries and urbanisation of the coast.

Fishing activity in Libya is an active and growing sector of the economy. Although the sector employs a low number of Libyans, it can be classified as one of the main economic activities for the population in the coastal area

Libya's fishing resources remain largely unexploited, despite a considerable potential for expansion. With more than 1700 km of coastline, the local waters yield ample supplies of tuna and sardines as well as numerous other species. There are four main fisheries types of fishing activities carried out in Libya: artisanal coastal fishing, lampara fishing, coastal trawling and tuna fishing. Most of the fish catchments come from the nets of artisanal vessels targeting demersal fishes and lampara targeting the small pelagic fishes, while the tuna industrial fishery provides less than 4% of the total landed.

Tourism in Libya was for many years a minor contributor to the national economy, but following the adoption in 2005 of the Law no 7 on tourism development, a national tourism plan was developed and included the identification of sites suitable for tourism development. Most of the identified sites are located along the Mediterranean coast. However, the current political situation in the country stopped the development of some economic sectors such as tourism.

Libya has great potential for tourism with more than 1700 km of coastline, five UNESCO World Heritage Sites (three located on the coast) and Mountain and Desert tourism. A growing diving industry is developing as the country is increasingly able to host tourism. Tour companies based in Janzour, a tourist village on a long sandy beach close to Tripoli, offer sightseeing and diving from a number of destinations: Zwara, Amatshok Beach, Tajora Beach and Al Garaboli Beach. However, tourism has remained considerably underdeveloped due to past conflicts and recent world isolation.

The main threats to the marine environment in Libya are linked to the uncontrolled coastal development, the illegal fishing practices and overfishing. Marine pollution generated by oil activities and sewage is affecting the marine environment in Libya only in a limited number of zones. Other threats are reported, in particular: Invasive species (including through ballast waters) coastal sand mining, brine discharged by seawater desalination plants and the use of explosives (dynamite) for fishing.

From 2011, the political circumstances prevailing in Libya are affecting the marine and coastal environment, in particular because of the lack of control by the authorities of harmful practices.

-Biological Parameters

Despite the lack of information describing Libyan waters, the most of marine areas has been recognized and documented as being of high environmental value. The following are key features of Libyan Sea Water

The poor load of nutrients from rivers that drain into the Mediterranean and the infrequent mixing of the water column, together with the fact that waters entering the Mediterranean from the Atlantic do not compensate for the loss of nutrients from this outflow, make the biological productivity of the Mediterranean low. The Phytoplankton Analysis performed identified a typical community of low biomass in summer conditions (nutrient-poor stratified waters) and under the pressure of diversified zooplankton (radiolarians, naked ciliates, tintinnids and copepods present).

Sea grass meadows are an important habitat for many marine species for spawning, breeding, feeding and nesting. In Libya, the Gulf of Sirte is known to present meadows of *P. oceanica*; however, there is a lack of specific updated references of its distribution and status along the coast. In the Gulf of Gabes, *Posidonia* is giving way to *Caulerpa* grass meadows, an immigrant seaweed species from the Red Sea. *Caulerpa* is less demanding with respect to seabed granular structure.

Coral species tend to prosper in association with sea grass meadows. *Corallium rubrum* is a typical species of the Mediterranean, however studies indicate that this species is present on the Tunisian coast and absent along the Libyan coast. Other potentially present coral species associated to the seagrass meadows in Libyan waters are *Telmatactis forskalii*, *Aiptasia diaphana*, *Eudendrium cuninghami*, *Cladocora caespitosa*, and *Balanophyllia europaea*.

Mangroves are not present on the LIBYA, or on the northern shores of Africa on the Mediterranean. Tidal variations are too small to deliver air to the roots as the tides recede.

Many marine invertebrate species, common to the Mediterranean Sea, inhabit Libyan waters as well. A total of 319 macrobenthic invertebrate taxa, belonging to seven different phyla, were identified. The polychaete *Aponuphis bilineata* was the most abundant species in the west part of Libyan waters.

A total of 278 marine species of fish are present in Libyan waters. The highest fish species diversity in the Libyan coastal area is in the eastern region (45.65%, 42 fish species), while diversity in the Gulf of Sirt and western regions average 23.91% (21 species) and 30.43% (28 species), respectively. Several species of fish, mainly sharks, are threatened. The Farwa lagoon and the Abukammash area, on the border between Libya and Tunisia, are known for high fishery productivity.

Three endangered sea turtles are found in Libyan coast : Loggerhead (*Caretta caretta*); Leatherback (*Dermochelys coriacea*); and Green turtle (*Chelonia mydas*). The loggerhead is the most abundant and the only nesting turtle on the Libyan coast; however, its distribution in Libya seems to have been reduced due to fishing activity. The other two species are also becoming increasingly rare.

Libya has a large coastline on the Mediterranean Sea and its lagoons & small islands play an important role in the biodiversity of marine birds in the west region. Key seabird species include the Audouin's Gull (NT) and a small localised population of the endemic subspecies of Lesser Crested Tern (LC) *Sterna bengalensis emigrate*.

With regard to marine mammals, it is known that eight (8) species of cetaceans are present in offshore Libya: Striped Dolphin (*Stenella coeruleoalba*); Sperm Whale (*Physeter macrocephalus*); Risso's Dolphin (*Grampus griseus*); Pilot Whale (*Globicephala melas*); Bottlenose dolphin (*Tursiops truncatus*); Cuvier's beaked whale (*Ziphius cavirostris*); Common Dolphin (*Delphinus delphis*); and Fin Whale (*Balenoptera Physalus*). Four are identified in the IUCN Red List.

Overfishing and invasive species are other threats affecting the region. The main species threatened by overfishing and illegal fishing are: *Anguilla anguilla*, *Epinephelus marginatus*, *Sciaena umbra*, *Thunnus thynnus*, *Xiphias gladius*, *Mullus barbatus*, *Mullus surmuletus*, *Merluccius merluccius*, *Sarda sarda*, some species of cartilaginous fishes, crustaceans as *Homarus gammarus*, *Palinurus elephas* and *Scyllarides latus*, bivalves such as *Lithophaga lithophaga*, sponges (*Hypospongia communis*, *Spongia spp.*) and red coral (*Corallium rubrum*). With regard to invasive species, the number of species has increased significantly since the start of the last century, introduced mainly through two pathways: (i) by maritime transport and fish farming; and (ii) through the Suez Canal. In total, Libya reported 22 exotic species.

Finally, several protected areas are located along the Libyan coast, including two National Parks, four protected areas, and one nature reserve. Additionally, four IBAs are located along the Libyan coast, and two Ramsar sites, both part of the Kouf National Park, are considered important wetlands for migratory and resident water birds.

Policies, and the relevant legal and administrative framework

Local legislation considered relevant for the proposal, as well as the International Conventions and Agreements signed by Libya, are described in the sections that follow.

1-National Legislation

Several Libyan Authorities are responsible for the environmental protection issues related to coast area activities. The Environmental General Authority (EGA) is the main authority of environmental issues in Libya, Law No (38/39) of 1975, concerning municipalities, Libyan nature protection legislation, Law No. 3 of 2001 on Urban Planning and others.

1.1 Maritime Sea Laws & others

The following legal documents address maritime and others issues in LIBYA.

Law No .(8) OF 1973 : PREVENTING MARINE ENVIRONMENT:

It is concerned with implementing the provisions of international conventions to prevent the pollution of sea water with oil issued .

- . Law on the Libyan maritime issued on 28 November 1958.
- . Law on Sea Ports (No 81 / 1971).
- . Law amending certain maritime law provision (62 / 1976).
- . Law on the regulation of marine wealth (14 / 1989).
- . Law on domestic waste (13 / 1984).
- . Law on Fishery resource (14 / 1989).
- . Decision (94 / 1976) : Model Regulation related to Puplic Cleanness .

1.2 LAW N° 8 OF 1955: LIBYAN PETROLEUM LAW

The law covers all petroleum activities(onshore/ offshore) in Libya. The following are notes on some articles related to (E/P) activities:

- *Article 4* regulates that machinery, equipment and materials shall meet the standards of safety and efficiency recognised in the oil industry.
- *Article 13* covers the protection of fresh water-bearing strata during drilling operations by means of casing and cementing.

. Oil and Gas Sector The following legal documents regulate the oil and gas in Libya:

- National Petroleum Law (N° 25 of 1955).
- Law Establishing the Libyan Public Petroleum Corporation (N° 13 of 1968). (As amended).
- Law on the amendment of some rules of the Law of Petroleum N° 25 of the year 1995. ·
- Decision of General Secretariat of the General People's Congress for Re-organizing the National Oil Corporation (N° 10 of 1979).

A number of Environmental Laws define measures to protect the environment, including pollution prevention and elimination. The NOC also publishes several guidelines for the Oil and Gas Industry to promote environmental best practices for off shore and controls oil and gas operations in the territory.

The Libyan legislation provides the legal requirements that any industrial , operator must adhere to when operating in Libya. Therefore, these requirements are statutory and must be followed.

1.3 MASTER EXPLORATION AND PRODUCTION SHARING AGREEMENT, 1989

This agreement states that every reasonable precaution should be taken to prevent damage or hazard as a result of operations to human life, property, natural resources, coasts, cemeteries or places of archaeological, religious or tourist interest or public installations.

1.4-Competent Authorities

Libya is an independent country currently undergoing political reconstruction after the civil war in 2011. Since the end of the Libyan revolution in October 2011, the representatives of local authorities in Libya have apparently not changed. As a result, the EGA continues to be recognized as the authority responsible for environmental issues in Libya. It was established in 1998 following the issuance of the General People's Committee decision no. 263. The EGA, which is an independent body run by a People's Committee, replaced the Technical Centre for Environmental Protection. The Secretary of the People's Committee for the EGA was nominated through decision no. 101 of 1999 , Now follow the prime minister.

The EGA is composed of several offices, which include:

- The Environmental Studies and Research office : Responsibilities include performing EIAs for projects and permitting their implementation if they are not found to be significantly harmful to the environment , So as not to interfere with the legislation related to the target activity after the verification and compliance with the law of environmental protection and its executive regulations also Issuing environmental Guide line and carrying out field studies And follow up on environmental permission.
- The Environmental Monitoring and Inspection department: Responsibilities include inspection and surveillance of pollution sources

to reduce their environmental impact as well as inspection and monitoring of environmental compliance of sectors and facilities and environment-related activities.

- Department of Conservation of Nature : Is responsible for monitoring and monitoring biodiversity in Libya, preparing national biodiversity strategies and action plans in cooperation with relevant national authorities, and is responsible for proposing and monitoring the implementation of national legislation related to the conservation of biological diversity. It also implements and cooperates with the recommendations international and regional organizations.

- Department of Technical Cooperation and Consultancy:

Is responsible for supervising the implementation of the follow-up to the obligations resulting from Libya's signing of international conventions and treaties in the field of environmental in coordination with the Authority's departments and other relevant bodies The Department is also responsible for linking the Environment general Authority with regional and international bodies and institutions for the implementation of joint programs, projects and studies. It also supervises the work of national committees in the field of the environment, and provides technical advices and consultation to other Authority's departments

Under the current environmental legislation stipulated in Law No. 15 , the EGA is responsible for granting appropriate licenses for activities that may cause pollution, and for their subsequent evaluation and monitoring. The law allows the EGA to establish an "environment police" department to undertake environmental inspection.

The Main industry in Libya it's oil & gas , NOC assumes the responsibility for oil and gas sector operations in Libya. Under the Petroleum Regulations (No. 8), the NOC requires concession holders to take every reasonable precaution to prevent damage or hazard, as a result of operations, to human life, property, natural resources, coasts, cemeteries or places of archaeological, religious or tourism interest or to public installations .

Operators interact directly with the NOC on environmental issues through the Environmental Protection Department, which acts as the Chair of the NOC Committee on Archaeology and Environment Committee.

1.5-Libyan Environmental Laws and Guidelines

1.5.1 - LAW N° 7 of 1982 for PROTECTION OF THE ENVIRONMENT (SUBSTITUTED BY LAW N°15, 2003)

In Decree No.386, Chapter 2: Protection of ambient air from pollution

Articles 40-41 regulate the emission of exhaust gas from different type of facilities including ships.

Article 48 gives the right to inspect the facilities to the competent authority.

Articles 44-45 regulate the movement and storage of volatile chemical, and the required license to manage and dispose of it.

The executive regulation via Decree No.386/1428

Articles 50-53 prohibit the discharge of untreated wastewater to the sea, natural drainage channels or groundwater from any facilities or ships and require the wastewater quality to comply with current requirements. All facilities should prepare a monitoring report for the quality of the discharged wastewater every six months to be submitted to the competent authority.

Article 55 states that all facilities should have the approval from the competent authority to operate.

Articles 57, 58, 64, 65 and 66 cover the prohibition of oil spill and the requirements for the use of oil/water separation equipment to prevent the discharge of water containing oil. It also stipulates the organization which has the authority to inspect the facilities.

Article 77 prohibits the discharge of any contaminated material to water resources. In addition,

Article 82 prohibits the discharge of any hydrocarbon contaminated material to the drainage or sewage network.

Article 78 covers the regulation of wastewater treatment and requires the monitoring of treated wastewater quality to be reported every six months to the competent authority.

Article 79 considers treated wastewater as a water resource if it is not contaminated and suitable to be re-used.

Article 80 -81 cover the prohibition to connect industrial or sanitary drainage systems to the sewage network.

1.5.2 - LAW N° 15 OF (2003)

Law no. 15 is the main law for environmental protection in Libya. The environment is defined as the environment in which man and all living beings live, and which includes air, water, soil and food. Law no. 15 sets the framework for environmental protection and defines methods for measuring pollution and planning programmes for pollution elimination. The Law specifies public duties towards preserving the environment in the following fields:

- General Provisions (Articles 1-9)
- Air Pollution (Articles 10-17)
- Protection of Seas and Marine Wealth (Articles 18-38)
- Protection of Water Sources (Articles 39-47)
- Protection of Foodstuffs (Articles 48-50)

- Environmental Hygiene (Article 51)
- Protection from Common Animal Diseases (Article 52)
- Protection of Soil and Plants (Articles 53-55)
- Protection of Wildlife (Articles 56-57)
- Biological Safety (Articles 58-63)
- Penalties (Articles 64-76)
- Final Provisions (Articles 77-79)

The following are notes on some of the Articles that may be particularly relevant to EIA and industry activities.

Article 3 states that public bodies, companies, and individuals must work to limit pollution through co-operation with competent organisations. Any entity causing environmental pollution must take the necessary measures to limit or eliminate pollution.

Article 4 states that the Competent Authority should be informed of any pollution incidents. Operators are to provide response equipment for protection and clean-ups, and must inform the competent authority of all incidents, which may take place due to the practice of their activities.

Article 6 specifies the role of the Competent Authority in 19 items, including the provision of authorisation (permits) and licences for performing activities, which cause pollution. Item 12 states that the Competent Authority will specify operating conditions after reviewing the EIA.

Articles 10 - 17 of this law cover emissions relating to emissions from point sources (e.g., facilities and vehicles). Factories, facilities and plants on trial are excluded from the provisions. All items that contradict the present law, in particular those of the Law No. 7 of 1982 are voided.

Article 16 states that vehicles must pass emissions tests.

Articles 18-38 of this law cover emissions of fuel/oil and other residues from ships and industrial facilities to the Libyan coastal and territorial waters. Disposal of oil or oil mixtures, washing of cisterns, heavy and light oils and bottom water or ballasts drainage are prohibited in Libyan territorial waters. Exceptions include safety and lifesaving purposes, technical damage or unavoidable leakage, oil flowage where the sole alternative is to dispose of it into the sea, provided all precautionary measures are taken to minimise impacts. Notifications are to be done to the seaport authorities in case of disposal of oil or oil mixture by ships at seaports. Disposal of polluted waters into the sea through drainage pipes without prior treatment is prohibited.

Articles 39-47 cover for the management and disposal of hazardous materials affecting water quality. Disposal of toxic materials into water or activities that may affect water quality are prohibited. Disposal of wastewater has to be done according to rules and issued regulations without causing environmental harm.

Article 41 states that *Article 41* states that any user of the water resource should preserve the resource, ensuring that no damage occurs that may hinder its optimal use.

Article 43 defines domestic and industrial wastewater as part of the water resource. Such wastewater shall not be disposed of after treatment unless it is proven that its use is impractical. If disposal occurs, it must not cause environmental pollution.

Article 45 prohibits the pollution of a water source by waste disposal.

Article 56 provides for the protection of wildlife.

Article 57 prohibits hunting without permission from the competent authority.

Article 70 establishes a fines for water source pollution by waste disposal.

A number of laws and decrees relating to the EIA requirements, presenting two levels of EIA study depending on the nature of the proposed activities, and including templates for presenting the two types of studies are in preparation. A proposal for these regulatory texts is available for comments and discussions on the internet. The main aspects of these proposed requirements are presented below:

Articles 3-7: An application form shall be submitted to the EIA department of EGA presenting the proposed project in order to define the type of EIA study required, based on a list of project types in Appendix . EGA should submit its answer within a week of submission of the application form .

Article 8: The EIA study shall be written in Arabic.

Article 9: The EIA should be prepared by an in depended environmental consultant that is registered (approved of) by the EGA.

Article 11: The relevant department of the EGA is required to formally reply within 60 days of the submission date for an EIA, otherwise it shall be considered as approved.

1.6 - LAW Nº 3 OF 1994 CONCERNING THE PROTECTION OF ANTIQUITIES, MUSEUMS, HISTORIC CITIES AND BUILDINGS

Department of Antiquities (DOA) Within the Ministry of Tourism under the Law on Archaeology Law No. 3 is the Libyan instrument that enacts the 'Heritage Convention' (Convention Concerning the Protection of the World Cultural and Natural Heritage). This Law defines an archaeological object as "anything that has been made or manufactured by man and which relates to the human heritage and goes back in time 100 years or more." *Article 1* defines a natural collection as "anything that has connection or pertains to the human race (fauna and race (fauna and flora) as well as geological formations (stones and minerals) that have aesthetic value and tourist potential."

All archaeological material is owned by the state, including mobile and immobile cultural property, whether on the surface or buried (Article 5). It is illegal to destroy or disturb any cultural property or export antiquities for any purpose (Article 8). Without accord from the Department of Antiquities and consideration of the terms set down in the annex of this law, no private or

public organisation is allowed to set up or amend a development plan for a town or village, or to build or to rebuild roads in areas where cultural property is registered (*Article 7*).

The Annex to the Antiquities Law (*Article 6*) states that permission for any construction or development project (housing, industrial or agricultural) which involves disturbance of the ground in archaeological areas may not be given until an archaeological investigation (e.g., survey) has been carried out by or for the appropriate authority (i.e., the Department of Antiquities) on all the affected areas.

1.7 - LIBYAN NATURE PROTECTION LEGISLATION

The first Libyan conservation legislation came into existence in 1949, the Law on Forestry. The objective was to give protection to forests and forest products, to soil, water sources and land under threat of desertification. Subsequently in 1970 the Law for the Protection of Agricultural Land introduced an ordinance on the protection of "green areas".

A specific agreement to set up the first national park was signed and a special decree enacted in November 1978. The national park system was established with specific guidelines for the creation of protected areas, in order to "create meaningful national parks for the Libyan people and international tourism". It also aimed to take positive measures to restore native wild animals in reserves where they have been exterminated.

The main body with jurisdiction of protected areas is the Technical Committee of Wildlife and National Parks, which was created in 1990.

1.8 - Law No. (5) of 1982 Concerning the Protection of Pastures and Forests

This law contains (27) material: Article (1) defines the terms of the law , Article 2: The legal responsibility for the protection of forests , Article (3): Monitoring and enforcement , Article (4-5): Terms of reference of the Ministry of Agriculture and Urban Development of Municipalities , Article (6-16): Forest and Protected Areas Management Regulations, Article (17-19): Controls and prohibition of misuse of forests and pastures , Article (20): Responsibilities of the Ministry of Agriculture for the work on soil stabilization and vegetation cover, Article (21) Procedures for deforest and investment, Article (22) Prohibition of cutting trees and plants threatened with extinction in order to preserve their species, Article (23-27) Penalties.

1.9 - Law No. (15) of 1989 regarding the protection of animals and trees

This law contains (13) articles concerned with the preservation of animals and trees as they are the main sources of the state and must be improved by all Means of interest and development of pastures.

Article 10 The Ministry of Agriculture shall take all measures for the protection and control of animals, trees and forests and shall be entitled to the status of judicial guardianship of workers in the agricultural sector, and the inspectors of agriculture, municipal guards, police, Adjust the crimes and offenses stipulated in this Law.

1.10- Law No. (3) of 2001 Concerning Urban Planning

This law aims to achieve the following:

- Optimal exploitation of economic and human resources spatially.
- Achieving economic and social integration between regional, local and urban plans within Libya.
- Ensure the distribution of the requirements of population growth within the schemes to achieve economic and social parity.
- Optimal use of land and organize its functions for various purposes and the protection of agricultural land from urban crawling.
- Supporting environmental conservation directives
- Contribute to the protection of the environment using scientific methods in the distribution of population and utilities and the organization of services.
- Preserving the natural, archaeological, historical, and tourist attractions and the areas closed to the coast .

Article (25) of the law stipulates that building not be permitted on the lands closed to the seashore. The executive regulation of this law shall specify the appropriate distance and the rules and regulations relating to this article.

Decision of the General People's Committee No. (406) for the year 2009 to issue the executive regulation of law No. (3) for the year 2001 on urban planning.

Article (57) of the Executive Regulations of Law No. 3 of 2001 Concerning Urban Planning:- The protection of the beaches of the sea shall be at least 100 meters

1.11 - Law No. (5) for the year 1969 regarding the planning and organization of cities and villages

Article (4) of the law concerning the use and classification of areas Article (22) The acronym (1) The building permit outside the schemes is not permissible except for utilities and agricultural facilities. Article (2) The building license in the said cases shall be in accordance with the conditions and conditions laid down by the Council of Ministers upon the presentation of the Minister of Municipal Affairs .Article (3) The Council of Ministers may decide to use an area outside the schemes for purposes other than those mentioned in this Article.

Article (22) bis (1)1- It is not permitted, within or outside the plans, to permit building on the land closed to the beaches of the sea, less than 100 meters from the shore boundaries, except for the establishment of projects

designated for tourism purposes, which are established by the government, bodies, institutions and public companies.

2. Subject to the preceding paragraph, each ownership of the lands space within its borders is transferred to the municipalities within the distance referred to in the preceding paragraph, as well as the facilities established within it, and the owners shall be compensated in accordance with the provisions of Law No. 116 of 1977 on the regulation of urban development

1.12 - Law No. 13 of 1984 Concerning the public cleaning

Article (3): Individuals, bodies, institutions, companies, public and private interests, national or foreign, are prohibited for Disposal . or disposing of waste, garbage or garbage in places other than those designated for such purposes. It is also prohibited to Waste disposal , construction waste, chemicals, scrap and dead animals in front of houses ,streets, Forests, On the coast of the sea, and public parks.

1.13 - Law No. (4) concerning the transport of hazardous materials on public roads

The law contains (15) articles concerning definitions of hazardous substances and classification, the legal procedures of the transport process, its conditions, the permissions required for the transportation and the instructions to be followed. Adding penalties to the offenders in the non application of this law.

2. -International Conventions and Agreements

International conventions signed by Libya complete the legal framework. Libya has ratified several regional and international conventions, related to international biodiversity and dealing with marine and coastal conservation, including Ramsar, CITES, Biological Diversity (CBD) and Barcelona Convention. Libya has recently become a party to the Bonn Convention on Migratory Species (CMS) and has acceded to AEWA (the Afro-Eurasian Waterbird Agreement of the Convention on Migratory Species). Many activities for marine conservation in Libya were introduced and still function within the framework of national implementation of those conventions (Birdlife, IUCN). The conventions considered to be of the highest potential relevance to Marine Environment are described below.

2.1- Barcelona Convention

Libya is a contracting party of the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention).

In the framework of the Regional Seas Program of UNEP, the Mediterranean Action Plan (MAP) was adopted in 1975 by 16 Mediterranean countries and the European Union (EU), with the main objectives to assist the Mediterranean countries to:

- a. Assess and control marine pollution;
- b. Formulate their national environment policies;
- c. Improve the ability of governments to identify better options for alternative patterns of development; and
- d. Optimize the choices for the allocation of resources.

The Barcelona Convention was adopted in 1976 by 16 Mediterranean countries and the EU, which are each party to the MAP. The 1976 Convention was amended in 1995. There are seven Protocols addressing specific aspects of the Mediterranean environment that complete the MAP legal framework.

They are:

- a. The Dumping Protocol;
- b. The Prevention and Emergency Protocol;
- c. The Land-Based Sources and Activities (LBSA) Protocol;
- d. The Specially Protected Areas and Biodiversity Protocol;
- e. The Offshore Protocol;
- f. The Hazardous Wastes Protocol; and
- g. The Integrated Coastal Zone Management (ICZM) Protocol.

The main objectives of the Barcelona Convention are to:

- a. Assess and control marine pollution;
- b. Ensure sustainable management of natural marine and coastal resources;
- c. Integrate the environment in social and economic development;
- d. Protect the marine environment and coastal zones through the prevention and reduction of pollution and as far as possible, the elimination of pollution, whether land or sea-based;
- e. Protect the marine environment and coastal zones through the prevention and reduction of pollution and as far as possible, the elimination of pollution, whether land or sea-based;
- f. Strengthen solidarity among Mediterranean coastal states; and
- g. Contribute to the improvement of the quality of life.

The Med Pol Program and six (6) Regional Activity Centers are responsible for the implementation of the Marine Action Plan.

The Offshore Protocol was adopted in 1994 with the aim of complementing the Barcelona Convention as regards exploration and exploitation activities. The Convention establishes a structure applicable to the Mediterranean Sea

Area, including the continental shelf and the seabed and the subsoil. The Protocol allows the contracting parties to extend its operability to wetlands and coastal areas, in addition to internal waters. The Protocol covers a variety of activities.

2.2 -International Convention for Prevention of Pollution from Ships (MARPOL)

The International Convention for the Prevention of Pollution from Ships (MARPOL) is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes. It was adopted on 2 November 1973. A Protocol was adopted on 17 February 1978 in response to a spate of tanker accidents in 1976-1977 and another one was adopted in 1997 to amend the Convention and add a new Annex IV "Regulations for the prevention of air pollution from ships", which specifies the surveys and inspections that ships must undergo, and the issue of International Air Pollution Prevention Certificates.

This Convention has five Annexes that give detailed technical specifications regarding the way in which a ship must be built and equipped to prevent major pollution of the marine environment in case of accidents, and also norms and technical requirements to minimize operational discharges. The five Annexes are for oil, chemicals in bulk, packaged chemicals, liquid sewage, and garbage. The Convention was signed by Libya on 28 April 2005. In Annex I Prevention of pollution by oil, Annex II Control of pollution by noxious liquid substances, Annex IV Prevention of pollution by sewage from ships and Annex V Prevention of pollution by garbage from ships, MARPOL defines certain sea areas as "special areas" in which, for technical reasons relating to their oceanographic and ecological condition and to their sea traffic, the adoption of special mandatory methods for the prevention of sea pollution is required. Under the Convention, these special areas are provided with a higher level of protection than other areas of the sea. The Mediterranean Region is a Special Area under MARPOL Annex I (Oil) and Annex V (Garbage) since 1973.

2.3 -Convention on Biological Diversity (CBD)

The Convention on Biological Diversity (CBD) was adopted by the Intergovernmental Negotiating Committee for a Convention on Biological Diversity, during its Fifth session, held in Nairobi from 11 to 22 May 1992. The Convention was open for signature at Rio de Janeiro by all States and regional economic integration organizations from 5 June 1992 until 14 June 1992, and remained open at the United Nations Headquarters in New York until 4 June 1993. It entered into force in December 1993 and Libya became a party in 2001.

The CBD has three objectives: 1) the conservation of biological diversity; 2) the sustainable use of its components; and 3) the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

The Cartagena Protocol on Biosafety, a feature of the CBD also accessed by Libya, entered into force in 2003. The Protocol sets out a comprehensive

regulatory system for ensuring the safe transfer, handling and use of living modified organisms (LMOs), with a specific focus on regulating movements of these organisms across national borders.

Summary of Global Environmental Agreements and Conventions

These conventions are not specific to (EO 7 / EO 8) but guide specific areas of environmental management in Libya and therefore are relevant to the activities carried out in the general context of coast activities.

Convention on Preservation of Fauna and Flora in their Natural State (London, 1933)

The Convention on Preservation of Fauna and Flora in their Natural State considers that the natural fauna and flora of certain parts of the world, and in particular of Africa, are in danger, in present conditions, of extinction or permanent injury. This convention desires to institute a special regime for the preservation of fauna and flora; considering that such preservation can best be achieved (i) by the constitution of national parks, strict natural reserves, and other reserves within which the hunting, killing or capturing of fauna, collection or destruction of flora shall be limited or prohibited, (ii) by the institution of regulations concerning the hunting, killing and capturing of fauna outside such areas, (iii) by the regulation of the traffic in trophies, and (iv) by the prohibition of certain methods of and weapons for the hunting, killing and capturing of fauna. On the 14th January 1936, all the nations of Africa (as a whole) entered into this convention.

2.4 - African Convention on the Conservation of Nature and Natural Resources (Algeria, 1968)

The objective of the African Convention on the Conservation of Nature and Natural Resources is to encourage individual and joint action for the conservation, utilization and development of soil, water, flora and fauna for the present and future welfare of mankind, from an economic, nutritional, scientific, educational, cultural and aesthetic point of view. This convention was accepted in 1968 and ratified on 16th July 1969.

2.5 - International Convention on Civil Liability for Oil Pollution Damage (1969, 1992)

The Civil Liability Convention was adopted to ensure that adequate compensation is available to persons who suffer oil pollution damage resulting from maritime casualties involving oil-carrying ships. The Convention places the liability for such damage on the owner of the ship from which the polluting oil escaped or was discharged. The Convention applies to all seagoing vessels actually carrying oil in bulk as cargo, but only ships carrying more than 2,000 tons of oil are required to maintain insurance in respect of oil pollution damage. The Convention covers pollution damage resulting from spills of persistent oils suffered in the territory (including the territorial sea) of a State Party to the Convention. It is applicable to ships which actually carry oil in bulk as cargo (i.e. generally laden tankers). Spills from tankers in ballast or bunker spills from ships other than other than tankers are not covered, nor is it possible to recover costs when preventive

measures are so successful that no actual spill occurs. The ship owner cannot limit liability if the incident occurred as a result of the owner's personal fault. The 1969 Convention (CLC 69), ratified by Libya, has been replaced by its 1992 Protocol as amended in 2000 (CLC 92). Libya has not ratified the CLC 92. As of September 2007, CLC 69 is in force in Libyan waters, rather than CLC 92.

2.6 - Convention on Wetlands (Ramsar, 1971)

The Convention on Wetlands is an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. It was adopted in ERM 21 ENI NORTH AFRICA BV the Iranian city of Ramsar in 1971 and came into force in 1975, and it is the only global environmental treaty that deals with a particular ecosystem. The Convention's member countries cover all geographic regions of the planet. The convention was ratified by Libya on the 13th June 2000.

2.7 - Convention on International Trade in Endangered Species of Fauna and Flora (CITES Washington, 1973) CITES,

the Convention on International Trade in Endangered Species of Wild Fauna and Flora, also known as the Washington Convention, was negotiated in 1973 when it was realized that international trade in wildlife and wildlife products could lead to the over-exploitation of certain species, thus threatening them with extinction. CITES entered into force in Libya on the 28th of April 2003.

2.8 - Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 1979)

The Bonn Convention was signed in Bonn in 1979. Some of the key issues addressed by this convention include species and habitat conservation, management of human activities, research and monitoring, education and information, and implementation. Bonn 1979 came into force in Libya on the 1st of September 2002.

2.9 - Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel, 1989)

Because hazardous wastes pose such a potential threat to human health and the environment, one of the guiding principles of the Basel Convention is that, in order to minimize the threat, hazardous wastes should be dealt with as close to where they are produced as possible. Therefore, under the Convention, transboundary movements of hazardous wastes or other wastes can take place only upon prior written notification by the State of export to the competent authorities of the States of import and transit (if appropriate).

The Basel Convention contains specific provisions for the monitoring of implementation and compliance. A number of articles in the Convention

oblige Parties (national governments which have acceded to the Convention) to take appropriate measures to implement and enforce its provisions, including measures to prevent and punish conduct in contravention of the Convention. On July 2001, Libya entered into the accession stage for this Convention, but has not yet ratified it.

2.10 -International Convention on Oil Pollution Preparedness, Response and Cooperation (London, 1990) Parties to the OPRC

convention are required to establish measures for dealing with pollution incidents, either nationally or in co-operation with other countries. Ships are required to carry a shipboard oil pollution emergency plan to be developed by IMO. Operators of offshore units under the jurisdiction of Parties are also required to have oil pollution emergency plans or similar arrangements which must be co-ordinated with national systems for responding promptly and effectively to oil pollution incidents. Ships are required to report incidents of pollution to coastal authorities and the convention details the actions that are then to be taken. The convention calls for the establishment of stockpiles of oil spill combating equipment, the holding of oil spill combating exercises and the development of detailed plans for dealing with pollution incidents. The Convention entered into force in Libya on September 18th, 2004.

2.11- Framework Convention on Climate Change (FCCC)

The FCCC was endorsed during the United Nations Conference on Environment and Development (UNCED, or the Earth Summit) held in Brazil, 1992. It came into force on 21 March 1994. Under the convention, developed countries are required to take measures aimed at returning emissions of greenhouse gases (in particular carbon dioxide) to 1990 levels by the year 2000, and to provide assistance to developing countries.

The Kyoto Protocol under the FCCC was agreed in December 1997. It imposes legally-binding targets on industrialized countries to reduce overall emissions of greenhouse gases by at least 5% below 1990 levels in the budget period 2008 to 2012. Libya has signed, but not yet ratified, this protocol.

2.12 - Stockholm convention on Persistent Organic Pollutants (POPs)

is a global treaty to protect human health and the environment from chemicals that's remain intact in the environment for long period .

The convention was adopted in May 2001 in Stockholm , Sweden and entry into force on 17 May 2004 , more than 170 countries have ratified the convention up to date. LIBYA becoming a party on 14 June 2005 by accession and entry into force on 12 September 2005.

The international agreements for the sound management of chemical to which Libya had acceded and became party include:

- Stockholm Convention on Persistent Organic Pollutants (POPs) signed by Libya in 2005,
- Rotterdam Convention (UNEP/FAO 1989) on the Prior Informed Consent (PIC) Procedure for certain Hazardous Chemicals and Pesticides in International Trade signed by Libya in 2002.

- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal signed by Libya in 2001.
- Minamata Convention on Mercury Signed by Libya in 2013

There are large amounts of waste containing waste materials, the estimation of the quantities of POP/PCB/Mercury stockpiles in Libya as follows:

Pesticide wastes situation in Libya.

In 2008, the surveying on the existing expired pesticides carried out from the Agriculture, Maritime and Animal Resources throughout the country indicated the presence of 386.98 Tones existing expired pesticides. The table below gives the locations and quantities of obsolete pesticides in 2008

Locations and Quantities of Pesticides Damaged (2008)

Regions	Quantity (Tons)
The North -West	
Zawya	17.4228
West Mountain	1.4
Abu-shiba Agriculture Project	1.251
Sobrata	23.1353
Tajora	14.436
Jafarah	1
Tripoli	107.821
Zwara	0.075
Mezda	1.24
Alazizia	50
Surman	0.024
Nalout	38.664
Total	256.1059
The North -East	
Elmerg	4.87
Derna	18.204
Green Mountain	3.703
Total	26.687

The South -East	
Morzoeq	1.3065
Ghat	10.42
Wadi Alshatti	20.91
Wadi Alarial	10.2
Total	42.8365
The South- West	
Northern Sarier	0.994
Southern Sarier	4.067
Oasis	10.823
Total	17.884

Source: National Programme for inventory Pesticides Damaged 2008-2009

In 2016 the Environment General Authority has done a survey to some these locations. The information obtained in below table.

Table includes the POP's and other dangerous wastes

No	POP's waste	Quantities (mt)
1-	PCB's	
	PCB's Oil	2017.5
	PCB's in Transformers (57)	50.1
	PCB's in Condensers (153)	1.11
	Polluted Soil	10 (approximately)
2-	pesticides	
	A -POP's pesticides	
	a- Lindane	40
	b- Lindane mixed with bran (5-7 %)	55
	c- DDT	0.21
	B -Unknown pesticides	43.0 (estimated)
	C -NON POP's Pesticides	110
	D -Remains of mixed and burned Pesticides	Estimated to be 20
3-	PFOSA salts (fire fighting foam	Estimated to be 50.

	((AFFF)))	
4-	PBDPs in Waste Electronic Plastic Structure	Estimated to be 70.
5-	PBDPs in Waste Vehicles Furniture.	Estimated to be 100.

PCBs wastes Situation in Libya:

There are large amounts of waste containing these materials, especially in old electric transforms and capacitors. Surveys done by EGA in 2005 and 2008 showed presence of large quantities of oil and equipment containing PCPs.

The below table indicating Old transformers, capacitors, and other materials in the visited sites:

Locations	Number of Old transformers	Numbers of Capacitors	Numbers of drums Containing PCBs Oil
Sdadda	200 Big size	150	
Harouge Oil Terminal (Ras-Lanuf).	8 big size & 14 small size old transformers		16 drums containers of capacity 200liters
Sirte Oil & Gas Exploration & Production (Brega)	20 Big Size		15 containers(size 200liters)
Ghani Oil Field	2		
El-Enma Pipes Company(Benghazi)	2		
Laden Foam Company (Musrata).	1		
General Chemical Industry(Abokamash)	2		

Mercury wastes Situation in Libya:

The quantities of waste mercury not estimated in all locations. Only one place in survey 2008 was visited is Abukamash General Company for Chemical industries. It

using mercury cell to produce chlorine used in VCM (Vinyl chloride monomer) generate mercury compound wastes. The total quantity was 27kg .

3. National institutions and organisations

There are many institutions and bodies related to its work to protect the environment in Libya. Through common ground, especially in the environmental monitoring of marine and coastal environment. Which can play a role in the implementation of the IMAP program in Libya. These are:

3.1 - Libyan Centre for Remote Sensing and Space Science (LCRSSS)

The LCRSSS was established in 1989 according to the Law No. 244. Its main mandate is (i) to use remote sensing techniques for the monitoring of natural resources and elaborating maps, (ii) to ensure seismological watch and (iii) undertake astronomical observation programmes. It has offices in three cities:

- Remote Sensing Office (Tripoli)
 - Seismological Observatory Office (Gharyan)
 - Astronomical Science & Observatories Office (Benghazi)
- The Center can provide modern or old satellite images or express images specific to the history of in advance (for use in the follow-up of fires, floods or any phenomenon), as requested, based on the resale agreement with Airbus satellite owner of Spot satellite and Pleiades satellite.
- Photos available in the center free satellite images Land Sat 30m, how much more can be obtained for a financial amount. satellite images (Spot 5) Distinctive capacity 5 m & 2.5 m, satellite images (Spot 6) Distinctive capacity 1.5 m, (Pleiades) satellite imagery Distinctive capacity 50 cm.
- With regard to the specialists of the Center there is a staff of engineers and experts with long experience in the field of remote sensing and geographic information systems and can through the agreements concluded with a lot of international and Arab agencies to help them to complete any regional or international project.

- Main studies involving monitoring in relation to environment

Name of Study	Implemented by
Study of land degradation and deforestation on the eastern coast of Tripoli using remote sensing techniques and GIS (2010-2013)	LCRSS
Study of the shortage of forests in the Greater Tripoli between 1978 and 2015 using remote sensing techniques and GIS	LCRSS
Using Geo-techniques information system for study and follow-up the coastal environment of north-western Libya from the period (1992-2009)	LCRSS

3.2 - Marine Biology Research Centre (MBRC)

The MBRC was established by the Act No. 1582/1981. It is located on the coast of Tajura (15 km east of Tripoli). (MBRC) was established in 1981 and in 1984, the integration of Marine Fishing Research Center with (MBRC) in order to unify the experience and benefit from the experiences. In 2002, the center's branch was opened in Benghazi city in order to activate the role of the center in following up all activities .Its main missions are:

- To conduct studies and field surveys of marine living and non-living habitats and resources,
- To provide technical advice and consultation on marine wealth issues,
- To publish the results of carried out studies and findings in various media types,
- To cooperate with national, regional and international similar institutions and organizations through organization of joint research projects
- To organize symposia and conferences and exchange information.

- **Existing programmes, networks or initiatives of relevance for environmental monitoring :**

There is no monitoring network for the coastal marine environment in Libya. However many studies and surveys were undertaken before 2011.

Lists of the main documented surveys involving monitoring of pollution parameters, marine turtles, sea birds and non-indigenous species are presented in the following tables.

3.3 - Department of Zoology at the Faculty of Science at the University of Tripoli

Since the establishment of the Department of Zoology at the Faculty of Science / University of Tripoli in 1957, various studies have been carried out on wild animals. Moreover, several studies have been conducted on the biodiversity of the western coastal region, such as Farwa Island and the adjacent coastlines. More recently, there has been a growing interest in Ecology and environmental programs, especially on biodiversity and conservation. The most important programs are the establishment of graduate projects and master's researches, especially on the coastal habitats. Zoology Department has organized scientific field trips to study the biological diversity of Al-Jabel Al-Akhdher region during the years from 1995 to 2010, these studies aimed to monitoring the biodiversity of the region, especially coastal areas. Over the past two years, the program has been reactivated to target the western coastal region which extended from Alkhoms to Misurata. However, the Department of Zoology at the Faculty of Science at the University of Tripoli has many contributions in the field of studying and monitoring the environment and biodiversity. Furthermore, the specialists are working in collaboration with national authorities and research centers in the field of protection and monitoring of biodiversity. For example, the Environment General Authority (EGA), Marine Biology Research Center and some non-governmental organizations (NGO's) in Libya.

3.4 - Non-Governmental Organisations (NGOs)

Several non-governmental organizations are active in Libya's environmental sector; few, are participate in regular environmental monitoring procedures, as most non-governmental organizations do simple work that can not provide a series of useful data for environmental monitoring. Most organizations are involved in environmental awareness and initiatives Related to environmental sanitation and participation in hygiene campaigns and some surveys related to the monitoring and follow-up of migratory birds , protection of turtles , protection of Natural Site and Sustainable Development .

There are many of these active organizations:

Libyan Oceanography Society
Libyan Biological Society
Artisanal Fishery Friends Society
Libyan Society for Birds
Al-Hayat Society for Wildlife and Marine Biology
Libyan Wildlife Trust
Libyan Society for Environment Friendly
The Libyan Environmental protectors
Environment Friendly Society

4 - Existing programmes, networks or initiatives of relevance for environmental monitoring

There is no monitoring network for the marine environment in Libya. However many studies and surveys were undertaken before 2011.

Lists of the main documented surveys involving monitoring of pollution parameters, marine turtles, sea birds, marine ecosystem and non-indigenous species are presented in the following tables.

Concerning fisheries, the most recent assessments and monitoring initiatives of fishery resources in Libya were undertaken within the framework of the FAO/MedSudMed Project. Data about spatial distribution, abundance indices, nursery and spawning areas were collected for two important commercial fish species in the area *Merluccius merluccius* and *Mullus barbatus*.

Main studies involving monitoring in relation to pollution

Name	Date	Description
Study of marine plankton Tripoli area (Tajura)	2006	Study the diversity of marine plankton to identify the species of zooplankton and phytoplankton and determine its presence variation during the year water Tajura coast
Study of marine plankton Tripoli area (Gergarash)	2006	The study to identify the groups and species of zooplankton and phytoplankton, identify and classify them during the seasons
Study of bacterial pollution caused by sewage water into the sea in the cities of Misurata and Al-Gomas	2007	Study of bacterial pollution caused by the sewage water level untreated into the sea in the cities of Misurata and Al- Gomas, which can be use the results as a database for the interpretation of some environmental phenomena that may occur in the future
Microbiological study of the effects of the sewage water on the coastal area of Tripoli	2008	Study the effect of sewage water into the coastal water of Tripoli, order to know the impact on the ecosystems and health
Pollution by hydrocarbons	1981	The spread of petroleum hydrocarbons dissolved on the Libyan coast
Pollution by oil	1993	Study the melting and the spread of oil Oil western coasts of Libya
Heavy metal mercury in mollusks	1994	The concentration of heavy metal mercury in mollusks (cephalopods) caught from the Libyan coast.
Industrial pollution in the western region	2001	Study of industrial wastewater impact on the marine environment corresponding to the compound Abo-Kemash Chemical Industries
Chemical and physical characteristics study	2001	Study of the chemical and physical characteristics Al-bompa Bay in the Eastern region of the Libyan coast
Heavy metal in the western Libyan coast	2005	Study of the concentration of total petroleum hydrocarbons in the species (<i>Patella coerulea</i> L) of Gastropoda in the western coast of Libya
Oil pollution in the	2005	Study of oil pollution to some lakes in the Eastern

eastern region		region of Libya
Impact of sewage water in eastern region	2007	Study of the chemical and physical effects of sewage water on the coast of Qaminis to Deriana Benghazi
Environmental study of Farowua Lake	1990	Environmental study of Farowua Lake: sectoral distribution and histological analysis of sediment particles sizes and Estimating organic matter, bacteria, organic nutrition bottom sediments
Environmental study of salt marshes (Abokamash)	2005	Study the reproduction characteristics and cycle life of Artemia in salt marshes (Abokamash), and Artemia characteristics and identify some species of algae
Coastal zone management in Libya	July 2000	By ; Atig A. Drawil – Huni and Hassan M. Howege
Coastal Zone Management in Libya.	July 2000	Comprehensive study prepared on behalf of Technical center of Environment protection, Tripoli, Libya and support by UNEP/MAP, Athens, GreeceBy : Atig Huni and Hassan Howege
Promotion of the sustainable development Indicators in the Mediterranean , Libya	2002	By Mohamed Alwar , Plan Blue ,RAC
Report of MSM Libya 2010 Acoustic Survey Libyan continental shelf	06 August-02 September 2010	MedSudMed Component on “Small Pelagic Fish: Stock Identification and Oceanographic Processes Influencing their abundance and distribution”
Habitat suitability modelling for a key lessepsian fish species (<i>Sardinella aurita</i>) in the Central Mediterranean sea	2010	Over the last decade, there has been increasing interest in the application of habitat suitability modelling in fisheries science This type of modelling approach links species location information to environmental data
Phytoplankton Distribution in offshore and near coast of Libya	2010	Phytoplankton are constitute by minute organisms but they are a key component of the oceanic ecosystem. Some algae are known to produce stable lipid compounds which can be used as a tool to evaluate paleoclimatic changes.
Report of Oceanography data	2008	view the offshore and inshore Libyan waters in the Gulf of Sirt Prepared by MBRC - Libya
Pollution of the sea beaches Tripoli in Municipality	2005	Survey of the pollution of beaches, their sources, impact on the coastal environment, estimate the percentage of pollution.
Survey on the Pollution of the Beaches from the Guatroman Area to Sayad Area (Tripoli)	2006	Study the causes and source of pollution and the volume of pollution in cooperation with the(LCRSSS) under supervision EGA

Monitoring programmes for seabirds ,sea turtle and other species in the Libyan coast

Monitoring programme name	Description of monitoring programme	Implementing Agency
Plan of Action to Address Bird Trapping Along the Mediterranean Coasts of Egypt and Libya	It is an action plan to manage and reduce trapping and illegal killing in Libya and Egypt	EGA and LSB
Monitoring of birds during breeding	It is an activity for monitoring birds during season in some potential breeding sites.	LSB
Ringling program for Mediterranean Lesser Crested Terns <i>Thalasseus bengalensis</i> emigrates	Ringling to collect the information about the population during migration, as well as to follow the three different colonies in Libya	EGA
Libyan Sea Turtles Conservation Program	Since 2005, the Libyan Seaturtle Program (LibSTP) was launched by the Environment General Authority in Libya (EGA) to monitor of the most important nesting beaches in order to protect beaches, nesting females and hatchlings and to determine eco-biological parameters necessary for any conservation activity (importance of nests, density of nests and hatching and emergence rates.	EGA
Report of the MedPosidonia Project Libya 2009	Project to develop the inventorying ,mapping & monitoring of Posidonia meadows in Libya	EGA UNEP,MAP,RAC/SPA
National Report of Ecosystem Approach 2013	Collecting data related to biodiversity in most of Libyan country and assess the data to how make approach	EGA RAC / SPA
Med Key Habitats 2013 - 2016	The project aims to create a plan for the development of marine habitats of importance in the Mediterranean Sea for the purpose of expanding the special protection areas	EGA UNEP,MAP,RAC/SPA

- **Available equipment**

There is no reliable information about the state of the equipment that was available in Libya After 2011 for undertaking field surveys in the marine environment.

- **Databases and Information Systems**

There is Partially Information System in Libya for the parameters covered by IMA. However, data series about pollutants and non-indigenous species are available at EGA and scientists from the Libyan universities.

- **Capacity analysis in relation to IMA Indicators(E07/E08)**

All the monitoring activities undertaken by the national organisations in relation to the marine and coastal environment were stopped during the Six last years. All the international organisations working on environment and nature conservation stopped their activities in Libya. It is not possible to predict how the situation will evolve in the country in the near future.

Indicators	
<ul style="list-style-type: none"> • Location and extent of the habitats impacted directly by hydrographic alterations (EO7) to also feed the assessment of EO1 on habitat extent; • Length of coastline subject to physical disturbance due to the influence of man-made structures (EO8) to also feed the assessment of EO1 on habitat extent • Candidate Indicator: Land use change (EO8) 	<p>NATIONAL INSTITUTION/ORGANISATIONS</p> <p>Libyan Centre for Remote Sensing and Space Science (LCRSSS) Environment General Authority Marine Biology Research Centre Department of Urban Planning</p> <p>AVAILABLE DATA AND INFORMATION</p> <p>There are maps of Posidonia meadows for the areas of Ain Ghazala, Bomba, Garabulli and the Farwa Lagoon These maps and the related documentation are held by the Biodiversity section of the Environment General Authority , Biological Parameters are also is available in EGA. Environmental Base line survey studies for marine Oil concessions is available in EGA</p> <p>AVAILABLE EQUIPMENT</p> <p>Partially available</p> <p>DATABASES AND INFORMATION SYSTEMS</p> <p>Partially available</p> <p>PRIORITY: THESE INDICATORS ARE CONSIDERED AS LOW PRIORITY IN LIBYA</p>

5. - STAKEHOLDER ENGAGEMENT

INTRODUCTION :

This proposal provides a discussion on stakeholder participation through a stakeholder engagement workshop (during the workshop, the program of work, priorities, Available possibilities and impact on coastal area issues and targets) and outcomes will be identified for key stakeholders. Participation activities and responsibilities will be defined during the program of IMAP.

Participatory tools are reported through the development of the consultations and their results to form the basis of the data received, including linking issues with stakeholders and improving stakeholder engagement plan. The plan developed at the workshop should be included as a reference

5.1 OBJECTIVES OF STAKEHOLDER ENGAGEMENT

Stakeholders are defined as individuals, organisations or communities with a stake in the program, ie those who will be directly or indirectly affected by the activities, and/or who have the ability to impact on the coastal activities.

Stakeholder engagement involves identifying and consulting stakeholders, and building external and internal understanding and relationships.

Stakeholder engagement is a key component of an EIA and in IMAP decision making.

The objectives of engagement can be summarized as:

- Provide timely information on potential environmental impact of Breakthroughs and their impact on the coastal ecosystem;
- Identify issues and spatial concerns at an early stage of coastal project planning
- Managing unrealistic expectations and correcting misconceptions about the importance of coastal area conservation through dialogue;
- Develop mechanisms to build community relations and mutual trust with respect to current and future coastal area activities;
- Facilitate the collection of basic environmental data;
- to verify the significance of predicted environmental and their aspects;
- to inform the development of appropriate mitigation measures; and
- Verification of the granting of licenses and approvals and their compatibility and legislation in force

5.2 STANDARDS FOR STAKEHOLDER ENGAGEMENT

No formal requirements exist for stakeholder engagement in Libya, other than the requirement to engage with the relevant regulatory bodies..

The World Bank's guidelines for stakeholder engagement are one of the international criteria for environmental impact assessment They can be guided. The WB guidance is mainly included within its guidelines for EIA. The WB guidelines serve as the international standard for stakeholder engagement; however, local conditions will influence the actual processes to be adopted for engagement for IMAP.

5.3 Identification of Stakeholders

Stakeholders can generally be assigned to the following main categories.

- National Government : These stakeholders are of primary political importance to the project and the IMAP. They include relevant ministries and authorities.

- District and local government bodies: Municipalities and local governance. These include bodies held at the district and local level, and the Offices hom responsible for approval / permission.
- Directly affected and neighbouring communities: These are temporary or permanent communities inside and outside the project area that may receive impacts (positive or negative) as a result of the program activities.
- National and local organizations : These are non-governmental organizations (NGOs), academic institutions (eg universities), community based organizations (CBOs)that it's relation with direct interest in the project, and which may have useful data or insight into any local and national issues raised by the program.
- International organisations: These are organisations based within and outside Libya with an interest in the program . These include NGOs, UNEP,MAP,PAP/RAC,...
- Other interest groups. These include, for example, media.

Table : summarises the proposal list of stakeholders identified by the inventory of IMAP task in LIBYA. these list should be considered an initial assessment of potential stakeholders and their interest only.

Table 1.1 Identify the stakeholders involved in the IMAP

NO	Stakeholder
1	National Government Environmental General Authority Ministry of Agriculture Ministry of Tourism Department of Urban Planning National Oil Corporation
2	District Government All the municipalities close to the coastal Licensing Department City Guard Agricultural Police
3	Non-governmental Organisation Friends of Environment Friends of Biodiversity
4	Research Institutes/Universities Marine Biology Research Centre Centre for Remote Sensing and Space Science Tripoli University , Department of Zoology Post-graduate Academy , Department of Environment Tripoli & Benghazi .
5	International Organisations

Libyan

Cost estimates (x1000 US\$)

Indicators	Baseline data ¹	Equipment ²	Surveying/sampling/Date analysis cost ³
1. Location and extent of the habitats impacted directly by hydrographic alterations (EO7) to also feed the assessment of EO1 on habitat extent; 2. Length of coastline subject to physical disturbance due to the influence of man-made structures (EO8) to also feed the assessment of EO1 on habitat extent 3. Candidate Indicator: Land use change (EO8)	35		15

- ¹Cost of acquisition of base line data for the reference sites
- ²Cost of additional equipment
- ³Cost of the regular monitoring according to the IMAP cycle

Notes on Cost estimates;

1. It's include Baseline data budget cost if satellite images Land Sat 30m, how much more can be obtained for a financial amount, aerial surveys images cost depend on the type of images request .
2. Equipment cost is not specified It is an estimation process and can't be determined until prepare **scope of work** .
3. Regarding Surveying/sampling/Date analysis, does it include expert GIS staff cost for GIS data elaboration?
-NO, other experts "eg. geographic expert, Representatives from urban planning , ecologist , Statistical expert,.....

4. Provide data that is compatible with other monitoring programs that can reduce costs.

Location and extent of the habitats impacted directly by hydrographical alterations

A. Institutional and regulatory aspects

- LAW N° 15 OF (2003)

Law no. 15 is the main law for environmental protection in Libya. The environment is defined as the environment in which man and all living beings live, and which includes air, water, soil and food. Law no. 15 sets the framework for environmental protection and defines methods for measuring pollution and planning programmes for pollution elimination.

- Article 18-36 is related to the protection of marine wealth , habitats and pollution, It aims to achieve the principles of biodiversity conservation EO1 more than hydrographical indicator.
 - Article 37 has a direct relationship with hydrography.
 - Addition ; Decree No. (448) for the year 2009 to issue the executive regulations of Law No. 15 on the protection and improvement of the environment , Article '38' It is prohibited to carry out installations on the beaches that may cause pollution in the marine environment or alteration in marine currents or cause erosion or deposition in a neighboring area , Unless measures are taken to protect that area and These measurements shall be adopted by EGA. The competent authority determines the protection of areas exposed to natural erosion by decision of the prime minister.
 - *Article 6* specifies the role of the Competent Authority in 19 items, including the provision of authorisation (permits) and licences for performing activities, which cause pollution. Item 12 states that the Competent Authority will specify operating conditions after reviewing the EIA.
 - All marine infrastructure are subject to Environmental Impact Assessment (EIA) requirements. The EIA study is determined based on the environmental screening report and includes information on the project and information on the project site.
A study is required based on the results of the environmental screening report , Depends on the privacy of the project or the privacy of the site.
There is a regulation of environmental impact assessment studies, including procedures, definitions , screening forms, a list of contents and lists of activities.
 - Law N°.(8) OF 1955: Libyan Petroleum law. covers all petroleum activities(onshore/ offshore)
 - Law No .(8) of 1973 : Preventing Marine Environment.
 - Law No . (14) of 1989 : Marine Wealth.
- These indicators are considered as low priority in Libya.
 - Weak of environmental information related to infrastructure for old marine ports.
 - Most of the recent coastal facilities during the past ten years have been documented and evaluated environmentally by EGA, through EIA study.
 - Several studies related to the marine environment can contribute directly or indirectly to the monitoring and assessment of hydrographical alterations.

B. Scientific aspects

I. Parameters or element subjects to monitor ;

General values.

Category	Valued Monitor	Importance
Physical Parameters of Environment	Climate Condition	Link to climate change
	Air Quality	Link to human / faunal health
	Seabed substrate	Geomorphological features of interest, geological stability, substrate to benthic ecosystems
	Marine water quality	Link to human / faunal health
	Sediment quality	Link to faunal health
	Coastal Ecosystems	Link to human activities and habitats
Biological Parameters of Environment	Plankton	Sustainability issues and fisheries
	Seagrass	Importance to biodiversity value
	Coral Reef	Importance to biodiversity value
	Invertebrates	Sustainability issues and fisheries
	Benthic Fauna	Sustainability issues and fisheries
	Marine Mammals	Importance to biodiversity value
	Marine Birds	Importance to biodiversity value
	Marine Turtles	Importance to biodiversity value
	Fish communities	Sustainability issues and livelihoods
	Protected Areas	International, National and Community value

The physical characteristics to be monitored are considered to be: bathymetric data, seafloor topography, current velocity, wave exposure, turbulence, and turbidity, temperature , salinity and suspended sediment loads ,.....).

II. Methods and protocols including quality assurance/ quality control

Methods;

- Satellite products services can provide area wide near-real time data.
- Use of autonomous devices or scientific vessels allowing high-resolution data collection.
- Use of numerical circulation and ecosystem models to characterize the conditions over the large sea areas and to forecast local changes due to direct human impacts.
- global or regional operational oceanographic observing systems that provide marine forecasts, can also be part of the ecological Objective 07 monitoring.
- Basin-wide assessment of hydrographical changes and local status reports can provide valuable information on long-term change.
- EIA, SEA and Maritime Spatial Planning MSP, one of the tools

- **Methodology for indicator calculation**
- (i) Mapping of area where human activities may cause permanent alterations of hydrographical conditions (using i.e. existing EIA, SEA and Maritime Spatial Planning –MSP)
- (ii) Mapping of habitat of interest (broad habitat types or other habitat types) in this area of hydrographical changes.
- (iii) Intersection of the spatial map of the areas of hydrographical changes with spatial maps of habitats to determine the areas of individual habitat types that are impacted directly by hydrographical changes.
- **ICZM Protocol**

Quality assurance/ Quality control ;

- Cooperate in carrying out monitoring programmes and submit the resulting data to the Secretariat.
- Comply with quality assurance prescriptions and participate in intercalibration exercises.
- Use and develop, individually or preferably jointly, other duly validated scientific assessment tools, such as modeling, remote sensing and progressive risk assessment strategies.
- Carry out, individually or preferably jointly, research which is considered necessary to assess the quality of the marine environment, and to increase knowledge and scientific understanding of the marine environment and, in particular, of the relationship between inputs, concentration and effects.
- Take into account scientific progress which is considered to be useful for such assessment purposes and which has been made elsewhere either on the initiative of individual researchers and research institutions, or through other national and international research programmes or under the auspices of the EU or other regional organizations.
- Coordination and cooperation with (SEIS).

III. Monitoring sites & use of a risk-based approach to select these

- The priority is to identify the most sensitive areas that are higher pressures case by case.
- Monitoring efforts should be prioritised in the areas and topics that most risk.
- These areas should be monitored more frequently in relation to those quality components at risk to achieve/maintain GES and associated relevant pressures than other areas that have maintained GES for a long period of time and are under less pressure.
- Increased monitoring effort may be needed in areas that are close to the boundary of GES in order to increase confidence in assessments and, consequently, in the decision to take measures.
- Identify practical priorities on the environmental situation while maintaining monitoring requirements.
- Use recommendations of (Cardoso et al., 2010) are guided to identification of assessment priorities.

I. Frequency and time series of monitoring data

The monitoring frequencies to be used in different phases should depend on the intensity of changes in hydrographical and morphological conditions occurring on the site (case by case).

implementation of IMAP it's difficult in current situation , but they can be envisaged when the political situation will improve in the country, suggest that the initial phase be in the fourth quarter of 2018.

yearly monitoring is costly and difficult to implement and Depends on candidate common indicators, each 6 years

- There is no formal monitoring network for the coastal marine environment in Libya, Scattered studies and surveys do not cover the entire coastal strip nor serve the aims of ICZM Protocol .

C. Implementation/Operational plan

Operational arrangements (logistics, human resources, and financial resources) ; The main responsibility for implementation and coordination rests on General Environment Authority and technical support in collaboration with the Marine Biology Research Centre (MBRC) , Department of Zoology at the faculty of science at the University of Tripoli , Libyan Centre for Remote Sensing and Space Science (LCRSSS) and others stakeholders engagement .

- After 2011, all activities of research centres are weak due to security reasons , political instability and lack of financial resources.
- Depend on operation plan for EO & Scope of work can establishment the committee or team for Implementation Consistent with IMAP ,logistics are supported by EGA , Qualified human resources exist for all, more capacity building needed in the area of (remote sensing) and their contribution to the modelling, processing, data, specific software , GIS , implementation training courses related to IMAP .
- Remote Sensing Centre (LCRSSS) can handle this indicator due to its expertise in mapping and GIS , can provide modern or old satellite images or express images specific to the history, Photos available in the center free satellite images Land Sat 30m , how much more can be obtained for a financial amount.
- Bathymetric map up-to-date for all coast not found in (MBRC) especially the affected areas , some maps for sea ports are available ,but for obtain new map only available in privet sector .
- Participatory tools are reported through the development of the consultations and their results to form the basis of the data received, including linking issues with stakeholders and improving stakeholder engagement plan with relevant aspects.

The responsibility for implementation;

- **Responsibility of implementation lies on EGA** ; Coordination, management and logistics support of monitoring activities(eg. technical meetings ,consultation, EBLs, documents , dialog with relevant stakeholders and experts).
- Ratification of the ICZM Protocol.
- Location and extent of habitats that might be affected by hydrographic changes

list of areas where alterations could be expected due to new developments.

Data sharing and access principles, including reporting formats;

- Data Sharing can be performed using the geoportal of the Libyan Centre for Remote Sensing and Space Science (LCRSSS).
- Many marine EIAs study is available in EGA.
- Previous studies for coastal areas are available.
- Most of parameters (air, water ,soil, biological) are available.
- Map of protected area, wet land, habitats, Cultural Heritage are available.
- Lists of coastal facilities (sea ports , marine supply base for oil and gas ,power station ,factories,..)are available.
- Coordination and cooperation with Shared Environmental Information System (SEIS), PAP/RAC, (GEO),(GMES),CBD.

Length of coastline subject to physical disturbance due to the influence of manmade structures

A. Institutional and regulatory aspects

- Law no 15 of 2003 (Previously – law no 7/1982) which constitutes the conclusion of previous laws where aims at protection of the surrounding against pollution and it's applied by EGA .

EGA calls for preparation study of "EIA/EBS" for all projects after Localization of the project according to the procedures in force

Summary of Relevant EIA Administrative Instruments ;

Topic	Law/Decision	Title	Item	Administrative Authority
Environmental Impact Assessment	Decision of the General People's Committee 22/1/2002	Implementation of Environmental Protection Principles	<ul style="list-style-type: none"> Requirement to conduct environmental assessment prior to providing licenses to projects 	Environment General Authority
	Law 15/2003	Protection and Improvement of the Environment	<ul style="list-style-type: none"> Approval of licence as far as environmental protection is concerned is issued by EGA. Environmental requirements can be specified after reviewing the related Environmental Impact Study (Art. 6 No. 11 and 12) 	Environment General Authority

After 2011 there are no recent lists of existing coastal activities , All coastal activities obtained official approvals are documented by EGA and We have not been able to verify that it continuing operating in the current circumstances.

There are many illegal negative phenomena in coastal areas related to indicators that need monitoring and assessment , but after carryout field surveys.

EGA shall follow up on the approvals issued through the data relating to environmental performance and the project's compliance with environmental commitments according EIA And has the right apply provisions of Executive Regulations of Law No. 15 of 2003 , According to the following articles :

- **Article (4)** All concerned bodies shall take into environmental considerations in the of various projects including projects of population, facilities, transport, energy, industry, agriculture, tourism and others by doing the following
 - a. Conducting environmental impact assessment studies for projects prior to establishment and submitting them to the EGA for accreditation.
 - b. Comply Libyan specifications, standards in design, implementation, operation and maintenance.
 - c. Take preventive and remedial measures related to pollution that may occur in the project stages.
 - d. Preparation of(monitoring / control programs) and accreditation from EGA.

- e. Prepare reports on the environmental status of the project and its extent compliance with environmental standards and submit them to the EGA twice a year.
- f. EGA shall have the right to issue the necessary instructions to introduce changes to any project or facility, whether private or public, Also issue instructions on operating methods, identify methods of disposal of pollutants or modification or change type of fuel or raw materials.
- g. **Article (9)** Prohibits competent authorities - each in its own jurisdiction - shall grant any licenses to carry out any activity that may result pollution Only after obtaining license applicant from the Authority and determining the activities that may result pollution and follow procedures of environmental impact assessment and their results from those activities by decision from EGA.

Lists of sites for different types of infrastructure located along the coastline can be submitted without details.

Articles aimed directly or indirectly to protect the coast are:

- Chapter (2) protection of atmospheric air, article (10) & article (10).
- Chapter (3) protection of Seas and Marine Wealth . articles ,(18),(19),(20),(21),(22),(330),(340),(35),(36),(37) and article (38).
- Chapter (6) Reformation of environment . article (51) paragraph ,(8),(21),(23) and (24).

Also ,There are many local laws containing texts for protect coastal strip.

- **Law No. (3) of 2001 Concerning Urban Planning**

Some of the relevant objectives of the law;

- Optimal exploitation of economic and human resources spatially.
- Ensure the distribution of the requirements of population growth within the schemes to achieve economic and social parity.
- Optimal use of land and organize its functions for various purposes and the protection of agricultural land from urban crawling.
- Supporting environmental conservation directives.
- - Contribute to the protection of the environment using scientific methods in the distribution of population and utilities and the organization of services.
- Preserving the natural, archaeological, historical, and tourist attractions and the areas closed to the coast .
- Article (25) of the law stipulates that building not be permitted on the lands closed to the seashore. The executive regulation of this law shall specify the appropriate distance and the rules and regulations relating to this article.
- Decision of the General People's Committee No. (406) for the year 2009 to issue the executive regulation of law No. (3) for the year 2001 on urban planning.

- **Executive regulation of Law No. 3 of 2001 Concerning Urban Planning**

The protection of the beaches of the sea shall be at least 100 meters.

- **Law No. (5) for the year 1969 regarding the planning and organization of cities and villages**

- Article (4) of the law concerning the use and classification of areas Article (22) The acronym (1) The building permit outside the schemes is not

permissible except for utilities and agricultural facilities. Article (2) The building license in the said cases shall be in accordance with the conditions and conditions laid down by the Council of Ministers upon .

- Article (22) bis (1)1- It is not permitted, within or outside the plans, to permit building on the land closed to the beaches of the sea, less than 100 meters from the shore boundaries, except for the establishment of projects designated for tourism purposes, which are established by the government, bodies, institutions and public companies.
- **Law No. (5) of 1982 Concerning the Protection of Pastures and Forests**
 - Article 2: The legal responsibility for the protection of forests , Article (3): Monitoring and enforcement.
 - Article (4-5): Terms of reference of the Ministry of Agriculture and Urban Development of Municipalities .
 - Article (20): Responsibilities of the Ministry of Agriculture for the work on soil stabilization and vegetation cover.
 - Article (22) Prohibition of cutting trees and plants threatened with extinction in order to preserve their species.

B. Scientific aspects

There are more than specific indicator related to physical disturbance due to the influence of manmade structures (Land-use changed) along the coastal strip (e.g. ,land use, land take ,land management, Habitat fragmentation and land cover.)

The draft report did not include the identification of the indicators and their lengths or location , But general review for current situation according to the of IMAP tasks and there is no recent study combining the above indicators , There are scattered reports for negative impact phenomena on the environment, especially coastal areas , But all focus on pollution & contamination.

Review biological parameters and previous studies related to the coastal environment and marine and its local (management / monitoring) system as a guide.

Through this project, we **seek to prepare the technical framework** by drawing up lists of inventories of natural coastal with urbanized coastline shares.

- Parameters or elements to monitor ;
 - Hard coastal defence, Ports and marinas, Land claim, Impervious surface in the hinterland (100 meters from the coastline), landward impervious surfaces
 - coastal wetlands , Impervious surfaces
 - coastal erosion (: waves, winds, tides, near-shore currents, sea level rise), Sediment extraction, Hydrocarbon and gas mining activities,litter.
 - Regional e/subregions list of species , habitats (main biodiversity components it's available in EGA).
- Methods and protocols including photointerpretation
 - Local legislation and guideline .
 - ICZM potocol .
 - ground survey of the shoreline by manual tools.
 - Use Remote Sensing for photo -interpretation.

- Use high-resolution satellite imagery
- Usage of reference coastline
 - This is the specialty of the Libyan Survey Department (L S D) and not (LCRSSS) , the approved reference of the coastline are ground controls (survey points) and the latest update (LGD - 2006) , All projection systems are available.
 - Reference coastline with higher resolution can be produced if requested from LCRSSS.
- Frequency and time series of monitoring data
 - Monitoring manmade structures data should be update at least every six years.
 - Shoreline survey of sandy coastline under manmade pressure should be repeated annually.
 - Implementation of IMAP it's difficult in current situation , but they can be envisaged when the political situation will improve in the country, suggest that the initial phase be in the fourth quarter of 2018.

C. Implementation/Operational plan

- **Operational arrangements** (logistics, human resources, and financial resources); Operational arrangements and coordination rests on General Environment Authority and technical support in collaboration with, Forming a committee of related sectors, EGA lies on Coordination, management and logistics support of monitoring activities(eg. technical meetings ,consultation, EBLs, documents , dialog with relevant stakeholders and experts) and Claiming to cover part of the costs.
- **Responsibility for implementation**

EGA with related institutions (**LCRSSS** , **MBRC**, **Department of Urban Planning**) than , Ministry of Local Government- Coastal Municipalities, Faculty of Science(Tripoli university) , NGOs.
- **Data sharing and access principles, including reporting formats**
 - Data Sharing can be performed using the geoportal of the Libyan Centre for Remote Sensing and Space Science (LCRSSS).
 - Many marine EIAs study is available in EGA.
 - Previous studies for coastal areas are available.
 - Most of parameters (air, water ,soil, biological) are available.
 - Map of protected area, wet land, habitats, Cultural Heritage are available.
 - Lists of coastal facilities (sea ports , marine supply base for oil and gas ,power station ,factories,....)are available.
 - Coordination and cooperation with Shared Environmental Information System (SEIS), PAP/RAC, (GEO),(GMES),CBD.

Land- use change

Institutional and regulatory aspects

- Law no 15 of 2003 Implementation by EGA
EGA calls for preparation study of "EIA/EBS" for all projects after Localization of the project according to the procedures in force.
- Many articles related to coast and marine protection .
- Law No. (3) of 2001 Concerning Urban Planning.
- The executive regulation of this law of law 3/2003.
- Law No. (5) for the year 1969 regarding the planning and organization of cities and villages.
- National Classification and Land Use Regulations.
- Law No. (5) of 1982 Concerning the Protection of Pastures and Forests
Article 2: The legal responsibility for the protection of forests , Monitoring and enforcement for Ministry of Agriculture.

Implementation/operational plan

- Libyan Centre for Remote Sensing and Space Science (LCRSSS) can Product of high resolution aerial photographs (VHR) to monitor the change of land use.
- EGA and partners can interpretation of the monitoring results also can provide information on the impacts to coastal ecosystems, habitats and landscapes.
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