PROJECT TITLE: Implementation of the Strategic Action Program of the Gulf of Mexico Large Marine Ecosystem

Annex 1: Environmental and Social Management Plan (ESMP)

1. Project Description

In this section, a brief description of the project should be provided, as this indicates the relevant context for the ESMP. The location of all project actions should be described and a map showing their location provided. Basic information on the environment at these locations should also be included as this helps provide the environmental context to which the environmental management plan applies.
Additionally, the main outcomes of the environmental and social risk screening that was done at the concept/PIF level, such as environmental and social (E&S) risk category and identified E&S issues should be defined.

The UNIDO/GEF Project "Implementation of the Strategic Action Program of the Gulf of Mexico Large Marine Ecosystem" (GEF ID 6952; 2016-2020 – GoM-LME Project, or the Project) is a 5-year project specifically aimed at facilitating the implementation of the Mexico/US endorsed Transboundary Diagnostic Analysis (TDA – 2011) and Strategic Action Plan (SAP – 2013) for the integrated management of the GoM-LME. The project focuses on the Gulf of Mexico and the main river basins from Mexico that flow into it (Figure 1) and one coastal lagoon (Figure 2). The Gulf of Mexico Large Marine Ecosystem (GoM-LME) supports major American, Cuban and Mexican fishing industries, a large oil extraction industry and other lucrative economic activities including tourism. United States of America and Mexico and their economies are strongly tied to the GoM LME yet they face, although to different degrees, fisheries related management issues.

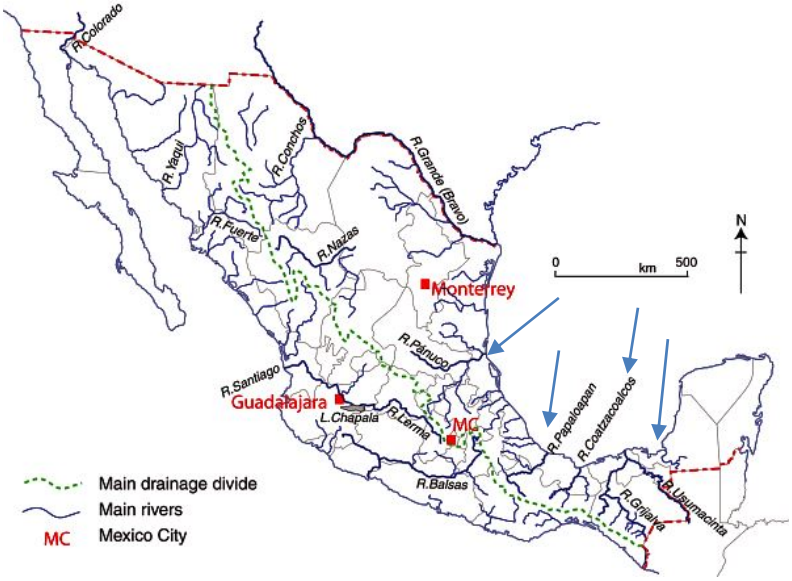

Fig 1. Map of Mexican rives [1]

[1] http://geo-mexico.com/?p=9117

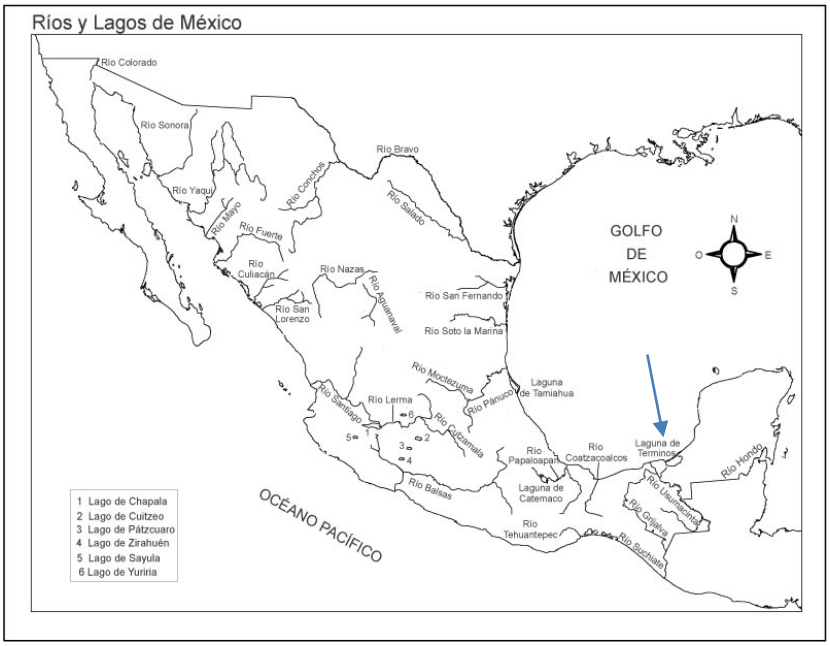

Fig 2. Map showing the Laguna de Terminos[2]

The Transboundary Diagnosis Analysis (TDA) identified three key transboundary environmental problems:

- Pollution including eutrophication and harmful algal blooms (HABs);
- Habitat modification (wetland loss, connectivity, loss of resilience); and
- Overfishing of shared, migratory and connected fish stocks.

Linked to the overfishing (illegal and unregulated), the lack of governance as well as limited knowledge of ecosystem functioning, an additional problem is the increased pressure of the local communities to further exploit the ecosystem beyond its sustainability limits in order to maintain their livelihoods. Other environmental factors threatening the health of the GoM-LME include eutrophication, algal blooms (HABs) and red tide events that are the result of poorly planned growth in coastal and urban areas bringing changes on the life cycles of coastal and marine species. One of the most serious manifestations of these combined threats, and which both countries experience, is low oxygen extended events or hypoxia. The extent of hypoxia on the GoM's northern continental shelf turn this "dead zone" into the second-largest manifestation of anthropogenic coastal eutrophication in the world, and in recent years Mexican scientists have demonstrated the existence of other similar zones in the Southern GoM, around the Campeche Sound.

The transboundary effects and the need to agree and prepare joint actions to reduce significantly the hypoxic conditions along the GoM is a must for both countries. In particular, Mexico needs to establish robust, long-term monitoring programs, allocate tools, and enhance capacity-building to ensure the

[2] http://ach.mx/wp-content/uploads/2012/04/Mapa-de-mexico-de-Rios-y-Lagos.jpg

reduction of hypoxia impacts, as well as the need for bi-national efforts to develop regional environmental indicators.

The project looks at tackling the root causes of environmental degradation as well as the need to address these at the ecosystem level in order to deliver sustainable, regional and globally relevant results. For this, the methodology is based on an Ecosystem based management (EBM) approach. Therefore the project commits to work on three main components with specific outputs:

- Component 1 focuses on improving water quality to address the root causes related to water processing needs, pollution control and capacity building;
- Component 2 focuses on avoiding depletion and facilitating the recovery of living marine resources. This will contribute to strengthening and implementing the legal framework to promote ecosystem-based management for the fishery sector. This will help to address the root causes related to: ecosystem concerns; planning and management on a per sector basis, accounting for externalities and natural limits of resources; control of traded species; controls of fishing efforts; and, targeting capacity building efforts;
- Component 3 focuses on conservation and restoration of the coastal and marine ecosystem. This component will contribute to strengthening capacities at the local, national and regional levels and will tackle root causes related to capacity building, control of traded and cultured species (including invasive species) and to better define legal and technical issues. The inclusion of key stakeholders and promotion of dialogue will ensure that ecosystem concerns and externalities are taken into consideration in planning and management.

1.1 Background information

The Gulf of Mexico is the ninth largest body of water in the world and the largest semi-enclosed coastal sea in the Western Atlantic covering 1.6 million km^2. Its eastern, northern and northwestern shores span 2,700 km and touch on five US states (Florida, Alabama, Mississippi, Louisiana, and Texas); southwestern and southern shores span 2,243 km and lie along five Mexican states (Tamaulipas, Veracruz, Tabasco, Campeche, Yucatan, and the northernmost tip of Quintana Roo). On its southeast quadrant the Gulf is bordered by Cuba. The land that forms the GoM´s coast, including many barrier islands, is uniformly low-lying and characterized by marshes, swamps and straits of sandy beach and river basins draining into the Gulf waters from Mexico and the US[3].

Environmental characteristics:

The Gulf of Mexico is considered one of the Great Marine Ecosystems due to its high biodiversity, natural resources under different environmental pressures and human activities. The GoM is a large, productive, warm water marine and coastal ecosystem that provides extraordinary goods and services to Gulf Coast communities. The GoM has different environments including salt marshes and mangrove forests, oyster reefs, seagrassess, barrier islands, and corals. All these ecosystems contribute to a large variety of species, endemic, native and migrant.

The Mexican coastline contains more than 50% of national wetlands, near 6,000 km2 of coastal lagoons, 24 estuaries, and the most extensive areas of coral reef in Mesoamerica. These habitats holds more than

[3] The US portion of the GoM receives water from thirty-three major rivers that drain 31 states (TDA)

8,500 species of marine invertebrates and fishes, 328 species of birds, 29 species of marine mammals, and share 5 out of the 11 species of current marine turtles (Benitez et al 2014)[4].

Demographic data

The coast of Mexico in the GoM is highly dynamic not just because of its environment but also because of the economic and social characteristics. In the coastline municipalities, nearly 20 million of people live (nearly 25% of Mexican population). Of the 126 of the largest cities in the country, nearly 30% are in the coast (SEMARNAT 2007)[5]. The population size in the U.S. Gulf states of Alabama, Florida, Mississippi, Louisiana and Texas is approximately 56 million, accounting for nearly 20 percent of the total U.S. population. Not only is the human population growing in the Gulf Coast region, but housing development expanded 20 percent from 2000 to 2010. (NOAA, 2011, in Love et al, 2014[6]).

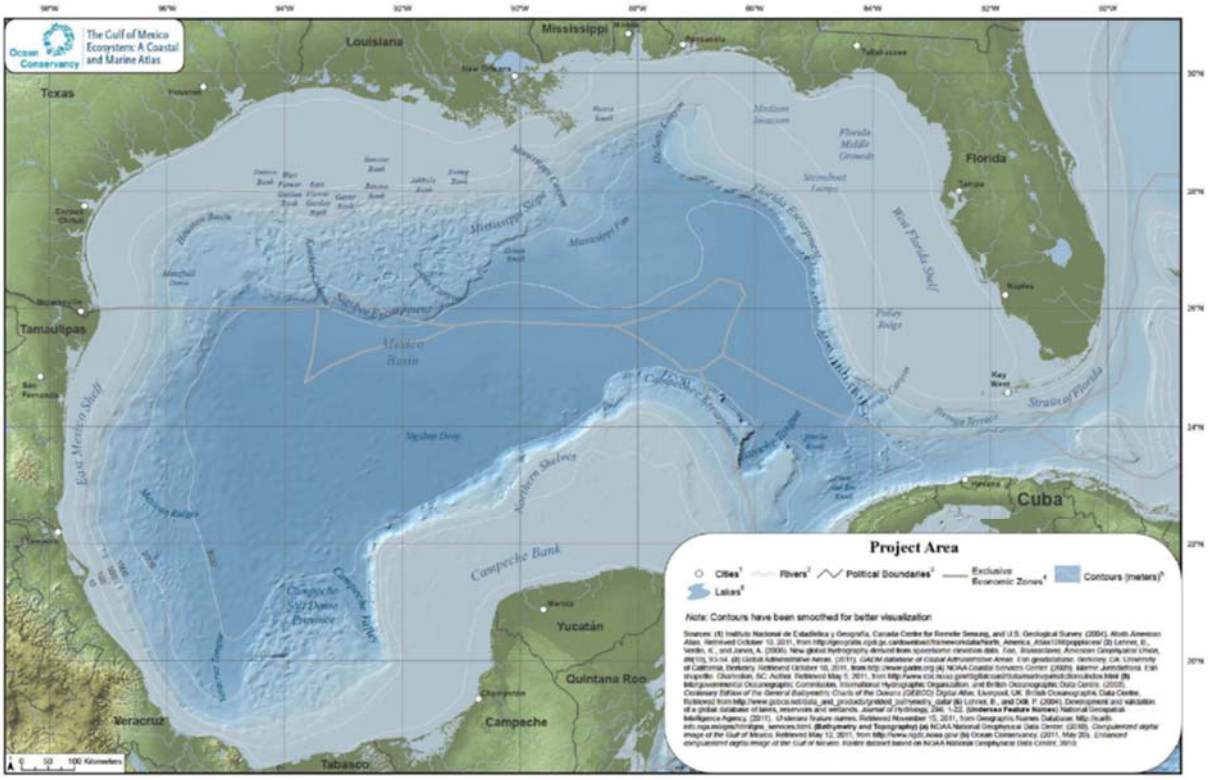

Figure 3. Main cities and characteristics of the Gulf of Mexico (Love et al, 2014).

Environmental Pressures:

Different "natural" and human impacts have put more pressure on the dynamics and natural resources of the Gulf of Mexico. Love et al (2014) through the Ocean Conservancy have identified a series of

[4] Benitez, J, Cerón-Bretón RM, Cerón-Bretón JG & Rendón-Von-Osten, J. 2014. The Environmental Impact of Human Activities on the Mexican Coast of the Gulf of Mexico: Review of Status and Trends. WIT Transactions on Ecology and the Environment. http://www.witpress.com/elibrary/wit-transactions-on-ecology-and-the-environment/181/25969

[5] SEMARNAT 2007. Proceso De Ordenamiento Ecológico Marino Y Regional Del Golfo De México Y Mar Caribe Región Costero-Terrestre Y Marina Fase De Caracterización. Mexico.

[6] Love et al. 2014. The Gulf of Mexico Ecosystem. A Coastal and Marine Atlas. The Ocean Conservancy. USA. file://icnas4.cc.ic.ac.uk/radc/downloads/atlas-online-compressed.pdf

impacts including: the Coastal Population Density; impacts of climate change (e.g. change in sea surface Temperature, change in ocean acidification; projected sea level rise), land area change, low oxygen areas, hazardous materials spills and non-native species of concern (e.g. tiger shrimp).
Added to this the overfishing of certain species and even tourist activities add pressure to the system.
The best known environmental problem in the GoM is the dead zone, which is an area of low oxygen or hypoxia, which develops every summer on the continental shelf, west of the Mississippi River Delta. It has averaged 17,350 square km from 2007 to 2011 and can extend from near shore to 125 km off the coasts of Louisiana and Texas. It has been expanding west into Texas waters, and new areas of hypoxia were documented east of the Mississippi River outflow in 2011 (Rabalais & Turner, 2011; LUMCON, 2010 in Love et al 2013). According to Love at al. (2013), there is limited information on the occurrence of hypoxia in Mexico and Cuba, and only one has been documented along the Yucatán Peninsula. Hypoxic conditions occur when dissolved oxygen concentrations are less than 2 to 3 milligrams of oxygen per litre of water. These low oxygen areas often do not have sufficient dissolved oxygen concentrations to support animal life, so animals will flee or die; hence, the name "dead zone" (Love et al, 2013)[7].

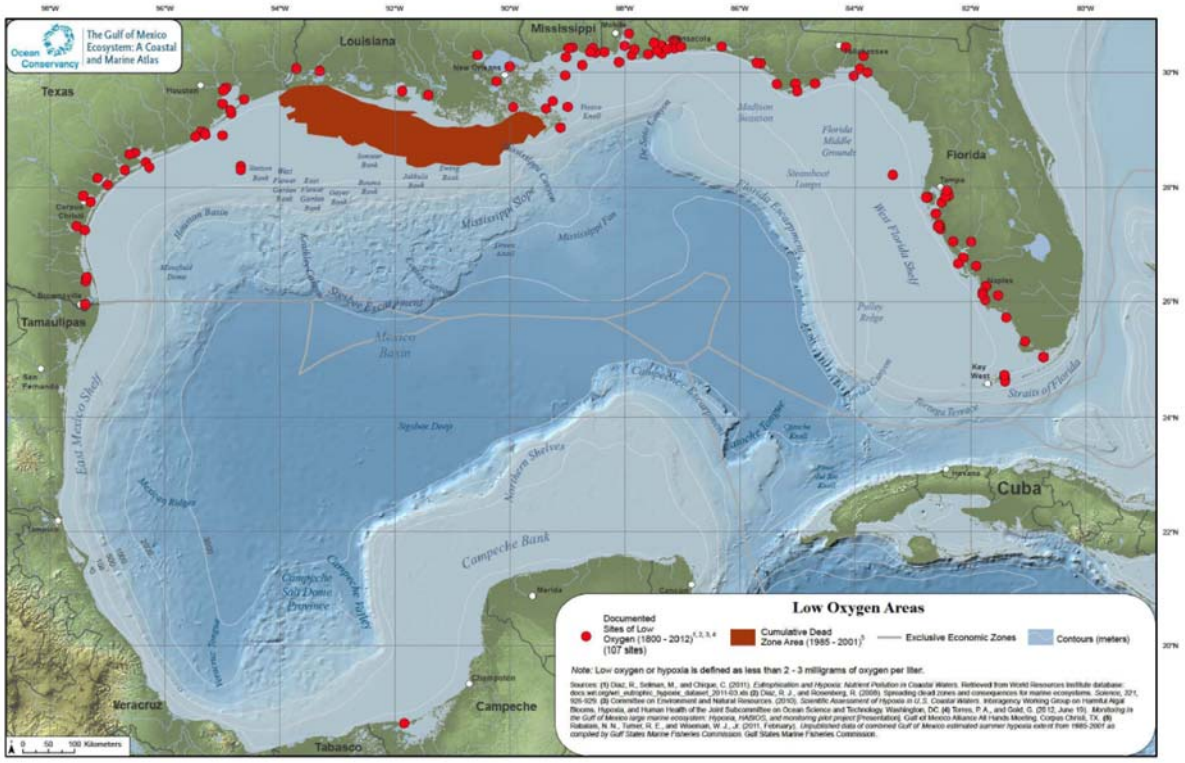

Figure 4 Low oxygen areas (Love et al 2013).

<u>Economic activities: fisheries</u>

The Gulf of Mexico Large Marine Ecosystem is home to hundreds of commercially important fish species, many of which inhabit the Exclusive economic zones (EEZ) of both countries. Despite the many species occurring in the territorial seas or EEZ of Mexico and the US, some of these are subpopulations

[7] Love, M., Baldera, A., Yeung, C., & Robbins, C. (2013). The Gulf of Mexico Ecosystem: A Coastal and Marine Atlas. New Orleans, LA: Ocean Conservancy, Gulf Restoration Center.

or stocks considered or treated as local or closed populations, because of limited biological exchange with other distant subpopulations. In this sense, biologists classify species according to their natural ability to spread, disperse, move or migrate to occupy different habitats and areas, and these features have very important implications when different countries share the stocks.

Main socio-economic problems

The STAP assessment identified a series of socio-economic problems affecting the region:

1. Insufficient water processing infrastructure included in sectorial planning;
2. Incomplete pollution control;
3. Ecosystem concerns not sufficiently considered in planning and management;
4. Planning and management done in a per-sector basis without proper accounting of externalities and natural limits of resources;
5. Capacity building not in pace with the need to address ecosystem, social or economic concerns;
6. Insufficient control of traded or cultured species;
7. Insufficient control of involuntary invasive species transport;
8. More precise legal and technical definitions needed to adopt the Ecosystem-Based Management approach as a common strategy; and,
9. Fishing effort entry controls not effective enough.

2. Policy, legal, and administrative framework

In this section, a brief description of the relevant national policy, legal, and administrative framework which could define/help shape issues/risks that need to be included into the EMSP, should be provided.
Additionally, compliance with applicable international, national and local policies laws, regulations, safeguards, performance safeguards, policies, procedures should be indicated.

Mexican Laws, regulations and Institutions

The legal framework in Mexico attributes full jurisdiction to the Federal Government in matters related to the coastal zone, sea, oil, seabed, subsoil, natural protected areas, national waters (rivers, lagoons, etc.), wildlife, sea life, and fisheries. Coastal states have limited jurisdiction to regulate over land use and some types of permitting in the coastal zone. In the US, the Federal Government has jurisdiction over the US Exclusive Economic Zone (EEZ), which extends 200 nm. The five States bordering the Gulf of Mexico have jurisdiction over state waters inside of the US EEZ.

The Mexican Constitution establishes in Article 4 the right to a healthy environment for human development and wellness. Article 27 establishes the rules for natural resources use, exploitation and conservation; Article 73 regards the prevention and control of pollution,; and Article 25 relates to the environmental protection of productive resources when incentivising private sector development.
A series of Laws, National Programmes and International agreements regulate the Natural Resources in Mexico. Relevant to this project include:

- General Law on Ecological Equilibrium and Environmental Protection
- General Wildlife Law;
- National Waters Law (LAN)
- General National Assets Law
- Federal Law on Fisheries and Aquaculture

- General Law on Human Resettlement
- Climate Change Law
- Federal Environmental Liability Law (LFRA).
- Law of Navigation and Maritime Commerce

Additional regulations request permits for the use of resources or to assess environmental and social impacts of projects[8]:

Permits of environmental impact:
Established in Section V of the LGEEPA and its regulation on Environmental Impact Assessment.
Environmental Hazard, established in the LGEEPA, article 147.
Permits for the use of natural resources:
Article 27 of the Mexican Constitution establishes that the nation has the right to transfer the domain of water and soil to individuals, and also to regulate the use and exploitation of natural resources.
Minerals: the Mining Law art. 10 to 18.
Water: the LAN art. 20 to 25.
Flora and fauna: the General Wildlife Act.
Forestry: the General Law on Sustainable Forestry Development.
Environmental permits can sometimes be transferred; for example, there are subjects of environmental legislation in which permits or authorisations

The regulation of the landscape is not regulated in Mexico; however, what is regulated in terms of water and natural resources are environmental services.
In 2013 the Mexican Energy Reform was adopted and this also includes as section on The "Environmental Matters" pointing out three subjects: sustainability in economic activities in article 25; the creation of the National Agency of Industrial Safety and Environmental Protection of Oil Sector (Agency); and the Transition Strategy to promote the use of cleaner fuels and technologies.

The National structural organization regarding the environment has as the main Secretary or Ministry of Environment and Natural Resources (SEMARNAT) as the Government's agency in charge of the protection, restoration and conservation of ecosystems, natural resources and environmental services of Mexico, with the purpose of fostering their use and sustainable development. SEMARNAT's organic structure has the main environmental agencies such as: the National Water Commission (CONAGUA); the Federal Attorney for Environmental Protection (PROFEPA), responsible for monitoring legal compliance; the National Commission of Natural Protected Areas (CONANP); the National Institute of Ecology and Climate Change (INECC); the National Forestry Commission (CONAFOR); and the Mexican Institute of Water Technology (IMTA). The National Biodiversity Commission is an inter-ministerial commission that promotes, coordinates and supports activities related to enhance the knowledge, conservation and sustainable use of biodiversity for the social benefit.

A legal instrument within SEMARNAT in Mexico regarding the Gulf of Mexico is the National Environmental Policy for the Sustainable Development of the Oceans and Coast: A strategy for their conservation and sustainable use (PANDSOC)[9]. Within this policy the Marine and Regional Zoning Plan

[8] http://www.iclg.co.uk/practice-areas/environment-and-climate-change-law/environment-and-climate-change-law-2015/mexico
[9] http://www.semarnat.gob.mx/temas/ordenamiento-ecologico/bitacora-ambiental/bitacora-ambiental-golfo-de-mexico-y-mar-caribe

of the Gulf of Mexico (2007) was accepted. This Zoning plan for the Gulf of Mexico and the Caribbean id the tool for environmental policy that helps to regulate land use and economic activities in order to protect the environment and make a better use of natural resources in a sustainable form. Another legal document is the Code for the use of the territorial sea, navigation, beach, maritime federal zone and land taken from the sea.

Regarding water, the National Water Commission of Mexico (*Comisión Nacional del Agua*, CONAGUA) is responsible for testing, authorizing and assigning the allocation of water use. CONAGUA systematically tests water quality through its National Monitoring Network, which in 2013[10] included 5,025 monitoring sites distributed throughout Mexico

Other organisations that are relevant to the project include the National Aquaculture and Fishing Commission (CONAPESCA), the National Commission for Protected Areas (CONANP), the Consortium of Marine Research Institutions in the Gulf of Mexico and the Caribbean (CiiMar-GoMC), the UNEP Global Program of Action for the Protection of the Marine Environment from Land-based Activities (GPA for LBA).

USA Laws, regulations and Institutions

In the US the Environmental Protection Agency was created in 1970 with the purpose of protecting human health and the environment by writing and enforcing regulations. Some of the USA regulations on Water and Species protection may be also linked to other Departments such as Agriculture or Interior. In 2010 the U.S. Department of the Interior's Minerals Management Service (MMS) was divided into three new regulatory bodies: the Bureau of Ocean Energy Management (BOEM), the Bureau of Safety and Environmental Enforcement (BSEE), and the Office of Natural Resources Revenue (ONRR).
The USA National Oceanic and Atmospheric Administration (NOAA) is a federal agency focused on the condition of the oceans and the atmosphere. Its activities include monitoring to fisheries management, coastal restoration and supporting marine commerce[11]. NOAA's Integrated Ecosystem Assessment (IEA) program supports Ecosystem-Based Management (EBM) which is currently being implemented in 5 regions across the United States, being the Gulf of Mexico one of them[12].
Although this project is not strictly related to spill oil damages, it is important to mention that the USA Oil Pollution Act of 1990 requires that the government undertake a Natural Resource Damage Assessment (NRDA) following an oil release to help recover resources harmed by the oil. This is what happened after the Oil spill of BP in the Gulf of Mexico where 1blln USD have been deployed for the restoration[13]. The projects may help to provide examples of activities and how to engage stakeholders in the communities affected.

Other relevant international agreements:
Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973)
Convention on Biological Diversity (CBD), Nairobi, 1992.
U.N. Convention on the Law of the Sea (1982);
Convention on Wetlands of International Importance, especially as Waterfowl Habitat, Ramsar, 1971.

[10] Data from 2013 is the most curent available
[11] http://www.noaa.gov/about-noaa.html
[12] http://www.noaa.gov/iea/index.html
[13] http://eli-ocean.org/gulf/restoration-projects-database/

Convention on Environmental Impact Assessment in a Transboundary Context (only signed by the USA 1991)

3. Environmental and social risks and mitigation measures

In this section, information about the relevant environmental and social risks that were identified during the project preparation period (PPG) should be provided. Since ESMP should serve as an active tool, additional risks that are identified during the project implementation should be included as they are identified.
For each identified risk, mitigation measure should be briefly described including the conditions under which the measure is required (for example, continuously or in the event of contingencies). The mitigation measures should be accompanied by, or referenced to, project design and operating procedures which elaborate on the technical aspects of implementing the various measures. Additional information, such as technical details of the mitigation technology, location of the potential E&S impact, timelines, responsibility and cost of the mitigation measure should be included.

The PIF document identified several risks in this project.

1) Political willingness of the participating countries to cooperate; their willingness to continue project programs and approaches after the life of the GEF intervention; and the extent to which activities successfully engage the stakeholders that are the subject of intervention.
2) National interest that may conflict with the objectives of the project mainly due to the transboundary nature of impacts and projects.
2) Climate change impacts and adaptation measures for ecosystems and production systems. The characteristics of the impacts and how to address them will depend on the type of system as well as the risks to which these are exposed.
3) Inclusion of private sector to participate in the measures

These are explained in the following table.

Table 1: Main environmental and social risks

	E&S risks	Mitigating Measure	Technical details of the mitigation technology, process, equipment, design and operating procedures	Location	Timeline, including frequency, start and end date	Responsibility	Cost of Mitigation (If Substantial; to be covered by the GEF grant or non-UNIDO co-financing)
Risks identified during the PIF preparation and verified during the project preparation(PPG	Risks associated with point sources of water pollution in the surrounding rivers and Gulf of Mexico.	Technical assistance to apply the UNIDO Transfer of Environmentally Sound Technologies to make industries more resource efficient, will support them in applying cleaner production approached and the adoption of Environmentally Sound Technologies. Thus the project will result in a greening of existing industries and an overall reduction of E&S risks associated with point source pollution in the surrounding rivers and Gulf of Mexico.	Selection of industries with highest pollution emissions and Technical assistance provided to apply the TEST methodology and tools in collaboration with rational and national authorities.	Pollution hotspot areas in the basin regions in the rivers designated in the project and coastal Lagoon of Terminos	Years 1-2 workshops and training sessions to and after reports every 6 months of progression	UNIDO/Regional agencies	Included within the Budget of project component 1
	Heavy metals from industries located around Gulf of Mexico that can accumulate in the rivers affecting animal communities and food chains	Selection of monitoring sites and industries in the region to implement plans to reduce pollutants in water emissions	Mercury emissions will be addressed in a complementary MSP that is being developed by UNIDO's Emerging Substances Divisions Monitoring sites coordinated by regional institutions to test water indicators	Hotspots of the river basins (Papaloapan, Coatzacoalcos, Panuco, and Grijalva-Usumacinta rivers)	From year one, permanent monitoring	Regional agencies (IMTA)	Included within the Budget of project component 1

	Toxic compounds, such as polyvinyl chloride, from industries located around Gulf of Mexico that can affect the human health and reproductive success of marine life.	Technical assistance for the application of TEST in selected industries in the GoM	50 selected industries with the highest level of pollution identified at the hotspot analysis will receive technical assistance to implement TEST	Selected industries identified in the Hotspots of the river basins (Papaloapan, Coatzacoalcos, Panuco, and Grijalva-Usumacinta rivers)	Years 1-2 after the identification of selected industries	UNIDO/regional agencies	Included within the Budget of project component 1
	Risks associated with depletion of oxygen in water bodies (e.g. red tide).	Under component 1 output 1.4 the implementation of an environmental monitoring programme an early warning system for Harmful Algae Blooms will be establish to reduce E&S risks from depletion of oxygen in sea water bodies	TA and establishment of an inter-agencies cooperation programe for the monitoring of selected sites. A cross institutional on-line platform to share information from the SEMARNAT databases and an early warning system for HABs to alert the population.	Representative coastal sides including coast, beaches, National Parks	Years 2-5 Monitoring assessment every 6 months	UNIDO, Regional agencies/CONABIO/COMAGUA/ SEMARNAT Monitoring data shared with the USA	Included within the Budget of project component 1 (1.4)
	Risks associated with fish hatcheries and shellfish facilities.	Technical assistance will be provided for: • the development of a transboundary stock assessment • the development of management plans for the transboundary stock in Mexico • the amendment of the management plan for this stock in the USA • the implementation of the Fisheries	Establishment of collaborative teams in both governments for the stock assessment; organization of workshops and selection of species; Review of Fishery Management Plans and	GoM National governments of both countries, relevant agencies	5 years project duration with at least 4 meetings per year (online)	UNIDO, transboundary National/regional agencies/INPESCA/NOOA/FAO	Included within the Budget of project component 2

		Management Plans for red grouper and brown shrimp • the implementation of the voluntary. guidelines for sustainable small sale fisheries.					
	Risks associated with construction and coastal development that could influence terrestrial and marine life	The project will not support any construction works in coastal zones.					
	Discharge of sewage that could contain microbial pollutants and result in infectious diseases of aquatic and terrestrial life and human communities	Community education programmes on domestic waste water and solid waste. Community based capacities to reduce E&S risks associated with the discharge of sewage will be reduced	Selection of communities and participants to assess solid waste generation and characterization and waste water and establish the implementation of a tailored education programe	Selection of communities on the 4 hotspots regions in the GoM through surveys and consultation with representatives of	Year2-5 with reports from targeted workshops	UNIDO, Regional agencies/CONABIO/COMAGUA/ SEMARNAT	Included within the Budget of project component 3 (3.1)
	Ecological deterioration of coastal wetlands	Restoration activities including manglar restoration targeted area	Indicators for the monitoring of the restoration assessed every year and documentation of the plans with the local communities	Particularly Laguna de Terminos	Annual from year 1	Representative of local plan and local communities/Consultant	Included in component 3

Note: The GEF project aims to implement a series of activities and plans to enhance the environmental and social conditions in the Gulf of Mexico. These activities include for example the improvement of monitoring systems, dialogue across the different actors in the region, capacity building and technical assistance, trans-boundary cooperation. The project does not include the building of infrastructure in any of the selected sites. The TEST methodology of UNIDO is proposed to improve the management practices of the industrial sector in the region and does not include any type of investment in infrastructure. No negative social and/or environmental impacts are foreseen for the implementation of the project.

4. Environmental and social sustainability monitoring

In this section the monitoring program of the identified E&S risks, should be described. The monitoring program should clearly indicate the linkages between risks/impacts identified, measurement indicators, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions.

Table 2: Monitoring of environmental and social risks

	E&S risks	Parameters to be measured	Monitoring methods and procedures used (e.g. sampling)	Timing/Frequency of measurement	Detection limit	Definition of thresholds	Sampling/monitoring location	Responsibility
Risks identified during the PIF preparation and verified during the project preparation(PPG) and additional risks identified during the project implementation	Risks associated with point sources of water pollution in the surrounding rivers and Gulf of Mexico.	Continue monitoring of dissolved oxygen in basins and other water quality parameters including nutrients in coastal areas and upstream	Tests of water for dissolved oxygen and N content under the TEST monitoring system	According to the monitoring system established in the regions Annual reports	According to parameters and thresholds established in National Norms	According to parameters and thresholds established in National Norms	Basins and upstream in the rivers indicated in the proposal	CONAGUA
	Heavy metals from industries located around Gulf of Mexico that can accumulate in the rivers affecting animal communities and food chains	Sediment Quality Index particularly for mercury and other heavy metals	On-site data collection, analysis and use of index	According to national norm Annual reports	Regulatory requirements for wastewater discharges and water quality according to national norms	According to reviewed National Norms	Industries in the basins of the hotspots Hotspots of the river basins (Papaloapan, Coatzacoalcos, Panuco, and Grijalva-Usumacinta rivers)	National agencies (IMTA, CONAGUA)/UNIDO
	Toxic compounds, such as polyvinyl chloride, from industries located around Gulf of Mexico that can affect the human health and reproductive	Parameters required in national regulation and implementation of actions identified to providing assistance to the selected industries applying the TEST methodology	Sampling of water discharges and review of the reports of the TEST methodology	According to National Norms and to specific objectives of the TEST methodology Annual reports	Regulatory requirements for wastewater discharges and water quality according to national norms	According to National Norms and to the specific objectives of the TEST methodology	Industries in the basins of the hotspots Hotspots of the river basins (Papaloapan, Coatzacoalcos, Panuco, and Grijalva-Usumacinta rivers	National agencies (IMTA, CONAGUA)/UNIDO

	success of marine life.							
	Risks associated with depletion of oxygen in water bodies (e.g. red tide).	Chemical and biological parameters of water quality to inform the database for the monitoring programme to inform on the HABs	Analysis of HAB data from monitoring system through direct in-situ sampling of water and reporting of HABs contingency programme	Six month reports Year 1-5	Availability of data to launch the Early Warning system	Threshold to be defined previous to the EWS	Coastal zones of the selected basins in the GoM	National/Regional authorities 9CONAGUA, IMTA, SEMARNAT AND CONABIO)
	Risks associated with fish hatcheries and shellfish facilities.	State of fish stock, state of fisheries and shellfish facilities and number of FMPs	Selected indicators of the fisheries assessment (stock) and number of measures taken in the FMPs	Year1-5 Annual	Delivered FMPS and activities for implementation	Number of FMPs and defined thresholds for fisheries	Identified fisheries/shellfish facilities in coastal areas of hotspots of the river basins (Papaloapan, Coatzacoalcos, Panuco, and Grijalva-Usumacinta rivers	National/Regional authorities INAPESCA, SEMARNAT AND CONABIO and FAO
	Risks associated with construction and coastal development that could influence terrestrial and marine life	The project will not support any construction works in coastal zones.						
	Discharge of sewage that could contain microbial pollutants and result in infectious diseases of aquatic and terrestrial life and human communities	Number of communities selected and agreed to participate in the surveys of waste and waste water and participation in the education programmes and number of education programmes	Application of surveys and implementation of education programmes	Years1-5 according to objectives of surveys and educations programmes	Evaluation of education programmes and achieved changes	Number of communites that showed changes in behavior for waste water and waste management	Identified communities in the selected hotspots	National/Regional authorities INAPESCA, SEMARNAT AND CONABIO
	Ecological deterioration of coastal wetlands	Seedlings planted mortality and hydrology patterns	GIS to review area and condition of mangroves and monitoring of hydrological conditions	Every three months	No reduction of the has proposed	None	Selected wetlands regions	CONABIO/INECOL

			(e.g. tidal channels and salinity)					

5. Capacity development
    a. Recommended management arrangements for the project, including structure, roles, responsibilities, and authorities;

The capacity development needs are detailed in the project's document. These activities are explained in agreement to the components of the project and with the consideration of a bilateral agreement. The main organisations recognized in each country should act as those responsible for the downstream of the information. In the case of the U.S. the National Oceanic and Atmospheric Administration (NOAA) is identified as the lead organization and several activities involve this capacity building. In the case of Mexico, the Secretariat of Environment and Natural Resources of Mexico (SEMARNAT), is the responsible authority.

In Mexico, a number of relevant authorities are involved under the responsibility of SEMARNAT and are included according to their involvement in the different outputs of the project. These are:

WATER	**ECONOMIC ACTIVITIES**	**NATURAL RESOURCES**	**OTHER**
CONAGUA	INAPESCA	CONABIO	INECC
PROFEPA	CONAPESCA	INECOL	INEGI
NCPC		CONANP	UADY
		CONAFOR	

6. Communication

As part of the GEF Annual Monitoring Report (AMR), UNIDO will annually communicate implementation progress on issues that involve ongoing risk to or impacts on the project stakeholders, and on issues that the consultation process or grievance mechanism has identified as of concern to those stakeholders. The ESMP and the relevant progress reports (PIRs) will be disclosed on the UNIDO public website, under the following link: http://www.unido.org/en/resources/factsheets/unido-gef-projects.html.