GEF-6 REQUEST FOR PROJECT ENDORSEMENT

PROJECT TYPE: Full-sized Project
TYPE OF TRUST FUND:GEF Trust Fund

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PART I: PROJECT INFORMATION

Project Title: Implementation of the Strategic Action Program of the Gulf of Mexico Large Marine Ecosystem			
Country(ies):	Mexico	GEF Project ID:[1]	6952
GEF Agency(ies):	UNIDO (select) (select)	GEF Agency Project ID:	140305
Other Executing Partner(s):	The Secretariat of Environment and Natural Resources of Mexico (SEMARNAT), U.S. National Oceanic and Atmospheric Administration (NOAA), Food and Agriculture Organization of the United Nations (FAO), Mexico's National Aquaculture and Fishing Commission (CONAPESCA), Mexico's National Commission of Natural Protected Areas (CONANP), National Cleaner Production Center Tabasco Unit (NCPC-TU), National Water Commission (CONAGUA), Mexican Institute of Water Technology (IMTA), National Fisheries Institute (INAPESCA), the Autonomous University of Yucatan (UADY), Center for Research and Advanced Studies (CINVESTAV), National Commission for Knowledge and use of Biodiversity (CONABIO), National Forest Commission (CONAFOR), Marine Secretarit (SEMAR), Institute of Ecology, A.C. (INECOL)	Submission Date: Resubmission Date:	3/14/2016 9/15/2016 10/07/2016
GEF Focal Area (s):	International Waters	Project Duration (Months)	60
Integrated Approach Pilot	IAP-Cities ☐ IAP-Commodities ☐ IAP-Food Security ☐	Corporate Program: SGP ☐	
Name of Parent Program	[if applicable]	Agency Fee ($)	1,161,000

A. FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES[2]

Focal Area Objectives/Programs	Focal Area Outcomes	Trust Fund	(in $)	
			GEF Project Financing	Co-financing
IW-3 Program 5	Reduce Nutrient Pollution Causing Ocean Hypoxia	GEFTF	5,247,710	50,728,071
IW-3 Program 6	Prevent the Loss and Degradation of Coastal Habitats	GEFTF	2,251,295	21,633,392
IW-3 Program 7	Foster Sustainable Fisheries	GEFTF	5,400,995	51,848,537
	Total project costs		12,900,000	124,210,000

[1] Project ID number remains the same as the assigned PIF number.
[2] When completing Table A, refer to the excerpts on *GEF 6 Results Frameworks for GETF, LDCF and SCCF*.

B. PROJECT DESCRIPTION SUMMARY

	Project Objective: Improve water quality, rehabilitate the coastal and marine ecosystems, and avoid depletion of marine resources in the Gulf of Mexico Large Marine Ecosystem (GoM-LME)						
Project Components/ Programs	**Financing Type[3]**	**Project Impact**	**Project Outcomes**	**Project Outputs**	**Trust Fund**	**(in $)**	
						GEF Project Financing	**Confirmed Co-financing**
1. Improve water quality	TA	Improved water quality through EBM approaches results in a measurable decrease of pollution loads and documented improvements in the health of the ecosystem	Water quality improved using pollution reduction measures through ecosystem-based management approach (EBM) In particular, for 50 industries with the highest pollution emissions: • BOD5, N and P emissions to water bodies reduced by 15% • Industrial water consumption reduced by at least 10%	Output 1.1: Assess water pollution indicators and reinforce quality monitoring mechanisms Output 1.2: Strengthen the dialogue between government and industry Output 1.3: Implementation of the UNIDO TEST methodology in priority hot spots identified in the SAP Output 1.4 - Implementation of the Environmental Monitoring Programme	GEFTF	4,967,415	48,024,528
2. Avoid depletion and recover living marine resources (Fish and shellfish)	TA	Recovery of LMR - specifically of targeted species - when compared to baseline levels, through establishment of no-take zones, effective reduction/closing of fishing	Rebuilding of targeted fish stocks is achieved through implementation of measures, such as update of regulatory framework and	Output 2.1: Implementation of a joint stock assessment Output 2.2: Develop (Mexico)/amend (US) management plans	GEFTF	5,120,700	49,144,994

[3] Financing type can be either investment or technical assistance.

		season, reduction of number of fishing boats and strengthened role of women in fisheries and post harvest activities resulting in: • Rebuilding of red grouper stock to at least 80% of B_{MSY} • Brown shrimp stock maintained at B_{MSY} Sustainable exploitation of these species with in particular 21,000 tonnes of Spanish mackerel caught in a sustainable manner as well as 40,000 tonnes of red grouper, shrimp and other fish species Improved management of other species achieved, as a result of official agrreements and cooperation mechanisms between the US and Mexico, contributing to further recovery of LMR	enforcement, capacity development, and monitoring including, for example withdrawal of 200 artisanal and 100 semi-industrial fisher boats (reducing respectively by 4.5% and 19% the nominal fishing effort)	Output 2.3: Technical support to implement already existing management plans Output 2.4: Implementation of the FAO Voluntary Guidelines on Small Scale Fisheries			
3. Conserve and restore the quality of coastal and marine ecosystems through community involvement and enhanced bilateral cooperation	TA	Improved ecosystem health from reduced pollution and nutrient loads into the mangroves and wetlands, in particular: • 30% reduction of the discharge of pollutants (waste and sewage) • 30% decrease in amounts of waste handled incorrectly • Decrease in nutrient content and other pollutants resulting in a measurable reduction	Improve coastal and marine ecosystem health through the use of the ecosystem- based management approach (EBM)	Output 3.1 - Community education programmes focusing on domestic waste water and solid waste sources Output 3.2 - Community based wetland restoration in selected sites Output 3.3 - Improved coordination and bilateral cooperation through strengthening of networks Output 3.4 - Support effectiveness of Marine Protected Areas by linking	GEFTF	1,971,000	18,929,849

		of contaminated mangrove areas • Accelerated recovery of the mangroves and wetlands cover • Significant and measurable carbon sequestration and water quality improvement In addition, habitat recovered for ecologically important and/or commercialy important fish species, as well as for resident and migratory bird species through promotion of protection and sustainable use of natural resources from an economic, touristic and food security perspective		them into networks			
4. Monitoring and Evaluation	TA	Project activities, outputs, outcomes and impact are successfully achieved / attained	Monitoring and Evaluation and,	4.1 – Midterm Review 4.2 – Final Evaluation	GEFTF	226,600	2,195,779
				Subtotal		12,285,715	118,295,150
				Project Management Cost (PMC)[4]	GEFTF	614,285	5,914,850
				Total project costs		12,900,000	124,210,000

[4] For GEF Project Financing up to $2 million, PMC could be up to10% of the subtotal; above $2 million, PMC could be up to 5% of the subtotal. PMC should be charged proportionately to focal areas based on focal area project financing amount in Table D below.

C. CONFIRMED SOURCES OF CO-FINANCING FOR THE PROJECT BY NAME AND BY TYPE

Please include evidence for co-financing for the project with this form.

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount ($)
Recipient Government	US-NOAA	In-kind	85,000,000
Recipient Government	SEMARNAT	In-kind	38,750,000
GEF Agency	UNIDO	Grants	110,000
GEF Agency	UNIDO	In-kind	350,000
Total Co-financing			124,210,000

D. TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES) AND THE PROGRAMMING OF FUNDS

GEF Agency	Trust Fund	Country Name/Global	Focal Area	Programming of Funds	(in $)		
					GEF Project Financing (a)	Agency Fee a) (b)[2]	Total (c)=a+b
UNIDO	GEF TF	Mexico	International Waters	(select as applicable)	12,900,000	1,161,000	14,061,000
Total Grant Resources					12,900,000	1,161,000	14,061,000

a) Refer to the Fee Policy for GEF Partner Agencies

E. PROJECT'S TARGET CONTRIBUTIONS TO GLOBAL ENVIRONMENTAL BENEFITS[5]

Provide the expected project targets as appropriate.

Corporate Results	Replenishment Targets	Project Targets
1. Maintain globally significant biodiversity and the ecosystem goods and services that it provides to society	Improved management of landscapes and seascapes covering 300 million hectares	*3,000 hectares (mangroves)*
2. Sustainable land management in production systems (agriculture, rangelands, and forest landscapes)	120 million hectares under sustainable land management	*hectares*
3. Promotion of collective management of transboundary water systems and implementation of the full range of policy, legal, and institutional reforms and investments contributing to sustainable use and maintenance of ecosystem services	Water-food-ecosystems security and conjunctive management of surface and groundwater in at least 10 freshwater basins;	*Number of freshwater basins*
	20% of globally over-exploited fisheries (by volume) moved to more sustainable levels	*2.03 Percent of fisheries, by volume*
4. Support to transformational shifts towards a low-emission and resilient development	750 million tons of CO_{2e} mitigated (include both	metric tons

[5] Update the applicable indicators provided at PIF stage. Progress in programming against these targets for the projects per the *Corporate Results Framework* in the *GEF-6 Programming Directions*, will be aggregated and reported during mid-term and at the conclusion of the replenishment period.

path	direct and indirect)	
5. Increase in phase-out, disposal and reduction of releases of POPs, ODS, mercury and other chemicals of global concern	Disposal of 80,000 tons of POPs (PCB, obsolete pesticides)	*metric tons*
	Reduction of 1000 tons of Mercury	*metric tons*
	Phase-out of 303.44 tons of ODP (HCFC)	*ODP tons*
6. Enhance capacity of countries to implement MEAs (multilateral environmental agreements) and mainstream into national and sub-national policy, planning financial and legal frameworks	Development and sectoral planning frameworks integrate measurable targets drawn from the MEAs in at least 10 countries	*Number of Countries:*
	Functional environmental information systems are established to support decision-making in at least 10 countries	*Number of Countries:*

F. DOES THE PROJECT INCLUDE A "NON-GRANT" INSTRUMENT? NO

(If non-grant instruments are used, provide an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF Trust Fund) in Annex D.

PART II: PROJECT JUSTIFICATION

A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN WITH THE ORIGINAL PIF[6]

Summary of activities/studies conducted during the PPG phase

The Project Preparation Grant (PPG) phase was instrumental in allowing Mexico and the United States to develop and agree on the full scope of the proposal as well as on the mechanisms and use of the GEF TF for delivery of effective results and to maximize Global Environmental Benefits as well as national socio economic benefits. The PPG process was initiated in October 2014 by discussing the GEF review sheet and the STAP comments with the Senior Environmental Specialist in charge of International Waters (IW) projects. Given the scope of the mercury pollution caused by the chlor-akali-plants in the Coatzacoalcos catchment as well as by several other mercury sources in the area and the complex fate and transport modalities of mercury between its organic and inorganic forms, it was agreed that a complementary MSP should be developed to address the issue of mercury pollution in the GoM. This process has been carried out in parallel to the activities supported under the PPG, for the development of the FSP CEO endorsement document for the GoM Strategic Action Programme (SAP) Implementation Project.

Furthermore in response to the GEF review, discussions were initiated with FAO (in its GEF agency capacity with a clear mandate on fisheries management) in order to explore the best possible ways to cooperate in the fishery component of this project.

In addition to extended stakeholder meetings called for by UNIDO and the Mexican and U.S. Focal Points (Mexico City, November 2014 and April 2015; Miami, August 2015), UNIDO facilitated a series of regular teleconferences and missions by national/international consultants to keep parties abreast of progress, to catalyze the process to reach mutually satisfactory agreements, and/or to resolve issues as they were encountered.

From November 2014 to March 2015 national experts were engaged in a consultative process and collected the information required to establish the project baseline against which the project will deliver Global Environmental Benefits (GEBs) and national socio-economic benefits. From May 2015 to December 2015 national consultant were contracted to further refine the logframe and to prepare draft narratives as well as draft budgets. The complete list of inputs, summaries of which can be found at the end of this document (Annex F), included the following technical reports:

Component 1: Improve water quality

- Improving Water Quality in the Gulf of Mexico Large Marine Ecosystem: Narrative, Logframe, Workplan and Proposed Budget
  Yolanda Cachú Pavón
- Land-based Pollution Reduction through TEST Methodology Implementation: Review of National and Gulf States Pollution Data
  Yolanda Cachú Pavón

[6] For questions A.1 –A.7 in Part II, if there are no changes since PIF , no need to respond, please enter "NA" after the respective question.

Component 2: Avoid depletion and recover living marine resources (fish and shellfish)

- Promoting Sustainable Fisheries: Information Review of the Transboundary Diagnostic Analysis
  Álvaro Hernández-Flores
- -Promoting Sustainable Fisheries: Review of Strategic Action Programme Action Line II.B
  Álvaro Hernández-Flores
- FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries: Current Initiatives and Required Actions in the Mexican Fisheries Sector
  Álvaro Hernández-Flores
- Implementation of Fishery Management Plans Supported by the Gulf of Mexico Large Marine Ecosystem Project
  lvaro Hernández-Flores
- US-Mexico Joint Fish Stock Assessments in the Gulf of Mexico Large Marine Ecosystem
  Álvaro Hernández-Flores
- Baseline Information on US and Mexican Fisheries in the Gulf of Mexico Large Marine Ecosystem: Legal Framework, Fish Stock Trends and Economic and Social Relevance of Fisheries
  Álvaro Hernández-Flores
- Climate Change and Fisheries in the Gulf of Mexico Large Marine Ecosystem
  Álvaro Hernández-Flores

Component 3: Conserve and restore the quality of coastal and marine ecosystem through community involvement and enhanced bilateral cooperation

- Conserve and Restore the Quality of Coastal and Marine Ecosystems through Community Involvement
  Paloma Ladrón de Guevara Porras
- Community Education Programmes Focusing on Domestic Wastewater and Solid Waste Sources: Implementation Strategy, Narrative and Annual Workplan for Selected Sties
  Dulce Diana Cabañas Vargas and Yolanda Cachú Pavón
- Restoration of Coastal and Marine Ecosystems through Community Involvement
  Jorge A. López-Portillo Guzmán
- Inter-Agency Coordination Mechanisms in the Gulf of Mexico
  Javier Acevedo Garciá

These inputs were provided to the lead international consultant (IC) who was engaged in August 2015 and tasked with the overall responsibility of developing this UNIDO/GEF6 CEO endorsement document. In order to validate and complement these inputs, and address key recommendations presented to UNIDO in the Final Independent Evaluation of the SAP Development Project[7], the IC carried out a mission to Mexico in November of 2015. The direct engagement with key stakeholders was indispensable to the success and sustainability of the SAP Implementation Project and the one-on-one meetings, facilitated and supported by

[7] "it is critical to secure the active involvement of specific agencies […] in the project and of all government agencies that are part of the CIMARES, especially SAGARPA and in particular its fisheries component" (UNIDO IFE – C. Vignal et al).

the SEMARNAT, effectively reinforced the existing high level of interest and secured participation of all relevant key ministries. As a result, 7 national agencies will partner with UNIDO, assuming full responsibility for project execution and delivery of outputs under their area of competence. This thorough consultative process, supported by the appointed focal points from Mexican institutions, allowed to develop and validate proposals that will contribute to the effective delivery of custom made activities that are directly aligned with the priorities and needs of the country. This approach is expected to facilitate the mainstreaming of project results. During this process, implementation approaches were also assessed, consulted, and will be verified during implementation In the case, for example of the UNIDO TEST methodology, a range of intervention options were identified and 2 main approaches were retained, that of a sectorial approach (sugar mills, slaughterhouses, etc.), or one targeting a representative sample of principal industries.

Although no significant changes in alignment with the original PIF are to be reported, the following adjustments were made in response to the request of the GEF that Component 2 be reviewed (Avoid depletion and recover living marine resources (LMR) (fish and shellfish)), the role of FAO versus that of other Executing entities was defined, and Outputs were reformulated as follows:

- Output 1: Implementation of a joint stock assessment for king mackerel (Scomberomorus cavalla) or Atlantic Spanish mackerel (Scomberomorus maculatus), both commercially significant transboundary species;
- Output 2: Develop management plans in Mexico and the United States for a commercially significant transboundary species using the results of the stock assessment;
- Output 3: Provide technical support to implement an already existing management plan that lags behind in implementation;
- Output 4: Provide technical assistance for the implementation of the FAO Voluntary Guidelines on Small Scale Fisheries for the ecosystem based management of fish stocks in the socio economic context of the Gulf of Mexico.

In addition, countries agreed that the National Fisheries Institute (Instituto Nacional de Pesca - INAPESCA) should become the lead executing agency for this component while FAO will provide technical assistance and backstopping for the execution of this component under an interagency agreement[8] with UNIDO.

The above decisions were communicated to the GEFSEC (August 2015) by the Mexican and U.S. country focal points and it was agreed that further project development should follow these lines. The intensive consultative process with the Mexican and the U.S. focal points, as well as with the focal points of renowned and highly qualified Mexican institutions has resulted in a reallocation of GEF TF between the IW Programs and Focal Area Outcomes. While the PIF foresaw the following allocations:

- US$2,750,000 for the IW-3 Program 5 (Reduce Nutrient Pollution Causing Ocean Hypoxia),
- US$7,400,000 for the IW-3 Program 6 (Prevent the Loss and Degradation of Coastal Habitats) and
- US$2,750,000 for the IW-3 Program 7 (Foster Sustainable Fisheries)

In line with the GEFSEC comments to decrease the budget for component 3 (Conserve and restore the quality of coastal and marine ecosystems through community involvement and enhanced bilateral cooperation), the countries have decided that the following allocations would be better suited to overcome the root causes and barriers identified in the TDA so that SAP goals can be achieved:

- US$5,247,710 for IW-Program 5 (Reduce Nutrient Pollution Causing Ocean Hypoxia),
- US$2,251,295 for IW-Program 6 (Prevent the Loss and Degradation of Coastal Habitats) and

[8] A draft of the interagency agreement which has been developed based upon the inputs provided by FAO during the PPG phase is provided for in Annex H

- US$5,400,995 for IW-Program 7 (Foster Sustainable Fisheries)

This reallocation will support the achievement of the overarching long-term Ecosystem Quality Objective (EcoQO) agreed upon in the SAP, and will also result in higher Global Environmental Benefits as well as in higher national socio-economic benefits.

In intensive dialogue with the Mexican and US focal points in SEMARNAT and NOAA and in line with their mandates and comparative advantages to deliver the outputs to be achieved under the GoM SAP Implementation Project the following governmental entities were retained as Executing Agencies:

Component 1 Improve Water Quality :

- the Mexican Institute of Water Technology (Instituto Mexicano de Tecnología del Agua—IMTA)
- the National Cleaner Production Center—Tabasco Unit (NCPC-TU)
- the Center for Research and Advanced Studies (Centro de Investigación y de Estudios Avanzados - CINVESTAV)
- the National Commission for Knowledge and Use of Biodiversity (Comisión Nacional para el Conocimiento y Uso de la Biodiversidad—CONABIO)

Component 2 Avoid depletion and recover living marine resources (LMR - Fish and shellfish)

- National Fisheries Institute (Instituto Nacional de Pesca—INAPESCA)
- FAO will provide technical assistance

Component 3 Conserve and restore the quality of coastal and marine ecosystem through community involvement and enhanced bilateral cooperation

- the Autonomous University of Yucatan (Universidad Autónoma de Yucatan—UADY)
- the Institute of Ecology (Instituto de Ecología A.C.—INECOL)

Overall the proposed alternative scenario is fully aligned with the PIF and will be delivered via implementation of four complementary and interlinked Components. These were initially introduced in the PIF and as described above, they have been developed, negotiated and approved by the Project partners during the PPG phase. In addition they are consistent with the adopted TDA and SAP, and are designed to collectively deliver the Project's objectives.

A.1. PROJECT DESCRIPTION

Elaborate on: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed; 2) the baseline scenario or any associated baseline projects, 3) the proposed alternative scenario, GEF focal area[9] strategies, with a brief description of expected outcomes and components of the project, 4) incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing; 5) global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF); and 6) innovativeness, sustainability and potential for scaling up.

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[9] For biodiversity projects, in addition to explaining the project's consistency with the biodiversity focal area strategy, objectives and programs, please also describe which Aichi Target(s) the project will directly contribute to achieving..

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1. The Global Environmental Problem

Marine ecosystems and their contributing freshwater basins "are transboundary in nature by virtue of interconnected currents, pollution, movement and, migration of marine living resources" [10] and mismanagement of a large marine and coastal ecosystem has negative impacts on the global environment at a multitude of levels. Excessive fishing, destruction of critical coastal and marine habitats, and nutrient over-enrichment greatly threaten the overall health of the GoM and can potentially affect the countries and populations that depend on it.

The GoM-LME supports major American, Cuban and Mexican fishing industries, a large oil extraction industry and other lucrative economic activities including tourism. The total GoM fishing catches of approximately 1.2 million tons per year, represent 15% and 25% of national commercial landings for the United States and Mexico, respectively, and in a 2014 study, Vidal et al., found that in many coastal communities, fisheries generate an average of 92% of fisher's household incomes. 2013 information indicates that fisheries revenues represent approximately US$1 billion (830,000 tonnes per year), oil and gas revenues total approximately US$77 billion, tourism US$41 billion (77 million tourist per year), and port and shipping total US$0.38 billion (997 million tonnes per year)[11].

Both countries and their economies are strongly tied to the GoM LME and they face, although to different degrees, fisheries related management issues. Amongst these are non-optimal harvesting by commercial fisheries, by-catch, over capitalization and economic inefficiencies, weaknesses in institutions and governance overseeing commercial and recreational harvesting, heterogeneous management strategies and capabilities between countries, limited inter-country exchanges of knowledge and experiences, and incomplete information and understanding of ecosystem functioning, to name a few.

A lack of knowledge leading to poorly informed decision-making among the communities engaged in commercial activities directly linked to the GoM is also evident. This increases pressure on the local communities to further exploit the ecosystem beyond its sustainability limits, in order to maintain their livelihoods. In addition, illegal, unreported or unregulated fishing (IUU) activities cause dramatic shifts throughout ocean ecosystems, slowing or even preventing restoration of depleted fish populations and their habitat.

Other factors threatening the global health of the GoM-LME include eutrophication, harmful algal blooms (HABs) and red tide events; increase of vulnerability to climate change conditions; changes in the biomass, driven mainly by intensive fishing and habitat modification, including loss of critical habitats and connectivity resulting from poorly planned growth in coastal and urban areas throughout the region with subsequent impacts on the life cycles of coastal and marine species.

One of the most serious manifestations of these combined threats, and which both countries experience, are low-oxygen extended events, or hypoxia. The extent of hypoxia on the GoM's northern continental shelf makes this "dead zone" the second-largest manifestation of anthropogenic coastal eutrophication in the world (http://iwlearn.net/iw-projects/1346/reports/gom-lme-tda). Mexican scientists have now demonstrated the existence of other similar zones in the Southern GoM, around the Campeche Sound.

Since the systematic mapping and monitoring of the hypoxia area in the Gulf of Mexico began in 1985, the dead zone size has ranged from between 40 to 22,000 km^2 and averaged 16,700 km^2 from 2000 to 2007. Both countries need to focus not only on the locally identified impacts but also on its transboundary effects and need to agree and prepare joint actions to reduce significantly the hypoxic conditions along the GoM. There is a particularly strong need in Mexico to establish robust, long-term monitoring programs, allocate

[10] Gulf of Mexico Strategic Action Plan
[11] Transboundary Diagnostic Assessment (TDA)

tools, and enhance capacity-building to ensure the reduction of hypoxia impacts, as well as the need for bi-national efforts to develop regional environmental indicators.

Finally, the GoM onshore and offshore area is one of the most important regions for energy resources and infrastructure, representing 85% of Mexico's oil extraction and accounting for 17% of U.S. offshore production of total crude oil and 5% of total natural dry gas production. Over 45% of total U.S. petroleum-refining capacity is located along the Gulf coast, as well as 51% of total natural gas processing plant capacity[12] (http://www.eia.gov/special/gulf_of_mexico/). However, whilst oil production is an important factor in economic and environmental terms, it is not considered under this intervention, as the Mexican and U.S. Governments, following the Deep Water Horizon oil spill, have put in place specific mechanisms to address it.

1.1 Root causes

The TDA identifies the need for a "decisive multinational effort to further enhance the sustainable use of resources as well as to ensure the provision of goods and services to the Gulf's bordering nations". It offers that this new integrated vision must not only take into account biological and physical components alike but, be "spatial, multi-disciplinary, multi-criteria, multi-sectorial, and multi scale". Such a paradigm shift is expected to facilitate the emergence of "conservation science with a social dimension", which not only takes into consideration the need to protect the ecosystems, but promotes the involvement of those managing, utilizing and/or depending on it.

The GoM-LME SAP Implementation Project is designed to support the achievement of this vision and as such will focus on delivering results that directly contribute to the reduction of the negative effects of the root causes identified in the TDA[13] and, actions outlined in the SAP. The basis for the application of the Ecosystem Based Management approach in the GoM-LME (EBM) and its resources was established during the Integrated Assessment and Management of the Gulf of Mexico Large Marine Ecosystem Project (SAP Development Project) and now requires the practical application of interventions to address the root causes and identified gaps, barriers, and constraints in order to promote reforms, investments and development of common mechanisms and tools.

EBM aims to ensure long-term sustainable delivery of services and to define an ecosystem's ability to recover from acute and chronic impacts, while at the same time recognizing that some of the physical, biological, economic and social interactions among the affected components of the ecosystem and attempts to manage fisheries to achieve a stipulated spectrum of societal goals, may be in competition (http://www.st.nmfs.noaa.gov/ecosystems/ebfm/index). In this sense EBM encompasses the array of factors that interact, and the root causes that affect the GoM, and provides a comprehensive management tool. The importance of tackling the root causes of environmental degradation is fully acknowledged by this Project, as is the need to address these at the ecosystem level in order to deliver sustainable, regional and globally relevant results.

Although to date the existing EBM approaches requiring mitigation of the growing anthropogenic threats have been insufficient to address the environmental issues in the GoM - and oftentimes inconsistent with the national policies and programs of Mexico and the United States—it is expected that the Projects interventions will firmly steer the GoM-LME towards a more sustainable path. This will be achieved by implementing 3 distinct but interrelated sets of actions targeting: water quality; avoidance of depletion and recovery of living marine resources; and, conservation of the coastal and marine ecosystem, with each directly addressing root causes and their negative effects.

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[12] U.S. Energy Information Administration – Information and statistics 2014

[13] See the Baseline scenario section for a list of the root causes, and Annex 2 of the SAP for a table of the linkages between project actions and root causes

2. The Baseline – Scenario and Project

2.1 Context

The distinctive geographic and biophysical characteristics the Gulf of Mexico Large Marine Ecosystem (GoM-LME) make it an important global reservoir of biodiversity and one of the most productive of the 66 LMEs in the world. The GoM-LME provides economic wealth, products, food, services, cultural heritage and energy directly to the countries that share it, and contributes to the oceanic biodiversity as a whole. The GoM currently supports approximately 55 million people, 40 in U.S. coastal states and 15 in Mexican ones.

The GoM is the ninth largest body of water in the world and the largest semi-enclosed coastal sea in the Western Atlantic; it is an oval shaped oceanic basin covering 1.6 million km^2, measuring approximately 1,500 km at its widest point and 4,384 m at its deepest (the Sigsbee Deep). Its eastern, northern and northwestern shores span 2,700 km and touch on five U.S. 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 (http://iwlearn.net/iw-projects/1346/reports/gom-lme-tda).

The land that forms the GoM´s coast, including many barrier islands, is uniformly low-lying and characterized by wetlands (marshes, swamps) and straits of sandy beach and river basins draining into the Gulf waters from Mexico and the United States[14], which cover a large proportion of both countries' productive regions. Of the numerous rivers draining into the GoM, the Mississippi and Rio Grande rivers in the northern GoM, and the Grijalva and Usumacinta rivers in the southern Gulf are the most notable.

The GoM-LME is a major asset to its coastal countries in terms of fisheries[15] and seafood processing, tourism, agriculture, oil infrastructure[16], trade and shipping. The GoM-LME is traversed by major shipping lanes, and volume, and shipping value of port activities is on the rise. The five states that make up the Gulf Region in Mexico contribute approximately 10% of the gross domestic product in the agriculture, livestock, forestry and fisheries sectors. The environmental cost of this production, based on national averages is equivalent to 11.8% of the regional GDP, however this figure does not account for the global relevance of the GoM ecosystem.

The oil industry is the single most important economic sector in Mexico and extraction is particularly important in the coastal states of Tabasco and Campeche, whose oil reserves are considered to be amongst the most important in the Western Hemisphere, and prospective activities have located additional potential reserves in the region.

2.2 Baseline scenario

The Governments of Mexico and the United States have over many years demonstrated their commitment to protecting the Gulf of Mexico through a wide variety of policies, programs and initiatives. This said, the SAP Development Project demonstrated that through effectively supported, joint and coordinated actions, ambitious results could be achieved in a shorter timeframe. The Deepwater Horizon Platform MC252 oil spill was a clear example of how the coordination mechanisms established by the SAP Development Project helped facilitate communication and decision making in response to an environmental disaster.

[14] The U.S. portion of the GoM receives water from thirty-three major rivers that drain 31 states (TDA)
[15] Brown, white and pink shrimp, and red grouper represent the most important commercial species
[16] The infrastructure for oil and gas production in the GoM (including oil refineries, petrochemical and gas processing plants, supply and service bases for offshore oil and gas production, platform construction yards and pipeline yards) is concentrated in the coastal regions of both the Mexico and the United States.

The GoM-LME SAP Development Project achieved ambitious results through effectively supported, joint and coordinated actions. The GoM SAP Implementation project will promote the sustainability of the GoM-LME through the implementation of interconnected, interrelated and coordinated sectorial policies. The proposed SAP Implementation Project is fully consistent with, and is supportive to overcome the top transboundary issues identified in the TDA and, supportive of the strategic areas selected by the SAP for intervention - to address the issues identified in the TDA. The provisions of the TDA and SAP have guided the design of the SAP Implementation Project and will further guide the implementation of its 4 Components.

The baseline for the proposed SAP Implementation Project was set by the TDA, and the ensuing SAP validated the priority interventions identified. The nationally appointed Technical Focal Points to the GoM SAP Development Project coordinated the development processes[17], and both documents were negotiated and endorsed by the governments of Mexico and the United States. The TDA is the most recent peer reviewed scientific and technically supported assessment for the GoM-LME that identifies the top priority transboundary issues and determines the baseline for intervention in the region. It provides information on the magnitude, the relative importance of the causes and origins of transboundary problems, and the basis for the identification of preventive and corrective lines of action to ensure the integrated and sustainable management of the LME.

The TDA identifies three key transboundary environmental problems:

1. Pollution including eutrophication and harmful algal blooms (HABs);

2. Habitat modification (wetland loss, connectivity, loss of resilience); and

3. Overfishing of shared, migratory and connected fish stocks.

Nine underlying socio-economic root causes, which need to be addressed:

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

In order to facilitate a greater convergence, and increase capacities to address the major challenges by acting upon the perceived root causes, the TDA proposes 8 Action Areas:

- Capacity building
- Strengthening of the institutional framework
- Strengthening of inter-sectorial planning mechanisms
- Support for development of infrastructure
- Incentives to reduce agricultural run-off
- Common EBM institutional know-how

[17] The Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT) of Mexico and the National Oceanic and Atmospheric Administration (NOAA) of the U.S

- Updated definition of property and use rights for fisheries, and
- Common strategies to address effects of climate change.

In line with the above, the bi-nationally endorsed Strategic Action Programme (SAP) - operational for a period of 5 years starting March 2014 - adopts the following overarching long-term Ecosystem Quality Objective (EcoQO) for the GoM-LME: to "Improve water quality; enhance economic vitality by avoiding depletion and recover living marine resources; and conserve and restore coastal and marine ecosystems".

The SAP further states that achieving this EcoQO will allow the region to ensure societal benefits as "The provision of goods and services by the marine ecosystems of the GoM-LME are such that they optimize the systems' contributions to societal well-being and to the region's development needs" (including the preservation of aesthetic, cultural, traditional, health and scientific values of the ecosystems).

2.3 Existing challenges

As recognized by Mexico and the United States in the SAP, controlling and reducing pollution, recovering living marine resources and, rehabilitating marine & coastal ecosystems, are the main challenges to be addressed for the protection and conservation of the GoM-LME living marine resources. The overarching social dimension is also reviewed below as the direct effects of the tree main threats have very direct and real effects on the population and country as a whole.

Mexico's *Economic and Ecological Accounts*[18] offer a stark assessment of the direct environmental impact of economic activities on depletion of natural resources. Although the costs of environmental degradation have steadily declined since 2003, where they represented 8.5% of the Mexican GDP, for 2013 they were at 5.7% of GDP which stood at approximately US$1.26 trillion; this is equivalent to US$71,820,000,000. (http://www.inegi.org.mx/prod_serv/contenidos/espanol/bvinegi/productos/nueva_estruc/702825068752.pdf)

2.3.1 Pollution

Pollution directly related to economic activities represents one of the principal anthropogenic threats to the coastal areas of the GoM[19]. The discharge of untreated domestic and industrial waste water, compounded by fertilizer and pesticide laden runoffs from agricultural and livestock activities, negatively affect the quality of surface and groundwater, putting at risk the health of the population and the integrity of ecosystems. Pressures from rising coastal populations include increased solid waste production (i.e., plastic waste has also emerged as a dominant global marine pollution problem on the basis of its widespread impacts and its durability), higher volumes of urban, industrial, agricultural point and non-point runoff, and the generation of industrial residues. Pollution in general is recognized as a threat to the GoM's biodiversity, and monitoring in the United States and Mexico confirms that in a significant number of sampling stations, concentrations of pollutants frequently exceed the acceptable limits established in water and sediment quality guidelines.

Contaminants generated by cities, agriculture and industry are transported and introduced into the marine environment by rivers, underground water, erosion, and wind, and threaten all living organisms. According to the 2010 UNEP Caribbean Environmental Program report on land-based sources of pollution to the Wider Caribbean Region (WCR), almost half (49%) of domestic wastewater inputs to the WCR comes from the GoM. The discharge of raw or partially treated wastewater into the GoM is a significant part of the problem,

[18] Published yearly by the National Institute of Statistics and Geography (INEGI)
[19] Pollution and Ecosystem Health Thematic Report TDA 2012

particularly in Mexico, as urban sewage (including that from small and medium sized industries[20]) often contains not only organic matter and pathogens, but also hydrocarbons [21], metals, pesticides, pharmaceuticals and personal care products.

Of these, Persistent Organic Pollutants (POPs) are a high level concern (covered by the Stockholm Convention) and include many compounds that still are, or were in the past used as pesticides, solvents, pharmaceuticals, and industrial chemicals. Pesticides are of particular concern with elevated levels of legacy compounds (such as organochlorines) still present in many coastal ecosystems. Metal pollution, another significant environmental concern, originates from industrial waste, urban runoff, incinerators, mining and oil drilling activities; amongst these mercury, one of the main causes of fish and shellfish consumption alerts. Adding to this, emerging compounds[22] such as human and veterinary pharmaceuticals, personal care products, brominated flame-retardants, new classes of detergents, etc. are entering the GoM and at this stage, little is known about them or their effect on the marine environment.

The fact that few wastewater treatment plants are designed to remove these pollutants, and stop them from entering the coastal and marine environment, strongly supports strengthening and updating not only of wastewater treatment plants, but of industrial processes discharging into these as well.

Point and non-point runoff pollution is also a significant threat to biodiversity, and the greatest pollution threat to coastal marine life is found in runoff of excess nitrate – nitrogen and phosphate from different sources. This nutrient over-enrichment from discharges into the Mississippi river results, for example in another one of the largest hypoxic zones in the world (over 18,000 km^2), and further south in another at the mouth of the Grijalva-Usumacinta watershed. The reduction of ocean hypoxia or "dead" zones in coastal waters is one of the GEF's International Water Priorities.

2.3.2 Overfishing of shared, migratory and connected fish stocks

To understand fisheries in the GoM-LME, one must first realize that Mexico does not have a historic tradition of navigation or of oceanic fishing, and to put things into perspective, before the 1970s, landings represented less than 100,000 metric tons per year. However, starting from 1970, the government focused its attention on strengthening this sector and prepared guidelines that were implemented with the support of centralized governmental institutions. This period saw the creation of the Under-Secretariat of Fisheries of the Agriculture Ministry and, consolidation of the National Fisheries Institute (INAPESCA), to provide technical and scientific advice. In 1972, the Mexican Congress approved the Federal Law for the Promotion of Fisheries, and the government created the PROPEMEX, a parastatal or state-owned enterprise to promote the development of the processing sector and to facilitate access to markets for fisheries products. In 1976, the new administration in turn created a new structure, the Fisheries Ministry, which supported by an expanded budget, channeled more resources to this sector. During this period the United States and Mexico joined the UN Convention on the Law of the Sea, recognizing the exclusivity of their respective EEZs. It is also during this period, that the Mexican government specifically sought to increase landings by simplifying

[20] Wastewater from economic activities generated by SMEs, such as small industries or service businesses, located in urban centers, falls into the "domestic discharge" category (according to the Cartagena Convention). This is discharged into the urban or rural sewerage system and is treated in municipal wastewater treatment plants

[21] Although hydrocarbon pollution is generally associated with the oil industry, this is also introduced into the marine environment by urban runoff, vehicle exhaust, forest and grassland fires, etc.

[22] These can be broadly defined as any synthetic or naturally occurring chemical, or any microorganism not commonly monitored in the environment - but which has the potential to enter the environment and cause known or suspected adverse ecological and (or) human health effects (USGS Environmental Health and Toxic Substances, 2015)

procedures, creating laws, and facilitating the access to subsidies for a sector now loosely comprised of cooperatives and private firms.

Although initially this policy promoted investments in industrial vessels and processing plants it also promoted small-scale fisheries in coastal villages in the coastal states of the GoM. The trigger policies induced thousands of unemployed field workers to migrate toward coastal states and in particular ports, and by 1984 total landings had reached almost 325,000 metric tons (Hernandez & Kempton, 2003). Ultimately the policies that promoted accelerated growth did not anticipate the magnitude of the fishing effort that would have to be controlled in the future as in 1995, only ten years later, 97% of effort was from artisanal boats, and only 3% from industrial vessels.

This situation also led to an increase in settlements in coastal areas including lagoons, and impacted marine and coastal ecosystems and fishing areas, which had been reduced as a result of industrial expansion (oil sector) and/or the classification of some coastal lagoons to protected areas, with the expected social, political and economic conflicts. In the 1990s, the situation in many small-scale fisheries was a typical picture of open access fisheries regimes. Low stock levels, an above optimal number of fishers, reduced revenues, no incentives to conserve the resource, race-to-fish, and capital's capacity that exceeded the resource's capacity were some of the symptoms (Hernandez and Kempton, 2003).

However, from a purely financial perspective, the effort to stimulate the sector was remarkable and resulted in a constant +3.7 % annual growth rate in landings until 1995, when it reached a peak of 375,000 metric tons (which does not necessarily correspond to the "maximum sustainable yield"[23]). From a biodiversity and natural resources perspective, since then, and in spite of continued policy efforts, landings saw a systematic and constant annual decrease with current production now at 222,000 tons, (a downward annual trend of -3.7%).

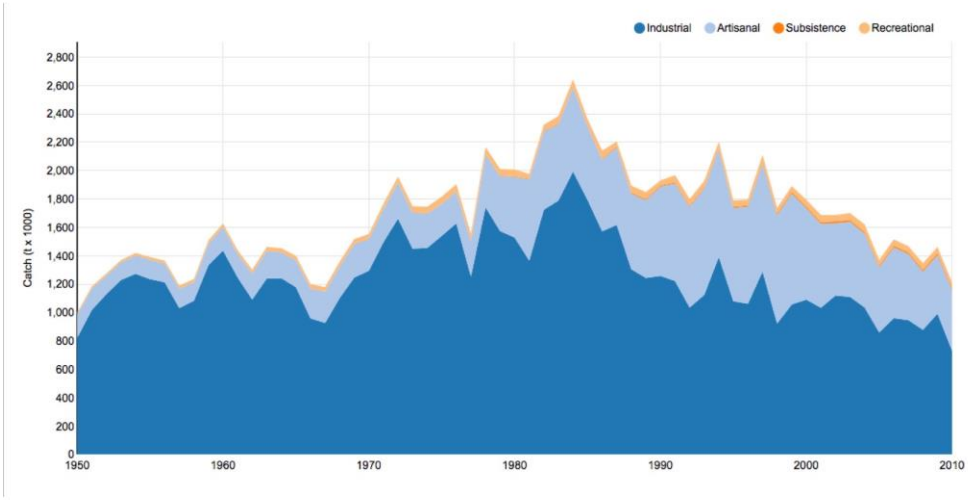
In the United States, from the 1940s to the 70s, most of the landings came from the fleets of high seas fishing vessels, mostly from other countries, in different parts of the GoM. In 1976, the Magnuson-Stevens Fishery Conservation and Management Act (the Act) extended U.S. territorial boundaries out to 200 nautical miles and gave the United States sole authority over most of its continental shelf. As a result, new policies were implemented that sought first to increase fishing efforts and then landings, which after 1976 began to soar. From 1973 to 1984 significant annual increase rates of +5.3% were recorded, with the highest landings weighing in at 1,000,424 metric tons (1985).

After the approval of the Act, Fisheries Management Plans (FMP) began to show the true state of fisheries, and policies moved towards the conservation of marine resources and control of fishing mortality to sustainable levels through quotas. The adjustment policies began in the early 1990s, and the results were observed starting from 1995. In 2011, commercial landings in the U.S. GoM reached 816,000 metric tons of fish and shellfish (3.7 times the production of the Mexican GoM). Landings revenue was dominated by shrimp ($438 million) and menhaden ($104 million), and these species comprised 66% of total landings revenue, and 90% of total landings in the GoM region. During the 1995-2013 period, the trend in fishery landings stabilized at around 770,000 metric tons, with a slow annual decrease rate of – 1%.

[23] Total landings are good indicators of trends in exploitation of marine living resources, but these have to be considered as aggregated data from all fisheries occurring in the area, including oceanic and coastal species. It is therefore considered likely that the highest landings in 1995 are related to the natural capacity of living resources exploited, mainly in the coastal areas by small-scale fisherfolks, but also some pelagic and oceanic resources exploited by industrial vessels. Trends in landings are explained by different phenomena, both natural and social and although an analysis by fishery would be more rigorous -but extremely cumbersome- the more general approach based on landings can hence be considered as a good indicator of the situation of living resources in the GoM (Hernandez, 2015)

This Act has been amended over the years, and in 1986 for example sovereign rights over fish in the EEZ were established, as well as new requirements for habitat conservation, along with a revision of the FMP process. By 1995 the regional councils had implemented 34 management plans (Cicin-Sain and Knecht, 2000). From then began a process of continuous evaluation of FMPs, which culminated in a report on the biological health of U.S. living marine resources: “Our Living Oceans”, which since 1991 have presented an overview of the principal fishery resources in the eight Regional Fishery Management Councils of the United States.

When the United States identified the fragility of marine resources in early 1990s, the government developed policies and measures to ensure accountability aimed at restoring depleted resources through programs that have yielded positive results, and the number of depleted stocks is shrinking yearly. Although this does not mean that similar actions will produce the same results on the Mexican side of the GoM, cooperation and international assistance that considers the sociocultural and economic realities of each country is expected to facilitate actions in support of the recovery of depleted marine stocks.



Catches by Fishing sector in the waters of the Gulf of Mexico (www.seaaroundus.org)

The situation in Mexico is considered to be critical as regards fisheries production, which in turn represents a risk to the welfare of thousands of families, given in particular that in coastal communities, fisheries generate an average of 92% of fisher’s household incomes (Vidal et al., 2014). Even though household-level economic indicators have been poorly estimated for coastal communities, the contributions of fishing related activities are key to food security, coastal livelihoods and poverty alleviation. Fishing, oftentimes referred to as subsistence fishing, is a major source of food and employment for thousands of families along the coast; on the Mexican side of the GoM there are approximately 94,000 fishers (SAGARPA, 2013), and for the U.S. GoM, the number is of approximately 150,000 (National Marine Fisheries Service, 2014). One estimate offers that artisanal fishers potentially support up to 75.5% of the coastal population of the GoM-LME. The difficult situation of small-scale fishers in the GoM is compounded by uncertainties including the ecological and biological characteristics of the resources, climatic conditions, and economic and market situations, and exacerbated by the over-exploitation of resources.

2.3.3 Habitat degradation and modification

The high productivity in the GoM is mainly due to mangroves, coral reefs, seagrass meadows and estuarine lagoon systems (e.g., Zimmerman et al. 2000; Vázquez-González et al. 2015). Such productivity is paired with a high biodiversity, since 90% of the marine species are distributed in these shallow habitats. A clear link has been established between coastal productivity and fisheries and many other ecological services can be documented. However due to their easy accessibility, these habitats are subjected to multiple pressures. Resources are used to generate financial returns faster than they can regenerate so the risk is that such financial returns are short-lived, posing a threat to the sustainability of local and transboundary economies and communities.

Mangroves are at the interface between the land and the sea (the ecotone), and their productivity adds to the food web chain of the costal lagoons and the sea. Mangroves enhance fish production by the provision of food and of shelter and are considered as a nursery habitat and breeding ground of many aquatic species; their value for fisheries has also been documented (Aburto-Oropeza et al. 2008). Mangrove ecosystems are highly productive, their leaves and woody matter (detritus) form a key part of the marine food chains that supports fisheries. Mangroves often benefit from incoming nutrients from rivers and other adjacent habitats, they may also export nutrients, in the form of dissolved and particulate organic carbon, and living biomass, such as planktonic larvae and maturing fish and invertebrates (Hutchison, et al., 2014).), and they play an important role as natural limits to industrial, touristic, urban and rural growth and as protection against hurricanes and tsunamis (Dahdouh-Guebas et al., 2005).

In an estuarine lagoon system diversity and productivity thrive along gradients of salinity and nutrients in the succession from freshwater to brackish to salt water communities: flooded forests, broad and narrow leaf marshes, reeds, mangroves, seagrasses that tolerate varying degrees of salinity, and coral reefs. This habitat heterogeneity accounts for the high diversity of organisms, from producers to consumers and detritivores, some of them important in commercial, sporting and local fisheries. However, loss of connectivity due to habitat fragmentation reduces productivity and affects the health of coastal environments (Ortiz-Lozano et al. 2005; Camacho-Ibar and Rivera-Monroy 2014).

Dredging of the lagoon floor to form navigation channels or to increase depth is a costly operation that is frequently carried out when fisherfolks complain about low fish captures. Instead of monitoring commercial or artisanal fish captures to assess the effects of (over)fishing, dredging and building of jetties at the inlet of the lagoons are common practice. Generally, the dredge sediment ends up covering other plant and floor communities, affecting oyster banks and seagrass beds (Sotelo Giner 2015) and are also frequently used to fill wetlands that are then reclaimed by land owners as part of their property. Dredging frequently coexists with fishing within coastal lagoons. Since fishing resources are dwindling but the catching effort is maintained or increased, fisherfolks resort to illegal techniques that include the trawling of the lagoon floors, homogenizing them and reducing the sites available for the establishment of sessile organisms, such as seagrasses, annelids and mollusks (Escobar-Briones 2004), and changing fish species composition. This has been documented for open seas (Thrush et al. 2006; 2015) but few studies are available for coastal lagoons (Sosa-López et al. 2005). However it is accepted that continuous disturbance of the lagoon floor results in loss of biodiversity, which in the long term affects fish populations - “changes in habitats will affect the average sustainable yield” (From Ridge to Reef – GEF 2015) and under these changed conditions it has been observed (Gulf of California) that “fisheries shifted from large, long-lived species belonging to high trophic levels to small short-lived species from lower trophic levels” (Sala et al. 2004).

The functions of seagrass beds have generally been under-evaluated. These marine flowering plants are important primary producers and they serve either directly or indirectly as a food source for large number of marine organisms. The direct consumption by green turtle and manatees is an important route of energy flow through the system. The bulk of the production of the seagrasses are also available to marine worms, small snails, spiny lobsters, crabs, fish, etc. via decomposition of dead mater. Seagrasses function as natural retention area and stabilizers of sediments. The presence diminishes the movement of large masses of sediments and contributes to the reduction of erosion of beaches. It also provides habitat for a large number

of organisms. Small fishes and crustaceans graze the seagrass for food, where at the same time, they find shelter from their predators between densely packed leaves. The leaves serve as a substrate for many sessile plants and animals. In addition, seagrass beds are important nursery grounds for juveniles of commercially important fish, spiny lobster and shrimp.

Coral reef and seagrass environments are also exposed to overexploitation as well as pollution and sedimentation from continental discharges. Seagrass meadows, together with mangrove swamps and tidal marshlands, are important natural marine carbon sinks, mitigating the effects of global climate change (van Tussenbroek et al., 2010). On a greater scale, climate change is contributing to the acidification and increasing mean temperature of the oceans causing structural and functional changes in the shallow ecosystems, recently also reported for Caribbean coral reefs (Eakin et al. 2010).

2.3.4 Social

In addition to the environmental problems described above, the Mexican Gulf region has experienced social and economic changes in recent years. These changes have significantly affected the contribution of primary sector activities to the GDP, which have fallen from 15-20% to 4-10%[24]. Sectors whose growth could result in expanding employment (such as tourism, services and trade) are not growing at the expected pace. On the other hand, low-wage, informal employment and unemployment have grown markedly.

Countering this trend requires the promotion and support of alternatives that expand opportunities for economic development, and generate employment and investment in programs that sponsor the regulated use of natural resources, while at the same time promoting the protection of threatened ecosystems (coastal lagoons, mangroves, seagrass beds, sand dunes) and species depending on their continued and sustainable existence.

2.4 Baseline project

The efforts and projects implemented by the governments of Mexico and of the United States aimed at monitoring and reducing the impact of anthropogenic activities on the GoM-LME are numerous. Although these have not yet delivered the long-term sustainable results to ensure the full recovery of the GoM, they all address to different degrees, the perceived major problems identified by the TDA.

With regard to México, the following National Development and Sectorial Plans support the non-GEF activities introduced below.

2.4.1 Baseline project of the government

The National Development Plan establishes the national objectives, strategies, and priorities of the current Mexican administration; it sets forth five national goals and three transversal strategies that all policies of the Federal government must include. Environmental issues are included under the fourth goal, which promotes green economy to preserve the country's natural capital while creating wealth, competitiveness and jobs.

The Sectorial Program on Environmental and Natural Resources 2013-2018, in line with the National Development Plan, aims among other things at the recovery of watershed functionality through conservation, restoration, and sustainable development of the natural capital under Objective 4. It also aims to capitalize on the international agenda focused on ensuring the protection, conservation and sustainable development of the ecosystems, their biodiversity and environmental services.

The National Biodiversity Strategy Action Plan (NBSAP, 2000), in process of actualization to take account of

[24] Socio Economics Thematic Report - TDA

the Aichi goals, established four strategic lines that will help to accomplish objectives under the Convention for Biological Diversity, placing the preservation of ecosystems among the top national priorities.

The Special Program on Climate Change (2014-2018) groups 14 sectorial programs seeking to reduce GHG emission and incorporate adaptation and mitigation measures. It addresses the reduction of population's vulnerability in risk areas, preservation of ecosystems, reduction of greenhouse gas emissions, and population's vulnerability in risk areas, preservation of ecosystems, reduction of greenhouse gas emissions, and pollutants of short life by working with major emission sectors, such as transport, oil, gas, industry, agriculture, electricity and wastes.

There are other policy instruments related to the objectives of the project such as the National Strategy for Invasive Species, the National Rector Program of Fisheries and Aquaculture, the National Policy for the Sustainable Development of Oceans and Coasts of Mexico, the Marine and Regional Sea Use Planning for the Gulf of Mexico and Caribean, the Regional Plan of Action for the Yucatan Peninsula RPA-YUCATAN and others that will be refered below.

Mexico has made important advances in consolidating its environmental policy, and the past and current administrations have placed importance on mainstreaming of the environment through cross-sector planning and budgeting.

With regard to national policies, Mexico's National Development and Sectorial Plans for the 2013-2018 period also prioritize activities to improve water quality, restore living marine resources and coastal ecosystem. Mexican Technical Standard NMX-AA-159-SCFI-2012 establishes the procedure for environmental flow determination in hydrological basins, in particular ecological relevance and intensity of demand. The Official Mexican Standard for wastewater discharges NOM-001 at regional level (priority hot spots) is currently under review. It is expected that it will be approved mid-2016 and would enter into force end-2016. The new Standard will improve the water quality of receiving bodies in the medium term, a series of indicators will be proposed to measure the changes. This will lend strong support to the proposed project.

The baseline for Policy Framework investments in Mexico, in the absence of GEF funding is estimated at US$**8 million**.

2.4.2 Improving water quality

As part of its mandated activities, the National Water Commission of Mexico (Comisión Nacional del Agua—CONAGUA) of the Ministry of Environment and Natural Resources (Secretaría de Medio Ambiente y Recuros s Naturales—SEMARNAT), will continue to monitor basic parameters and report on beach water conditions for recreational purposes. The measurement of additional parameters stemming from the updated Norm (expected to enter into force end of 2016) will be covered, however this will require significant effort to bridge the equipment gap, and time. Harmful algal blooms will also be reported and monitored by the Federal Commission for the Protection Against Sanitary Risk (Comisión Federal para la Protección Contra el Riesgo Sanitario—COFEPRIS), although no systematic information sharing protocols are in place for this with the United States In the absence of an ecosystem approach, agricultural run-off and nutrient loading will continue to be viewed as a result of seasonal fluctuations in the Gulf.

Water sanitation and treatment facilities will continue to be built and operated by CONAGUA and municipalities. In the United States the Action Plan on hypoxia will continue to be implemented in the Mississippi Delta, however in the absence of GEF support, Mexico will have no systematic way to assimilate relevant knowledge generated in the United States and to replicate it in relevant programs such as the RPA-YUCATAN (see below).

Data integration and monitoring systems, which will continue to operate, include:

- The National Interactive Atlas (Atlas Nacional Interactivo de México—ANIM http://www.atlasdemexico.gob.mx/inicioweb.html) of the Mexican National Institute of Statistics and Geography (Instituto Nacional de Geografía e Informática - INEGI);
- The Navy Ministry (Secretaría de la Marina—SEMAR) National Oceanographic Information Archive (Archivo de Información Oceanográfica Nacional—AION) launched at the end of 2015, and including oceanographic, meteorological, atmospheric and environmental data from Mexican institutions and research centers including Mexican Petroleum (Petróleos Mexicanos—PEMEX), CONABIO, CINVESTAV, the Ensenada Center for Higher Education and Scientific Research (Centro de Investigación Científica y de Educación Superior—CICESE), the National Autonomous University of Mexico (Universidad Nacional Autónoma de México—UNAM), the National Polytechnic Institute (Instituto Politécnico Nacional—IPN), among others;
- The National Center for Oceanographic Data (http://cendo.ens.uabc.mx/), collecting oceanographic data and developing indicators of ocean health, in collaboration with the United Nations Educational, Scientific and Cultural Organization (UNESCO) initiatives (Intergovernmental Oceanographic Commission (IOC), International Oceanographic Data and Information Exchange (OIDE) and Ocean Data and Information Network for the Caribbean and South America region (ODINCARSA));
- The Integral Clean Beaches Program (Programa Playas Limpias) implemented in 2003 as certification procedure for recreational water quality activities.
- The Marine and Coastal Information System of CONABIO (http://www.biodiversidad.gob.mx/pais/mares/)

The state-owned PEMEX will continue to operate its environmental management and industrial security program, including pollution mitigation practices, emergency protocols and restoration, currently under supervision of the recently created (2014) National Agency for Industrial Safety and Environmental Protection of the Oil Sector (Agencia de Seguridad, Energía y Ambiente—ASEA) and will continue to prepare its National Implementation Plan for the Stockholm Convention on POPS, including abatement measures for unintentional releases. This region has been selected for a pilot project for the Global Plan of Action (Regional Plan of Action for the Yucatan Peninsula RPA-YUCATAN), and close cooperation with the GoM project is foreseen.

Gaps addressed by the SAP Implementation Project

Component 1 focusing on improving water quality will contribute to addressing the root causes related to wastewater treatment needs, pollution control and capacity building, and to the reversal of the observed trends in pollution loads. In addition these interventions, including the implementation of pollution reduction strategies, will support the remediation of eutrophication and harmful algal blooms. Without GEF funding support, opportunities for synergistic efforts would be missed.

The baseline for Pollution related investments in Mexico, in the absence of GEF funding, is estimated at US$**100 million.**

2.4.3 Avoiding depletion of marine resources and sustainable livelihoods

In 2006, SEMARNAT adopted a National Environmental Policy for the Sustainable Development of Oceans and Coasts (NEPSDOC), which established public policy guidelines and strategies in an effort to reinforce integrated environmental management of the coastal zone through structural reform, effective inter-institutional coordination and wide ranging public participation. As a result of the NEPSDOC an Inter-ministerial Commission for the Sustainable Management of Coast and Seas (Comisión Intersecretarial para el Manejo Sustentable de Mares y Costas—CIMARES) was created by the Federal Government and formulated several strategies and policies, however, the implementation of those intersectorally coordinated

policies is still in progress. It is expected that in the absence of GEF support, the full engagement of the different actors that comprise the Commission will be a major challenge.

Mexico published a National Fisheries Chart in 2000 and although new versions were published in 2004, 2006, 2010 and 2012 this has not been fully updated, and as a result, several fish stocks have now been listed as depleted. Most recently, fundamental modifications have been introduced in relevant official standards, and it is expected that further fine-tuning of the legal and policy framework will continue to take place. However in the absence of GEF support, it would be unlikely that an LME harmonized policy framework between Mexico and the United States, or even between the Mexican Federal Government and the State and Municipal governments, would be rapidly achieved.

SAGARPA currently provides support that can be enhanced to coastal communities (http://www.sagarpa.gob.mx/ProgramasSAGARPA/Paginas/default.aspx) in the form of extension programs, rural aquaculture initiatives, and subsidized seeds, fertilizers and other inputs for subsistence farming (Integrated rural development program, Promotion Programme for fisheries and aquaculture productivity, Promotion Programme for agriculture, among others).

In spite of the limited support for rural aquaculture, there is no concerted institutional effort in place to provide alternative income to rural coastal fisher communities, other than for fishing activities. CONAFOR operates a number of subsidy programs principally for reforestation and commercial plantations, and is the main financial source for restoration of ecosystems (http://www.conafor.gob.mx/web/apoyos/apoyos-2015/).

PEMEX through the National Indigenous Commission and other institutions provides some support for productive alternatives in agriculture (Program to improve indigenous production and productivity, http://www.cdi.gob.mx/focalizada/2014/proin/index.html).

CONANP regulates productive activities in the buffer and influence zones of the region's protected areas by providing financial support (subsidies), through programs such as the Temporary employment program (Plan de Empleo Temporal—PET), the Program of payment for environmental services (Plan de Servicios Ambientales—PSA) and the Community program for sustainable development (Programa de Conservación para el Desarrollo Sostenible—PROCODES) (http://www.conanp.gob.mx/acciones/). However the management plans for protected areas are not necessarily linked to potential financiers, and full stakeholder participation in the identification of these productive alternatives is still somewhat limited, in spite of important efforts in public outreach and awareness-raising.

Gaps addressed by the SAP Implementation Project

Component 2, which focuses on avoiding depletion and facilitating the recovery of living marine resources, will contribute to strengthening and implementing the legal framework to promote ecosystem-based management for the fishery sector and in so doing will 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.

The baseline for Sustainable Livelihood investments in Mexico, in the absence of GEF funding is estimated at US**$15 million**.

2.4.4 Rehabilitating coastal and marine ecosystems

The National Commission for Natural Protected Areas (Comisión Nacional de Áreas Naturales Protegidas—CONANP) as part of its mandate and according to the National Program for Protected Natural Areas will continue to designate protected areas, including for example special reserves such as the soon-to-be announced expansion of the Yum Balam (largely land-based) reserve to be integrated into a single reserve, encompassing the marine sanctuary of Holbox Island and its emblematic whale shark species.

INAPESCA is in charge of the fisheries stock assessments and the formulation of Fisheries Management Plans (FMP). CONAPESCA is in charge of the instrumentation of those FMP through fisheries regulation.

INAPESCA will continue the formulation of FMP´s and CONAPESCA will instrument these, in line with available budgets and human resources.

SEMARNAT, CONABIO, CONAFOR, CONANP and other environmental institutions are actively involved in the restoration of wetlands, particularly mangroves; their activities are coordinated through the National Wetlands Committee. CONABIO integrates information relative to the extension, distribution, priority sites, and cartography and restoration projects. CONAFOR supports projects for the restoration of wetlands through its PRONAFOR program. CONANP also promotes and supports restoration projects.

PEMEX will continue investing in the implementation of some management plans for those protected areas in the company's operational zones such as Pantanos de Centla and Laguna de Términos.

PROPEFA will continue with the inspection and surveillance of forests, marine wildlife, marine resources, coastal ecosystems and environmental impact and federal maritime terrestrial zones (including natural protected areas) for the protection of marine protected species (http://www.profepa.gob.mx/innovaportal/v/252/1/mx/recursos_marinos.html).

The National Forestry Commission (Comisión Nacional Forestal - CONAFOR) will also continue supporting wetlands and particularly mangrove restoration efforts under its National Forest Program. This will however not take completely into consideration strategic factors such as the ecosystem based approach and hydrologic flux rehabilitation, but mainly plantations and reforestation. CONANP will also work on the Convention of Wetlands of International Importance (Ramsar Convention) in consistency with national policies, but in the absence of GEF support the restoration of mangroves will be conducted with the limited existing resources. In addition, it is unlikely that productive marine ecosystems would be established for the GoM region other than for biodiversity (coral reefs) or keystone species consideration.

Gaps addressed by the SAP Implementation Project

Component 3, which focuses on conservation and restoration of the coastal and marine ecosystem 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 more precise legal and technical definitions. Promoting awareness raising, and dialogue with and between key stakeholders will ensure that ecosystem concerns and externalities beyond a certain sector are taken into consideration in planning and management.

The baseline for Habitat Conservation and Restoration investments in Mexico, in the absence of GEF funding is estimated at US$**21 million.**

2.4.5 Baseline projects for regional coordination efforts and support from financial institutions

Mexico (11 April 1985) and the US (31 October 1984) have both ratified the Cartagena Convention (1986) for the Protection and Development of the Marine Environment of the Wider Caribbean Area under which members are required to take action aimed at preventing, controlling and reducing pollution of the Convention area. Joint efforts to implement this convention go back to 1992 when the Mexican Secretariat of Urban Development and Ecology (SEDUE) and the US Environmental Protection Agency initiated a bilateral project to reduce marine pollution.

Bilateral activities will continue to be carried out in the GoM on a wide-ranging number of issues including wildlife, habitat, shipping, petroleum industry-related emergency contingency plans, shared watersheds, etc. (GoM States Agreement "GOMSA", Treaty for the Mexico-US border 2012, Fisheries Research Program MEXUS-Gulf, US-Mexico Plan to Respond to oil spills "MEXUSPLAN", among others, Evelia-Rivera, 2004).

Nevertheless, these efforts are predominately sectorial in nature, and do not necessarily contemplate a shared approach, nor do they provide an enabling environment for synergies through the ecosystem approach.

The baseline for investments in Regional Coordination Efforts in Mexico, in the absence of GEF funding is estimated at US$**20 million**.

Regarding coordination mechanisms in Mexico, the Inter-Ministerial Committee for the Integrated Management of Oceans and Coasts (Comisión Intersecretarial para el Manejo Sustentable de Mares y Costas—CIMARES), the National Coordinating Commission for Oceanographic Research (Comisión Nacional Coordinadora de Investigación Oceanográfica—CONACIO), the GoM, Sea-Use-Planning Committee (GoMSUPC), and the Consortium of Marine Research Institutions of the GoM and Caribbean (Consorcio de Instituciones de Investigación Marina del GoM y del Caribe—CIIMAR-GOMC) are of particular relevance for the region. These mechanisms contribute to ensuring the adoption of best management practices and support the goal of sustainable development of the region by providing sound scientific knowledge to decision-makers and formulating and instrumenting policies, plans and strategies.

The above actions are supported in part through international projects such as SEMARNAT´s conservation of coastal watersheds in the context of climate change; the World Bank project on adaptation of the Gulf of Mexico´s coastal mangroves to the impacts of climate change; the IADB project on adaptation, land use, and integrated management planning for the Grijalva and Usumacinta watersheds; to name a few.

These activities are in line with GEF-6 International Waters Objective 3 – Program 3.2 Preventing the Loss and Degradation of Coastal Habitats. The project will also take into account lessons learned from the GEF-funded project on Enhancing National Capacities to Manage Invasive Alien Species as well as Mexico´s National Strategy for Invasive Species to apply policies and best practices for managing invasive species.

Likewise, the National Strategy on Climate Change and the Climate Change Special Program will serve as the basis for coordinating local, state, and federal efforts by verifying actions and measures to reduce the vulnerability to the impacts of climate change and emissions of greenhouse gases from natural and human systems according to the State Programs of Action on Climate Change.

The identification of the activities to be supported under the proposed SAP implementation project was informed by the SAP long term vision[25] as well as by the provisions of the Cartagena Convention to protect the marine environment of the wider Caribbean region for the benefit and enjoyment of present and future generations.

The proposed components will support the cooperation between Mexico and the US in the implementation of measures pertaining to Article 7 Pollution from Land Based Sources and Article 10 Specially Protected Areas of the Cartagena Convention to prevent, reduce and control pollution and ensure sound environmental management.

Activities to be implemented under Component 1 Improve Water Quality and under Output 3.1 Community Education Programs focusing on domestic waste water and solid waste sources will contribute to prevent, reduce and control pollution by coastal disposal or by discharges emanating from rivers, estuaries, coastal establishments, outfall structures (Art. 7).

Activities to be implemented under Output 3.2 Community Based Wetland Restoration in Selected Sites and under Output 3.4 Support the Effectiveness of Marine Protected Areas by Linking them into Networks will contribute to protect and preserve rare or fragile ecosystems, as well as the habitat of depleted, threatened or endangered species (Art 10).

As presented in the table below the total forecasted baseline expenditures amount to approximately US$164

[25] A healthy and resilient Gulf of Mexico where coastal communities enjoy high standards of quality of life and the region's socio - economic activities are competitive and sustainable. Likewise, the region's natural resources, biophysical structure and landscape quality provide environmental services that halt threats and reduce vulnerability of the population and infrastructure.

million.

Issue	Detail	Cost US$
1	Policy Framework	8,000,000
2	Pollution	100,000,000
3	Sustainable livelihoods	15,000,000
4	Habitat conservation and restoration	21,000,000
5	Regional coordination efforts	20,000,000
	Total Forecast Baseline Expenditures	**164,000,000**

2.5 Barriers to be addressed

The political complexity of the GoM-LME region and the economic differences between the bordering nations are significant barriers to be addressed. Changes of federal administrations are rarely in synchrony, requiring strong efforts from within the federal staff to maintain productive partnerships after each election, or as a result of cabinet reshuffles. The institutional arrangements for each country also differ greatly.

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 land use and some types of permitting in the coastal zone. In the United States, the Federal Government has jurisdiction over the U.S. Exclusive Economic Zone (EEZ), which extends 200 nautical miles offshore. The five States bordering the Gulf of Mexico have jurisdiction over state waters inside of the U.S. EEZ.

The relatively low awareness of decision makers and of the general population regarding the impacts of economic activities on the sustainability of the GoM-LME is one of the greatest barriers to the introduction of the necessary management changes. Poor entrepreneurial culture among fisheries, especially artisanal fisheries non-compliant with set quotas and limitations, endangers and is particularly damaging to the ecosystem through overfishing of stocks. In order to increase project replication and thereby increase the pool of target beneficiaries, the Project will vigorously pursue an approach based on demonstration and awareness raising of best environmental practices.

A limited dialogue between the government and the private sector, as well as other key stakeholders such as policy makers and the local communities, hinder the effective implementation of an EBM approach. Industries, in particular the fishing industry – directly responsible for fish stock depletion; as well as the manufacturing, tourism, and industries responsible for wastewater discharges into the GoM marine ecosystem, have to take part in the dialogue. For these efforts to succeed, representatives of the relevant key industries in the GoM-LME will be engaged in the dialogue as/when appropriate in the development and implementation of the different Components of the SAP Implementation Project. The Project will, across the work of the respective components and through implementation of the various activities, strive to foster a continuation and strengthening of these multi-stakeholder dialogues.

Finally, given the likelihood that climate change driven effects could negatively impact the results obtained by the Project, the mainstreaming of climate change adaptation in GoM-LME governance and management interventions will also be considered as a potentially important barrier. This will be addressed to the fullest possible extent during the implementation of the project.

3. Proposed Alternative Scenario - The GoM-LME Project

The UNIDO/GEF Project "Implementation of the Strategic Action Program of the Gulf of Mexico Large Marine Ecosystem" (GEF ID 6952; 2016-2020 – GoM SAP Implementation Project) is a 5-year project specifically aimed at facilitating the implementation of the Mexico/U.S. endorsed Transboundary Diagnostic Analysis (TDA – 2011) and Strategic Action Plan (SAP – 2013) for the integrated management of the GoM-LME.

The Project will achieve this by prioritizing the implementation of coordinated and integrated sustainable ecosystem based management approaches (EBM) to address the transboundary concerns of countries bordering the GoM. Specifically, the actions proposed for the protection and conservation of the GoM-LME have been designed and will be implemented to address the 3 main "challenges" identified by the SAP: controlling and reducing pollution; recovering living marine resources (LMR); and, rehabilitating marine and coastal ecosystems. The SAP Ecosystem Quality Strategic Areas are:

- Improve water quality
- Avoid depletion and recover degraded living marine resources
- Conserve and Restore Coastal and Marine Ecosystems
- Mitigate and Adapt to Climate Change and Sea Level Rise
- Improve Science Education and outreach
- Cross-Cutting Strategic Areas
- Promote compliance with existing institutional, policy and legal arrangements
- Create monitoring and evaluation indicators pursuant to GEF guidelines to measure success and progress to reach goals
- Enhance information and knowledge exchange and promote awareness and participation
- Incorporate sustainability, new technology and innovative economic instruments
- Consider and adapt to predicted climate change impacts.

The SAP's long-term Ecosystem Quality Objective (EcoQO) for the marine environment of the GoM is to improve water quality; enhance economic vitality by avoiding depletion and recover living marine resources; and conserve and restore coastal and marine ecosystems. In particular, the EcoQO to Improve Water Quality aims to establish strategies and actions for the reduction and control of nutrient over-enrichment, harmful algal blooms and for the elimination of dead zones. Its most relevant transboundary issues are: habitat alteration and/or loss; eutrophication and hypoxia; effects from hydrocarbons, pesticides, metals, emergent pollutants; and floating marine debris, especially plastics. Another EcoQO considers the safeguard of the habitats and community structure of the ecosystems from harmful impacts -including those caused by fisheries and pollution- that would diminish the contributions of these systems for enhancing livelihoods and human well being.

The Full Size Project (FSP) detailed below will address a number of the issues and challenges identified by the SAP and in so doing will seek and support targeted actions to operationalize the implementation of the endorsed SAP. This will be achieved through implementation of three "action" Components, the first aimed at improving water quality, the second at recovering depleted stocks of living marine resources and the third, addressing the dual challenge of conservation and restoration of the ecosystem, and one "management" Component, aimed at supporting effective monitoring and evaluation by UNIDO, and the widest possible dissemination of results and lessons learned.

In order to target pollution reduction interventions, the SAP identified four of the largest river basins in Mexico as major hot spots, the Papaloapan (1), Panuco (2) and Grijalva-Usumacinta (3), and the lower part of the Coatzacoalcos (4), in which Latin America´s second largest chlor-alkali plant is located[26].

In the mid-term the FSP aims to measurably contribute towards the attainment of the politically endorsed joint vision of the GoM-LME partners: "A healthy and resilient GoM where coastal communities enjoy high standards of quality of life and the region's socio-economic activities are competitive and sustainable. Likewise, the region's natural resources, biophysical structure and landscape quality provide environmental services that halt threats and reduce vulnerability of the population and infrastructure".

Readers familiar with the SAP Development Project, or those wishing to benefit from a succinct overview are kindly pointed to the Logframe of the project, presented as Annex A of the present document. This details activities, deliverables and assumptions, and is followed by a Gantt chart, for easy visual reference of deliverables and timelines. Similarly, readers wishing to achieve a more in depth understanding of the science behind the proposed interventions are kindly pointed to the annexes (Additional information Annex F- Summary of expert reports, or Annex I Expert reports).

Component 1: Improve water quality

The SAP aims to promote shared policy goals and legal and institutional actions to address priority transboundary problems identified in the TDA, including joint strategic actions to reduce the input of nutrients and pollution into the Gulf. Water Quality, one of the three key-strategic areas identified in the SAP, supports living marine resources, biodiversity and habitat in the GoM-LME. Improving water quality is the strategic Ecosystem Quality Direction Area that seeks to establish strategies and actions for the reduction and control of pollution, including nutrient over-enrichment (eutrophication), harmful algal blooms (HABs), and the

[26] Mercury pollution will specifically be addressed in a complementary UNIDO/GEF project being developed for "Identification and Reduction of Mercury Sources by Promoting Environmentally Sound Management of Mercury and its Wastes Draining to the GoM"

elimination of hypoxic “dead zones”, identified not only as difficult technical and scientific challenges to overcome but as transboundary environmental problems.

Water quality is a major element for the assessment of the status and health of the GoM LME. As highlighted in both the Transboundary Diagnostic Analysis (TDA) and Strategic Action Programme (SAP), pollution directly related to the human population's economic activities is one of the most important threats in the coastal areas of the GoM. Pressures from rising coastal populations include increased solid waste production (including plastics), higher volumes of urban and agricultural point and non-point runoff, and the generation of industrial residues. As a result, contaminants generated by cities, agriculture and industry are carried and introduced to the marine environment by rivers, ground water, erosion, and wind, causing detrimental effects on organisms and the ecosystem health of the Gulf.

Eutrophication of major rivers in Mexico and the United States perpetuates hypoxic zones at the mouth of the Mississippi River and the Grijalva-Usumacinta watershed. This eutrophication is caused by a combination of factors, including industrial pollution, as well as nutrient runoff (nitrogen and phosphorus) from fertilizers and other sources (animal manure, etc.). It is crucial to implement aggressive pollution reduction strategies to improve the water quality of the GoM and to reverse the observed trends in pollution loads.

Activities under this Component will focus on addressing pollution resulting from industrial wastewaster emissions. Among other environmental impacts, these activities and will result in measurably improved water quality by reducing HABs and mitigating hypoxic zones to support the recovery of the ecosystem. See the Environmental Impacts table below for further details on impacts identified as part of this Component’s outputs.

In support of these efforts, activities under Component 1 will also contribute to the environmental objectives and selection criteria of Mexican Technical Standard NMX-AA-159-SCFI-2012, which establishes the procedure for environmental flow determination in hydrological basins, in particular to define ecological relevance and intensity of demand. This standard aims to regulate water exploitation, use and conservation in order to safeguard ecosystems and foster sustainable development in watersheds.

The importance of fostering Green Industry is underpinned by the Sustainable Development Goal number 9 (SDG 9), which was recently endorsed for Industry, Innovation and Infrastructure under the global 2030 Development Agenda. SDG 9 is central to UNIDO’s mandate of Inclusive and Sustainable Industrial Development (ISID)[27], where the core pillars are to safeguard the environment, to create shared prosperity and to advance economic competitiveness. In order to assist industries and enterprises to decouple economic growth and revenues from excessive and increasing resource use and pollution, and to thereby aide them to shift towards adopting a green industry approach, UNIDO designed a specific methodology, namely the Transfer of Environmentally Sound Technology (TEST), which is an integrated approach and a global program.

Of particular relevance to these efforts addressing the reduction of industrial water pollution are UNIDOs 2008 to 2012 activities, which supported the implementation of a pollution load reduction project in the states of Tabasco, Chiapas and Veracruz, as part of a Millennium Development Goals Fund multi-agency program. Under this project, UNIDO built the institutional and technical capacities of the National Cleaner Production Center[28]–Tabasco Unit (NCPC-TU) for the application of UNIDO’s TEST methodology. In the last few years, in keeping with its mandate, UNIDO coined the Green Industry concept to place inclusive and sustainable industrial development in the context of new global sustainable development challenges. Green industries

[27] See http://www.unido.org/who-we-are/unido-and-the-sdgs.html and http://www.unido.org/resources/publications/flagship-publications.html

[28] http://www.unido.org/NCPC-TU.html and http://www.unido.org/fileadmin/user_media_upgrade/What_we_do/Topics/Resource-efficient__low-carbon_production/NCPC-TU_20_years.pdf

are creative and innovative, constantly developing new ways of improving their economic, environmental and social performance.

Environmental Impacts – Component 1: Improve Water Quality	Output
The outputs and activities under Component 1 identify a broad range of environmental impacts anticipated as a result of project efforts. These impacts will directly contribute to achieving the overall objective of improving water quality in the GoM and especially in the four major pollution hotspots identified in Mexico.	
• Strengthened capacity for water quality monitoring mechanisms and implementing ecosystem modeling tools will result in improved water quality management as well as the ability to monitor resulting water pollution reductions necessary to support improved environmental quality.	**1.1.1**
• It is expected that the proposed project will result in average reductions for BOD_5, N and P of 15%, with a a minimum reduction of water use by 10% by the industries involved in the project.	
• Implementation of revised regional standards for toxicity of wastewater discharges to be supported by the project will result in improvement of water quality in receiving bodies.	**1.1.2**
• Reduction of wastewater discharges and pollution loads will be facilitated through identifying micro watershed level priority intervention areas and the industries within them that are most likely to commit to applying the UNIDO TEST methodology.	**1.2.1**
• Policy recommendations to increase environmental compliance through private sector pollution reduction initiatives will result in reduction of pollution from industrial wastewater.	**1.2.2**
• Training workshops using UNIDO's TEST methodology combined with support for seeking financing will support local industries in adapting cleaner, more-efficient production processes to reduce pollution.	**1.2.3**
• Implementation of the five UNIDO TEST tools will result in industrial wastewater quality being measurably improved and pollution load trends being reversed, which will contribute measurably to the reduction of hypoxic zones. Reductions should be similar to those in other TEST implementation projects, including in the Mediterranean.	**1.3.2**
• Dissemination of TEST implementation results will showcase economic and environmental gains, the reduction of industrial wastewater discharges and resulting improvement in water quality.	**1.3.3**
• The development and establishment of a coastal conditions monitoring programme will provide a key source of information on environmental changes.	**1.4.1**
• An Early Warning System to detect harmful algal blooms will help reduce environmental impacts from these events and enable better identification of triggers, including monitoring the contribution of industrial pollutants.	**1.4.2**

This Component is divided into four interlinked Outputs that collectively seek to meet the objective to improve water quality in the GoM, initially focusing on Papaloapan, Panuco, Grijalva-Usumacinta and the lower part of the Coatzacoalcos.

Output 1.1: Assess water pollution indicators and reinforce water quality monitoring mechanisms

CONAGUA has an extensive network of monitoring stations collecting data on SAP key indicators: BOD_5, COD, TSS, nutrients and heavy metals such as mercury[29]. This data allows CONAGUA to assess the relative contribution to the pollutant loads from various sources (human activity, municipal and non-municipal discharges, etc.).

As Executing Agency for this Output the Mexican Institute of Water Technology (Instituto Mexicano de Tecnología del Agua—IMTA) of SEMARNAT will be responsible and will support a process to strengthen existing water quality-monitoring mechanisms. IMTA is a decentralized body of SEMARNAT whose mission is to contribute to the sustainable management of water through knowledge, technology, human resources training, and innovation, for the protection of water resources and their efficient and fair allocation among different users. In particular IMTA will lead the review of the parameters monitored in wastewater discharges located in the priority intervention areas and will prepare a Gap Assessment report. Based on this, IMTA will convene a panel for discussions aimed at determining if/which additional parameters should be monitored in the country (by CONAGUA) to provide a more complete determination of water quality, in line with the revised version[30] of the Official Mexican Standard for wastewater discharges (NOM-001) at regional level (including the priority hot spots). As the updated Standards will cover additional parameters of toxicity and colour, a complementary series of quality and loading indicators will be verified, and actions to measure these will be supported.

This Output's Activities will also be complemented by a series of proposed training sessions organized jointly by Mexico and the United States (SEMARNAT, CONAGUA, IMTA, SEMAR, U.S. EPA, and the U.S. Geological Survey (USGS)), with support from the U.S. Army Northern Command (NORTHCOM). These training sessions will cover stream flow, water quality, aquatic ecosystem monitoring, database management, data sharing, data analysis (see: http://waterwatch.usgs.gov/), and ecosystem modeling tools to manage water quality and monitor the resulting reductions, in support of improved environmental quality. SEMARNAT, as part of its in-kind contributions will facilitate and support participation of representatives from relevant Mexican Agencies, States, NGOs and academic institutions who will be invited to these training sessions. The Project will benefit from these capacity building activities which are expected to review amongst others, methods and transfer of scientific techniques used in the assessment of environmental data between Mexico and the United States.

1.1.1 – Water quality monitoring stations and wastewater treatment plants identified and assessed in priority hot spots

IMTA will support the strengthening of the capacities for water quality monitoring mechanisms, mainly in wastewater discharges, in order to ensure that upon entry into force of the updated Mexican Standards (expected end of 2016) the additional monitoring requirements dictated therein can be met, and the results mainstreamed. CONAGUA has well established monitoring capacities, and extensive data series are available, from CONAGUA's National Monitoring Network (Red Nacional de Monitoreo—RNM, which systematically measures water quality across Mexico. Nine private certified laboratories, carrying out the analysis of physicochemical and microbiological parameters, support the RNM. This Network, in operation since 2012, comprises 5,000 stations located in the main water bodies of the country—including areas subjected to high anthropogenic influence—monitoring surface water, groundwater bodies and coastal areas.

[29] In 2013 CONAGUA also carried out monitoring using the benthic diversity index: 6 benthic diversity samplings were carried out in the Northern Gulf Region and 4 in the Central Gulf Region

[30] It is expected that NOM-001, which is currently under review, will be approved mid-2016 and enter into force end-2016

Detailed information on the monitoring stations is available through the web-based National Water Information System and includes: location and name of the station, hydrologic administrative region, type of water body, type of network and mean yearly parameter values. This system also includes information on municipal water treatment plants (municipality, location, flow, treatment type and receiving water bodies), and is published by CONAGUA yearly, in the National Inventory of Operational Water Purification and Wastewater Treatment Plants.

Using, amongst others the above mentioned extensive data series from CONAGUA and its National Monitoring Network, IMTA will prepare a Comprehensive Spatial Analysis Report (location and distribution, pollution loads, per watershed area) of the existing water quality monitoring stations and water treatment plants in the priority hot spots (Papaloapan, Coatzacoalcos, Panuco, and Grijalva-Usumacinta rivers). This Comprehensive Analysis will provide the factual basis for the preparation by IMTA of a Technical Assessment Report, verifying, evaluating and ranking the most relevant monitoring stations that will be presented to the PMU who will validate the different intervention sites for the IMTA. The Technical Assessment Report will also review, evaluate and rank the most relevant monitoring stations for coverage of water quality related information. It is expected that a minimum of 8 monitoring sites and 8 water treatment plants will be selected (2 per priority hot spot) for follow-up activities. This Report will also feed in to the process of selection of industries that will receive training and be guided in the implementation of the UNIDO TEST methodology, which is explained further under Output 1.3

1.1.2 - Building capacities for implementing and strengthening mechanisms for water quality control and monitoring

This activity will facilitate the implementation of the revised version of the Official Mexican Standards (PROY-NOM-001-SEMARNAT-2015) for wastewater discharges at the regional level (Including Gulf of Mexico States), which is scheduled to enter into force at the end of 2016. The new iteration of the standards considers parameters of toxicity and colour and,as it is expected that their implementation will improve the water quality of receiving bodies in the medium term, a series of parameters as identified by CONAGUA, and actions to measure these will be supported.

IMTA will convene and host a group of technical experts (including but not limited to representatives from the Federal Commission for the Protection of Sanitary Risks (Comisión Federal para la Protección contra el Riesgo Sanitario - COFEPRIS), CONAGUA, IMTA, SEMARNAT) for a one day meeting, and further to this, IMTA, in coordination with CONAGUA, will prepare a report verifying and analysing gaps in currently monitored water quality parameters in wastewater discharges, which will need to be addressed to comply with the updated Official Standards. Based on this Gap Analysis Report, and taking into account the identified monitoring stations and water treatment plants to be strengthened (prepared under 1.1.1), IMTA will then prepare a draft Assessment Report prioritizing additional parameters to be measured, and at the selected water treatment plants located on the project sites. These additional parameters will include, but need not be limited to biological indicators, organic pollutants, salinity intrusion, etc. With the support of the PMU, results will be aligned, as much as possible, with the objectives of Output 1.4 (Implementation of an Environmental Monitoring Programme) as well as with Activities implemented under Component 3, Output 3.1 (Community education focussing on domestic wastewater). This assessment report will also consider the effect of the updated regulations on water quality in rivers and points of discharge, taking into consideration Water Quality Criteria, Regional Conditions of Reference and Rivers Classification Studies.

IMTA will reconvene and host the group of technical experts for a second one day meeting to review and validate, as appropriate, the draft Assessment Report prioritizing additional parameters to be measured in wastewater discharges. The group will then verify and review options, and assess mechanisms to support the measurement of these additional water quality indicators in the identified monitoring stations on the project sites. The group will also review the requirements and challenges of implementing these throughout the Gulf States. Based on these discussions, IMTA will prepare a final Report summarizing the discussions

of the group of technical experts and presenting the recommendations for additional parameters to be measured and, options, mechanisms and challenges to ensure their sustainable implementation and replication throughout the Gulf States. This will be delivered to the PMU who will validate jointly with SEMARNAT.

Upon validation of the recommendations, and in support of the enforcement of the updated Standards, IMTA will be responsible for ensuring the periodic monitoring of wastewater discharges at the selected wastewater treatment plants, over the life of the Project, to assess if there are identifiable changes that were not measured previously. IMTA will report these results to the PMU bi-yearly starting from Q2 year 2 of the Project.

The Project, through the PMU, will also strengthen water quality monitoring capacities of CONAGUA through specialized training (provided by the equipment manufacturers) and provision of a mobile laboratory unit and a buoy for analysis of a series of parameters including minerals, nutrients, metals and metalloids, cyanophytes, dinoflagellates, hydrocarbons and organic pollutants in coastal waters. The mobile laboratory and buoy [31] will be compatible with other units operating in the country (Hach Biotector, and/or Ott Hydromet/Hydrolab, etc. currently installed, operated and maintained by the Laboratorios ABC Química e Investigación AC de CV, on behalf of CONAGUA). CONAGUA, in collaboration with the Laboratorios ABC and the PMU, will be responsible for the preparation of the technical specifications for the purchase of the required equipment. Data obtained by this equipment, in particular during emergencies such as HABs or oil spills, will provide valuable and indispensable inputs for the early-warning system of the Environmental Monitoring Programme (Output 1.4) which would not be rapidly available otherwise. The benefits and relevance of an early warning system are directly proportional to the quality of the data, to how recent it is, and to how rapidly this is integrated. Without this additional equipment, the early stages of development of this early warning system, and the painstakingly built support for its nationwide deployment would be at risk.

The buoy, which will be deployed initially in the lower Coatzacoalcos, will be maintained by CONAGUA starting from end of year 3 of the Project (maintenance costs are covered by manufacturer for first 3 years), and the real time data provided, will be used on a pilot basis to assess the pertinence of generalizing the purchase and subsequent deployment of these tools, on a permanent basis, to other sites subject to industrial pollution. Under the SAP Development Project a similar piece of equipment was deployed by CONABIO and to this date continues to operate in support of current monitoring efforts. Scaling up this system will contribute to the deployment of the early warning system in support of decision-making and will facilitate the development of consistent regional cooperation and the eventual installation of an observing system for the whole region (Independent Final Evaluation, UNIDO 2014). In parallel, the mechanisms and modalities to facilitate cooperation on data management, analysis (using statistical tools, GIS and modelling, etc.) and comparability between Mexico and the United States, will be promoted in partnership with the training activities planned by the USGS (see Output 1, Introduction).

Output 1.2: Strengthen the dialogue between government and industry

The Mexican Government has strategies for industrial pollution reduction in place, but these can only succeed in practice in a transboundary environment as that of this project if dialogue between the private and public sectors, and key stakeholders is facilitated and participation from all is assured. In this sense UNIDO has a unique comparative advantage in that it can involve the industrial and private sectors and showcase the results of similar activities that have been widely and successfully demonstrated. To this effect, this Output will support the establishment and consolidation of a public-private-community collaborative forum.

[31] Equipment will be procured by UNIDO and will be delivered directly to CONAGUA, through the PMU. CONAGUA will ensure equipment is inventoried and maintained in proper operating condition and will provide the PMU with bi-yearly status reports, for the duration of the Project

The National Cleaner Production Center - Tabasco Unit (NCPC-TU) will be the national executing partner for this output. The NCPC-TU provides training of human resources, scientific research, technological development, advice and technical assistance, influencing the domestic industry to maximize their productivity and competitiveness, through the application of resource efficient cleaner production processes and the application of environmentally sound technologies. It aims to decouple economic growth from resource consumption.The NCPC will be responsible forbringing together key stakeholders, including state and municipal authorities, river basin councils, water utility providers, scientific and research institutes, local community representatives, civil society, industry associations, and private sector representatives into Working Groups (one per priority hot spot). These Working Groups at the four project sites will be established by the NCPC-TU, in a participatory process (as explained below), and these will provide a forum to discuss pollution reduction, propose solutions and reach agreements and foster dialogue and partnership. The efforts and progress of the activities under Output 1.1, 1.3 and 1.4 also flow into these dialogues in support of this crosscutting Output.

Climate change is now requiring fundamental changes of global economies, and driving their transformation from high-carbon to low-carbon ones. It is critical that industry, as a key driver of growth in these four project sites, continues to thrive, albeit in a sustainable way. The public and private sectors, and indeed all citizens have a key collective role to play in applying green practices and changing consumption and production patterns, on a daily basis to reduce the pressures on the ecosystem. The international community has a fundamental role to play in supporting this in every way possible by providing for example access to technical and managerial know-how on best practice models, as well as access to finance, to guide sustainable pollution reduction development that is in harmony with the surrounding natural environment, biodiversity and ecosystems. Given that the pollution challenges addressed by this project are transboundary in nature and hence no longer merely localized but globalized, shifting the responsibility to a collective multi-stakeholder partnership is fundamental, and this output lays the foundation for such a dialogue to take place and for effective and sustainable partnerships to be fostered.

One of the main challenges faced by industry and enterprises in the private sector, concerning pollution reduction, is that they often do not have the requisite technical expertise in and for sustainable environmental management, nor do they easily have access to acquiring this know-how, or to learn from best practices. Therefore, the establishment of the forums for dialogue in the Projects context will be accompanied by a series of workshops in each of the project areas. These will present the successful UNIDO TEST methodology and integrated approach to thereby showcase best practices, and create awareness on the consistent economic and environmental benefits that can result from the optimization of industrial processes and pollution reduction from the application of a set of 5 key tools. The NCPC-TU will verify and engage key stakeholders in the private and public sectors, and from within the communities, to be part of these workshops. Given their ample and demonstrated expertise with the private sector and in the application of the UNIDO TEST methodology, the National Cleaner Production Centre – Tabasco Unit (NCPC-TU), as the Executing Agency (EA) for Output 1.2 and 1.3, will be responsible to develop and implement the activities under both Outputs.

This Output will thus consist of the selection of industries/enterprises, state and municipal authorities, river basin councils, water utility providers, scientific and research institutes to participate in the designated 4 Working Groups, as well as in the coordination, facilitation and implementation of TEST methodology sensitization dissemination workshops. It is noteworthy that very significant pollution reduction results as well as enhanced industry competitiveness have previously been demonstrated when both the private and public sectors were involved. The training activities carried out under this Output will facilitate the further roll out of TEST and engagement of industry representatives, and as such will set the stage for the subsequent selection of industries and capacity building activities.

Based on the topics selected and the results of the discussions by the Working Groups, the NCPC-TU will prepare draft environmental policy recommendations in support of pollution reduction initiatives from the private sector, for increased environmental compliance, which will be presented for the consideration of

SEMARNAT. As a result of these recommendations, it is expected that long- term policy changes will be implemented to support environmental protection through reduction of pollutant loads.

1.2.1 – Identification of industries in priority hot spots

The NCPC-TU, in collaboration with SEMARNAT, and with support from CONAGUA and building on the results from Output 1.1, will be responsible for the identification, ranking and pre-selection of industries in the four priority intervention areas (hot spots) that could be most likely to commit to being trained and to apply the UNIDO TEST methodology. The selection will be on a case-by-case basis in line with the micro watershed approach (i.e., taking into account a micro-basins geographical extension and not municipal or state limits). This approach has been demonstrated by UNIDO to facilitate the identification of all industries in a reduced intervention area, presenting comparable environmental conditions.

Data, including presence of monitoring stations (considering results from Activities 1.1.1 and 1.1.2), types and location of industries, wastewater discharge volumes and pollution loads as well as water allocation permits will be taken into account to verify and rank those industries most likely to obtain significant results from linkages with the public sector and the TEST methodology trainings under activity 1.2.3.

This activity will also contribute to supporting the identification and selection of key stakeholders who will be invited to participate in activity 1.2.2.

1.2.2 – Validation of industrial pollution reduction priorities

The NCPC-TU will select representative industries identified under 1.2.1 above, from each of the 4 priority hot spots and will assist these to nominate relevant participants from their management and technical staff, who will be invited and supported by the NCPC-TU to a 3-day workshop to facilitate the identification of the main pollution reduction challenges faced, from their respective perspectives so as to ensure a bottom-up participatory validation of pollution reduction priority measures. Participation will also be sought from state and municipal authorities, river basin councils, and water utility providers to ensure diverse and representative stakeholder participation. In total 4, 3-day workshops for a minimum each of 50 participants will take place (one in each of the hot spots) and the NCPC-TU will recruit a team of at least 3 experts (environmental science, public policy and municipal economic development) to moderate and facilitate the Workshops lead participatory discussion sessions to verify priority pollution reduction topics and document results (minutes, workshop report).

The first objective of the moderators will be to assist participants in these workshops to verify priority pollution topics to be further discussed in thematic discussion groups. Once the priority themes are identified, working groups will be established and these moderated thematic sessions will provide an opportunity for participants to verify, discuss and prioritize the joint-strategies most likely to succeed in resolving identified issues. These strategies will be agreed in a participatory and consensual manner by all sectors involved, and the moderators will keep a record of all the issues discussed and agreements reached. This will facilitate the preparation of draft policy recommendations by these recruited experts, and based on these, the NCPC-TU will prepare draft environmental policy recommendations for tackling pollution reduction that will be presented once reviewed by the PMU, for the consideration of SEMARNAT. The result of these activities will also directly link to Activity 1.3.1 and Output 1.4 (Site identification and selection of enterprises; and, Implementation of an Environmental Monitoring Programme, respectively).

1.2.3 – Introduction of the TEST Methodology

The Transfer of Environmentally Sound Technology (TEST) Programme to harness the full potential of industry's contribution to Inclusive and Sustainable Industrial Development is a comprehensive and integrated approach developed by UNIDO to address the challenges and barriers industries face to become more resource and energy efficient; non-polluting and safe; to produce products that are responsibly

managed throughout their life cycle, while increasing productivity; to gain access to international markets with good quality products; and to comply with environmental standards.

Industries are not generally aware of the advantages to be gained through the optimization of processes and more efficient technologies. The implementation of the TEST methodology has demonstrated that industries can become more profitable, while becoming more resource efficient and reducing their environmental impacts, hence the work under this Activity will generate precisely this kind of sensitization. TEST therefore comprises provision of technical assistance to verify inefficiencies in production processes; determination of the costs of these inefficiencies; identification of options to improve the efficiency of the industry and, calculation of the internal rate of return, establishing linkages to sources of venture capital, as/if necessary. Given the competitiveness aspect of the TEST methodology, the achieved economies deliver a double benefit; the first in terms of the environment, by encouraging the use of cleaner more efficient technologies; the second financial, by improving efficiency and reducing costs. Both of these contribute to the sustainability of businesses, which in turn contributes to the local economy.

During the first year of the project the NCPC-TU will organize and deliver eight, one-day sensitization workshops in the four selected priority areas, supporting a minimum of 40 participants to each of these. The NCPC-TU will introduce the TEST methodology at these workshops using an array of communication materials that will be developed to illustrate the impact and best practices delivered by the deployment of this integrated approach. These will include a PowerPoint presentation, flyers and factsheets (to be validated and centralized by the PMU) showcasing the benefits of applying the TEST methodology and integrated approach, inclusive of demonstrating results obtained to date across different industrial sectors in different countries with the same pollution issues. Under the guidance of the PMU, this sharing of best practices will also seek to build as/when possible on activities being implemented under Outputs 1.1 and 1.2, as well as on best practices and success stories in pollution reduction having taken place, or being implemented by project partners in the United States.

The organization of the workshops will be carried out by the NCPC-TU in coordination with State authorities from the Ministries of Environment and Economy, Municipal authorities, and local Chambers of commerce and industry, and associations to ensure public sector support and maximize the target audience. The TEST methodology sensitization dissemination workshops will facilitate and support the involvement of industry representatives, including those participating in the Working Groups put in place under Output 1.2, building on the fact that previous results from the implementation of the TEST methodology have demonstrated positive results in pollution reduction, and have also enhanced enterprise competitiveness of the private and public sectors involved.

To support the success of the TEST methodology, the following principles will be shared during the sensitization workshops in each of the project areas. TEST:

- Requires a voluntary commitment from the pilot industries to proactive environmental management;
- Is problem-driven, focusing on the needs of enterprises and the surrounding pollution issues;
- Is flexible and open to innovative solutions – the specific tools used in the TEST projects (enterprise-level) are selected and introduced based on the results of the initial review of the needs of the enterprise and the surrounding pollution issues;
- Uses across the application of its five tools integrated pollution prevention and control (IPPC) and best available practices and techniques (BAPs/BATs) approaches;
- Optimizes production processes by focusing first on material efficiency strategies, followed by incorporating what are now less onerous, end-of-pipe solutions (if required);
- Ensures that environmental costs are properly allocated to their source, identified measures are implemented and TEST project results are monitored;
- Analyses problems in all their economic, social and environmental complexity.

- The benefits for industries, which embark on this project and agree to be trained in the application of the TEST approach, are manifold and will be explained in detail during the sensitization workshops to illustrate:
- Increased productivity, reduced operational costs, optimized investments;
- Minimized environmental compliance costs, reduced environmental risks and environmental footprint;
- Compliance with international environmental standards to access new markets (global supply chains and export markets, new green markets and public procurement, etc.);
- Secured long term supply of production inputs: the adoption of a resource efficiency strategy that can mitigate the effects of disruptions and price volatility in the raw material supply chain;
- Improved relationship with public sector and stakeholders (investors, banks, regulatory body, local communities, consumer associations, etc.)

Output 1.3: Implementation of the TEST methodology

Under this Output, the NCPC-TU will be responsible for the deployment of the UNIDO TEST methodology in the selected and committed enterprises in the 4 intervention watersheds of the Papaloapan, Coatzacoalcos, Panuco, and Grijalva-Usumacinta rivers, including Laguna de Terminos. These watersheds were selected due to their size and importance in terms of discharges into the GoM and were also identified to be pollution hot spots with high loads of industrial pollution, organic pollution, agrochemicals, suspended solids and heavy metals.

The NCPC-TU will select sites for the implementation of the TEST methodology during the first year of the project, and upon completion of this process candidate industries located on these sites will be identified and ranked, based on as large a suite of parameters, including for example reported releases of pollutants to water bodies, water allocation volumes for consumptive use, enterprise belonging to a recognized heavily polluting sector, etc. The motivation and commitment of the industries management is also a critical element, to ensure sustainability in the application of the TEST approach. They are instrumental in putting together their internal team of staff who will be assigned to work with the NCPC-TU to implement TEST.

SEMARNATs PRTR (Pollutant Release and Transfer Registry - Registro de Emisiones y Transferencias de Contaminantes—RETC - http://www.semarnat.gob.mx/gestion-ambiental) will be of particular relevance in this process as it includes information on pollutant releases to the environment (air, water, soil and subsoil) transferred in wastewater and/or in hazardous waste[32]. The PRTR is updated on a yearly basis and is used, among others, to facilitate identification of point source (industrial) releases and, assessment of industrial performance. Data from the PRTR will also be used by the NCPC-TU in support of the identification of potential opportunities for reduction of releases and transfers; It is expected that the selected enterprises will include, amongst others, chemical, oil and petrochemical, metallurgical and textile plants, as well as the agro-food industry (in particular sugar production).

Following the model of previous TEST implementation projects in Mexico, the National Cleaner Production Centre – Tabasco Unit (NCPC-TU), will also assume responsibility as the Executing Agency (EA) for this Output. Work will be undertaken in close collaboration with the Ministries of Economy and Environment of the States involved and this cooperation will be supported by regular contacts with the Ministries' designated Focal Points for the GoM-LME Project, who will provide institutional support to the NCPC-TU.

[32] In Mexico all industrial sectors regulated under federal law are required to report to the RETC, including facilities that discharge into national water bodies

The work under this activity will increase the treatment ratio for industrial wastewater from 40% as it stands in 2014. Given that industrial discharges account for 68% of the volume of wastewater discharged into rivers and streams, and 76% of BOD_5 load, the project will improve water quality in 4 of the most relevant Mexican contributory river systems to the Gulf of Mexico and thus reduce hypoxic zones in the coastal zones adjacent to these rivers estuaries. It is expected that the rollout of the TEST methodology will result in conservative (low-end) average reductions for BOD_5, N and P of 15%, and in a minimum reduction of water use by 10% by the industries involved.

1.3.1 – Identification of intervention sites and selection of 50 industries

The NCPC-TU will be responsible for the identification of the areas with the highest concentrations of industries likely to benefit from the TEST methodology and for their selection. The selection process will use the Comprehensive Spatial Analysis prepared under 1.1.1 for the priority hot spots and will also take into consideration the lists prepared under 1.2.1 above, as well as data from the National Water Information System (http://201.116.60.25/sina/). This analysis will confirm candidate industries in areas that are both well monitored for water quality and that include important industrial activity.

The results from the analysis will then be cross-referenced with other sources of information[33] to verify and rank candidate industries for TEST methodology implementation, with the objective of inviting 50 of these to participate in the project. The industries will be ranked based on water consumption and wastewater and pollutant discharges. The final selection of industries that wish to be voluntarily part of the Project, and that fulfill the necessary requirements, will be validated by the PMU, working in close collaboration with the office of the Federal Attorney for Environmental Protection (PROFEPA), the SEMARNAT and the States Ministries' of Economy. As afore mentioned, the voluntary motivation and commitment of top management of each industry is crucial to sustainability of the TEST application.

The selected industries will prepare, with the support of the NCPC-TU, commitment letters which will be signed with the understanding that their participation is voluntary, non-remunerated and that they will proactively cooperate to ensure and permit that results can be showcased during and at the end of the project (i.e. in the progress and final report, and with factsheets that will be prepared). The industries will, in these letters, commit to co-financing primarily in-kind for human resources who will be trained in, and implement the TEST tools. If applicable these will also make investments into necessary EST recommendations, if/where these make economic and environmental sense. An agreement will be reached that no confidential information pertaining to any of these industries will be shared (particularly nothing related to environmental accounting) by the NCPC-TU or this Project unless authorized

1.3.2 - Implementation of the TEST methodology tools

The Transfer of Environmentally Sound Technology methodology (TEST) was developed by UNIDO in 2000 and is aimed at improving the environmental management and competitiveness of industries in developing countries and transition economies. It is a "Best Available Practice" (BAP) that has been implemented in many countries with positive economic and environmental results as an Environmental Management Systems process. It also has the added benefit of being applicable to micro, small and medium enterprises, as well as to large companies in both the industry and service sectors, as it is tailored and customized to each respective client.

[33] Including river declarations of classification from CONAGUA, river flow classification studies from IMTA, data from enterprises listed on the Pollutant Release and Transfer Registry (PRTR, or RETC, in Spanish: Registro de Emisiones y Transferencias de Contaminantes), water allocation volumes for consumptive use (Estadísticas del Agua en México 2014 – Water use statistics 2014), as well as discharge and concession permits

The TEST methodology consists of five tools aimed at improving management practices in a holistic manner, to ensure the sustainable introduction of green practices. The management tools require the involvement of the complete management pyramid and, therefore in the process, the whole chain of command in an enterprise is trained and capacitated in the use of the various tools. This approach ensures true ownership of the changes introduced and sustainability of their adoption. Moreover, the TEST methodology relies on the application of the double learning cycle, involving continuous movement from “plan” to “do” to “check” and to “act”. The concept ensures the accurate recording of the changes introduced and the measurement of their effects. Applying the double learning cycle continuously leads to the constant improvement of the business.

The five TEST management tools applied in combination in an integrated framework are:

1) Resource Efficient Cleaner Production Assessment (RECPA),
2) Environmental Management Accounting (EMA),
3) Environmental Management Systems (EMS),
4) Environmental Sustainable Technology (EST), and,
5) Corporate Social Responsibility (CSR).

Prior to applying the 5 TEST tools there is a tool referred to as the Hotspot assessment covered by Outputs 1.1 and 1.2, which set the baseline for verifying the pollution hotspot areas and the industries that will participate in this TEST work, as well as the key pollution issues that will be tackled. As mentioned above, this participatory approach, supported by the analysis of scientific and technical data, is considered fundamental to the identification of the participating industries, and to the success of the interventions.

The TEST methodology and integrated approach is built on four pillars:

1) Revealing the "total costs" of resource use inefficiencies within production through the quantification of non-product output (NPO) costs;
2) Assessing the industry resource efficiency and environmental performance against sector benchmarks and international best practices;
3) Understanding the root causes of inefficiency and focusing on key consumers addressing the core process needs first when generating options for improvement;
4) Installing an effective information system on priority material and energy flows, which helps to identify new opportunities for improvement, to monitor results and, last but not least, make people accountable for resource efficiency at the point where they influence it.

Key outputs resulting from the customized integration and implementation of these tools and their elements include the adoption of best practices, new skills and a new management culture, enabling the enterprises to move forward on the path of improvement towards sustainable production. The selected team at each participating industry from management and financial level, to skilled worker level will be trained in the application of TEST.

The NCPC-TU will conceptualize, lead and deliver the requisite trainings, assessments and technical assistance for the implementation of the TEST methodology to the selected industries. They will be responsible for preparation of tailor-made training materials and manuals (to be validated by the PMU, and that will include the five TEST tools, case studies with best practices, check lists and presentations with exercises). The work of the NCPC-TU under this Output will commence with organization and delivery of four inception workshops (one in each of the four project sites) targeted at the selected industries where training on the 5 TEST tools will be provided.

After the inception workshops the NCPC-TU will visit participating industries individually and commence the TEST work with an initial meeting with top management and the key staff that will be involved in the application and implementation of the TEST work within the respective industry. This will be combined with

an initial assessment (initial review process) of the 5 TEST tools to ascertain the baseline of the TEST work that will be carried out within each industry, as well as to allow the NCPC-TU to prepare tailor made no cost, low cost and cost recommendations and solutions to be put forward to the industry for their application and implementation. The NCPC-TU will set up baseline indicators in order to allow for the impact of the project work in the demonstration industries to be assessed. These baseline indicators and recommendations will be presented in a report to each of the individual participating industries on a case by case basis and the NCPC-TU will assist them to decide which recommendations will be pursued, which it will park for further consideration, and which are not feasible at that point in time.

First-hand results will be obtained for each participating industry during the initial review process by measuring water and energy use, as well as pollutant emissions at the beginning of implementation and then again periodically during and after the TEST tools have been applied. An inception report will be provided to the PMU documenting this work for each participating industry inclusive of the baseline indicators and trainings, and once cleared by the PMU this will be shared with each participating industry. The IW TT will be updated to reflect the TEST deliverables based on the information presented in the inception report.

A workplan with clear timelines will be devised and agreed to with each industry. The NCPC-TU will from that point onwards advise and guide the respective industries in the implementation and application of these recommended changes so as to put them into practice. This will commence at the end of year 1 and by year 2 will be ongoing in all of them. The objective is for these changes and their progress and impacts to then be monitored on a periodic basis (and documented in progress reports by the NCPC-TU to the PMU on a 6 monthly and annual report basis, as well as information shared into the Working Groups under the work of Output 1.2) between year 2 and year 4. The first half of year 5 will be used by the NCPC-TU to undertake the analysis and documentation of the results so that these reports are ready 6 months prior to project closure, and ready to be used as inputs into the final dissemination materials.

The implementation of the 5 TEST tools in an integrated manner will make it possible to quantify economic savings and environmental benefits achieved through the implemented changes. It is expected that further to the introduction and review of the results from the implementation of the 5 tools in the participating industries, that industrial wastewater quality will be measurably improved, and pollution load trends will be reversed, contributing measurably to the reduction of hypoxic zones.

Data shows that treatment of this wastewater stream is significantly lower (40% in 2014) than for domestic discharges, and this is further evidenced by water quality monitoring data from 2011-2013, showing an increase in COD, attributed to untreated industrial discharges. It is important to highlight that wastewater from economic activities generated by small and medium enterprises, such as small industries or service businesses, located in urban centers, falls into the “domestic discharge” category (according to the Cartagena Convention). This wastewater is discharged into the urban or rural sewerage system and is treated in municipal wastewater treatment plants. It therefore follows that an additional benefit from the delivery of Technical Assistance (TA) activities provided during the implementation of the TEST methodology will effectively also result in a reduction of the pollution load from domestic wastewater.

In order to further enhance these additional benefits, this Output, through the involvement of the PMU, will also seek to establish strong links with Component 3, which focuses on community sensitization, awareness raising and community engagement in solid and liquid waste management issues. The resulting reduction in water use, water pollution, chemicals consumption, energy consumption and atmospheric emissions for the participating industries, will facilitate compliance with the revised NOM-001 for wastewater discharges, as key pollutants targeted for reduction are BOD_5, COD, TSS, inorganic nitrogen, phosphorous, and heavy metals. This will be verified by the reports and factsheets prepared under Output 1.3.3, below.

While it is not possible to project exact pollutant reductions at this point in project development, based on experiences gained from the application of the UNIDO TEST methodology in comparable projects we can assume similar results. For example, with a total project budget of US$2 million provided by GEF and the Government of Italy for the provision of technical assistance for the application of the TEST methodology to

43 industries in the Mediterranean, this project resulted in BOD_5 load reductions of 3,238 t/yr, COD load reductions of 4,535 t/yr, and 9.7 m^3 water savings per year.

1.3.3 – Dissemination and promotion of results

Under the TEST implementation work of output 1.3.2, the NCPC-TU will be working with each participating industry to document the progress of the application of the 5 integrated tools. This will be reported to the PMU on a 6 monthly basis in appropriate formats that the PMU will provide at the project inception stage (inception report, 6 monthly and annual report and final reporting templates) as part of the NCPC-TU subcontract. The progress of this work will also be regularly shared within the forums established under output 1.2, and the continuous showcasing of the positive impact and progress of the TEST work is expected to create more demand by other industries to also partake in this work with the NCPC-TU in the future. Hence, another key reason for having the TEST work being led by the NCPC-TU is to ensure that the know-how and expertise remains embedded nationally. This also offers the NCPC-TU the opportunity to increase its scope of services and client base after project closure.

The NCPC-TU will also be responsible for preparing an overall final report for the PMU prior to project closure that will clearly capture and showcase the execution of the TEST work, focusing on the uptake of the RECP recommendations (no cost, low cost and cost recommendations) and their environmental and economic impacts. (Documented pollution reduction and investment and payback periods and revenue generated from economic investments/savings in applying green approaches and technological solutions with a focus on wastewater discharges). An individual final report for each industry with the analysis of their execution results will also be prepared by the NCPC-TU.

For the purpose of the dissemination and promotion of the results and impact of the TEST work, the NCPC-TU will prepare and make available in appropriate printed and e-formats final factsheets latest during the final 6 months of the project life span (based on a template to be provided by the PMU). There will be a 2-page factsheet for each participating industry that will showcase: the economic and environmental gains, the reduction of industrial wastewater discharges and the resulting improvement in the water quality. The industries can then use these factsheets for their own CSR reporting if so desired. The factsheets will include no confidential information pertinent to the industries (i.e., the work done under the EMA/MFCA tool). The participating industries will, upon signing of their commitment letters, thereby also commit to permitting that these factsheets be produced and disseminated before the end of the project. The aim of generating these high quality materials is to capture the positive impacts of the work and executed best practices in an easily understandable and easy to share format. These factsheets will be widely distributed in relevant forums, workshops and meetings by all the key stakeholders and will encourage cross fertilization, sparking replication and up-scaling endeavours.

Specifically, the aim is that the achieved TEST results and these factsheets will be showcased towards the end of the project in 4-targeted seminars for a minimum of 80 participants (1 in each project area), organized and supported by the NCPC-TU, so as to provide an opportunity to share the examples of the applied best practices and the attained impacts and results to other industries that were not part of the project. The audience is also expected to include the fora and multi-stakeholder partnership actors under Output 1.2.

Selected participating industries under the project for this component will be encouraged to participate in these workshops to share first-hand their experiences and results with the audience. The interlinked and complementary work carried out under all of the Outputs under this component will flow together into these dissemination workshops. All information will be shared and will flow into the work of Component 4 of the project to facilitate the dissemination of lessons learned and results. This effort to promote and thereby encourage and facilitate the replication of these activities in other areas of the GoM is supported in light of the fact that past experiences in Mexico, as well as in the other countries where the TEST methodology and integrated approach is being applied have resulted in follow-up activities and investments.

Output 1.4: Implementation of the Environmental Monitoring Programme

The development and establishment of the Environmental Monitoring (EM) Programme will build on the results of the Environmental Monitoring and Assessment pilot project, completed during the SAP Development Project. This pilot provided the basis for bilateral cooperation and established a consistent design for monitoring of the LME (Independent Final Evaluation, 2014). The EM Programme will take into account coastal lagoon, beach area and ocean water quality data collected by CONAGUA, as well as information and data generated by Activities 1.1.1 and 1.2.2 (Water quality monitoring stations, wastewater treatment plants and national laboratories identified and assessed in priority intervention areas (hot spots); and, Identification of industrial pollution reduction priorities, respectively).

The Executing Agency for the coastal conditions monitoring programme (Activity 1.4.1) is the Center for Research and Advanced Studies (Centro de Investigación y de Estudios Avanzados—CINVESTAV). CINVESTAV is a decentralized body of the Ministry of Public Education (SEP), which was created in 1961 by presidential decree as a public agency with a legal personality and its own assets. It includes 28 research departments distributed in its 9 campuses across Mexico carrying out research in different areas of science and technology to improve living standards and promote the development of the country. CINVESTAV has considerable expertise in coastal condition assessments in the GoM, and is equipped to carry out the required monitoring missions, analyze samples and produce GIS maps. In addition to developing institutional agreements with the Mexican Ministry of the Navy (Secretaría de la Marina - SEMAR) and the Veracruz Reef System National Park to build on their expertise and optimize available resources, CINVESTAV will in the course of its work, verify links and pursue collaborative opportunities with Activities implemented under this Component (in particular Output 1.1, Activity 1.1.2 on water quality control and monitoring) as well as with activities to be carried out under the complementary mercury MSP, entitled “Identification and Reduction of Mercury Sources by Promoting Environmentally Sound Management of Mercury and its Wastes Draining to the GoM”.

This collaboration will in particular focus on activities related to the Sediment Quality Index (see table below), which requires analysis of heavy metals present in the sediments. By sharing sampling points for example, the mercury analysis data that will be obtained by the complementary mercury project will be used by the GoM-LME project. This approach will be actively pursued given the high cost of the laboratory analyses, some of which are carried out in the United States; this sampling point overlap will also open the possibility to more comprehensive data analysis by both projects by increasing the number of indicators measured.

The Executing Agency responsible for the development of the web-based integrative data platform related to the early detection and monitoring of algal blooms (Activity 1.4.2) that will facilitate open access to environmental and health related information is the National Commission for Knowledge and Use of Biodiversity (Comisión Nacional para el Conocimiento y Uso de la Biodiversidad—CONABIO). CONABIO is a permanent inter ministerial commission whose mission is to promote, coordinate, support and carry out activities aimed at increasing awareness on biodiversity, conservation and sustainable use, for the benefit of society. It was conceived as an applied research organization, sponsoring, generating and compiling information regarding biodiversity, developing capacity in the area of biodiversity informatics, and acting as a publicly accessible source of information and knowledge. CONABIO sponsors basic research that generates information, which it compiles, seeking to develop capacity in the area of biodiversity informatics, and acting as a publicly accessible source of information and knowledge. As the repository for all biodiversity related data, including marine and coastal data, CONABIO has proven experience as regards the acquisition and generation of environmental information and information systems. In addition, CONABIO previously partnered with the SAP Development Project and continues to operate and maintain a buoy provided at the time. This buoy has the capacity for acquisition of oceanographic parameters such as current speed and

direction, conductivity, salinity, temperature, atmospheric pressure, water quality, algae related parameters and others. This data is transmitted via NOAA's GOES-13 satellite and published in real time[34].

The data generated by these monitoring activities, and the implementation of a web based platform to make it easily accessible, will provide valuable information and a set of tools that can be used to support the implementation of other Project Components, or be used by other partners, to assess the environmental status of the GoM, and that will as well support informed decision-making regarding protected areas, land use and exploitation of natural resources in the GoM region.

1.4.1 – Coastal conditions monitoring programme

CINVESTAV, as Executing Agency for this Activity, will establish a no-cost cooperation agreement with the SEMAR, the National Institute of Ecology and Climate Change (Instituto Nacional de Ecología y Cambio Climático—INECC) and the Veracruz Reef System National Park, to build on previously acquired expertise and optimize available resources. During the SAP Development Project for example, sampling was successfully carried out with the collaboration of the Veracruz Reef System National Park. The evaluation of the observed environmental changes and the reports produced by these partner institutions will also constitute a fundamental source of information and will provide inputs (data) for the next and final Activity under this Output.

A minimum of 12 monitoring sites, amongst which 3 having been previously monitored during the SAP Development Project will be identified, and 6 will be selected during the first year of the project. Given that SEMAR carries out seawater quality monitoring across Campeche, Tabasco, Tamaulipas, Veracruz and Yucatan, the selection of common sampling points will optimize resources and provide access to information already collected by the Navy Ministry. Selection of the sites will also take into close consideration the intervention areas selected by the other Activities under this Project, the objective being that of capitalizing on the results from previous interventions, as well as ensuring strong capacities are established in support of the long-term sustainability of the interventions. The sampling protocols, in line with the table below, that will be put in place by CINVESTAV for the monitoring program will also take into account the sampling points and requirements of the complementary mercury MSP.

Candidate sites will include mangrove sites restored during the SAP Development Project, namely the Terminos Lagoon (Campeche), and the Celestun estuary (Yucatan), to evaluate their success. In addition to these sites, the aforementioned project also carried out a coastal condition monitoring study in the Jamapa River, Veracruz; consequently, this site will also be considered for selection to take advantage of data already generated by the SAP Development Project and the existing river classification study by CONAGUA. Carrying out the monitoring in the Terminos Lagoon and the Celestun estuary will maximize the project's incidence on these communities, promote synergies and enhance integrated management, in particular given that Component 2 – Avoid depletion and recover living marine resources, and Component 3 – Conserve and restore the quality of coastal and marine ecosystems through community involvement, will also implement activities in these sites.

Taking the above elements into consideration, CINVESTAV will select a minimum of 12 potential candidate intervention areas, and will assess and rank potential monitoring sites on these. From this assessment, 6 final monitoring sites will be proposed and a report supporting these recommendations, and detailing the proposed monitoring activities and timing will be prepared. The final selection will be validated by the PMU, in coordination with SEMARNAT.

[34] http://www.biodiversidad.gob.mx/pais/mares/boyasmex/holbox.html

Due to the vast geographic area and cost of sampling and logistics involved, the sampling of the 6 monitoring sites will be carried out by CINVESTAV during years 2, 3 and 4 of the project. The sampling and monitoring by CINVESTAV using its own equipment will allow tracking of the impacts of restoration efforts, which will be complemented by a review of measures implemented by the community to contribute to nutrient reduction (see Component 3, Output 3.1). Building on the results obtained during the SAP Development Project, CINVESTAV will present the results and information in color-coded maps ensuring data comparability and these maps will be widely distributed to relevant environmental managers, and stakeholders. The maps will be prepared further to each monitoring campaign (years 2, 3 and 4) and will be compiled and presented in a final report no later than 6 months before the end of the Project (year 5).

CINVESTAV will organize 3 training workshops on the monitoring methodology to strengthen analytical capabilities of the National Center for Disaster Prevention (Centro Nacional para la Prevención de Desastres—CENAPRED), the Federal Commission for the Protection of Sanitary Risks (Comisión Federal para la Protección contra el Riesgo Sanitario—COFEPRIS), CONAGUA, IMTA and SEMAR, to build capacity in these institutions, ensure that linkages and synergies are established across the Components of the Project, and in support to the sustainability of monitoring activities once this project is concluded. The 3, 4-day workshops will take place during years 2 to 5 and CINVESTAV will support participation of a minimum of 40 participants (each), who will be designated by their respective institutions. The workshops will present an opportunity to strengthen relationships, in support of the collaborative partnerships indispensable for the development of the consolidated data platform and early warning system developed under Activity 1.4.2.

For the monitoring activities, CINVESTAV will use the adapted list of indicators for the Southern GoM established during the SAP Development Project, which ensures data comparability between Mexico and the United States (García-Ríos et al., 2013). This consists of a series of modules: (1) water quality, (2) sediment quality, (3) benthic fauna (4) coastal habitat and, (5) fish tissue, which are used to calculate the Coastal Condition Index (see table below for full set of indicators). CINVESTAV will also determine the need to consider additional indicators for measurement including salinity, pH, coliforms and heavy metals and will strongly emphasize quality assurance and control (QA/QC) for all modules of the monitoring program.

Index	Adapted list of Indicators
Water quality	Chlorophyll a Dissolved inorganic nitrogen Dissolved oxygen Water clarity Dissolved inorganic phosphorus **Harmful Algal Blooms (HAB's)** Nitrites Nitrates Ammonia % Oxygen saturation Total suspended solids Enterococci
Sediment quality	**Contaminants** Polycyclic Aromatic Hydrocarbons (PAH) Metals Chlorides Sediment toxicity with *Ampelisca abdita* test Total organic carbon
Benthic condition	Biotic integrity index based on community characteristics and biomass assessment of indicator species

	Benthic index based in the relative abundance of sensitive, tolerant and resistant species
Coastal habitat	Wetland loss rate **Sea grass** Sea grass – seaweed relationship Covertures Biomass Density Species composition
Fish tissue	**Contaminants** Polycyclic aromatic hydrocarbons (PAH) Metals Chlorides **Biomarkers** Cytochrome P450 1A gene (CYP1A) expression Vitelogenin expression Glutathione transferase Catalase

Final monitoring results will be analyzed in year 5 by the CINVESTAV and a report will be prepared prior to the Projects completion, comparing data obtained with that of the National Coastal Condition Assessment from the U.S. Environmental Protection Agency (EPA), the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Geological Survey (USGS).

1.4.2 - Collaboration with existing/upcoming information systems

Improving open access to environmental information is an important aspect of this Component in particular, but also of the Project as a whole, in particular given the fact that there is a considerable amount of data available to the public, which however is currently dispersed across different institutions in Mexico and not always easy to access. CONABIO as Executing Agency for this Activity will be responsible for the development, testing, rollout and maintenance of a one-stop web site (web-based platform) that will integrate information generated by relevant public institutions currently monitoring, as per their respective legal mandates, environmental and health related parameters. Each institution has committed to be responsible for generating, monitoring and maintaining their databases including data quality (Open Access) for all data and products generated (also historical data) as part of their monitoring programs. In addition there will be an institutional responsibility to make all data available (such as through web services and/or databases) to all project participants in digital format so that it can be assimilated by other web-based platforms. CONABIO will integrate these historic databases and current real-time environmental parameters obtained in-situ through buoys and satellite tools, in close coordination with academic institutions and population from the region.

CONABIO will develop, test and deploy a web-based Early Warning System (EWS) for early detection of algal blooms, including potentially harmful algal blooms (HABs – or red tide events). This web-based platform will inform national institutions such as COFEPRIS, in charge of emitting public alerts related to the presence of algal bloom events (harmful or not). CONABIO will design the EWS to include information relative to a priority set of parameters that will activate an alert when peak concentrations of these parameters are approached or reached. In order to determine these parameters, representatives of institutions carrying out monitoring activities will be convened by SEMARNAT in year 1 to participate in a meeting to assess and select the priority parameters, and to establish mechanisms to determine trigger levels for this EWS. These could include parameters, which are currently monitored by institutions such as CONAGUA, SEMAR, the Federal Commission for the Protection of Sanitary Risks (Comisión Federal para la

Protección contra el Riesgo Sanitario—COFEPRIS), and CONABIO in key points in the Gulf of Mexico. EPA's Microbial (Pathogen)/Recreational Water Quality Criteria will be taken into account during the selection of the pathogens, chemicals and/or pollutants that will trigger the alert. CONABIO will document the process and prepare a report summing up the decisions and timeline for execution.

Although there is still much uncertainty about the causes of Harmful Algal Blooms (HABs), there is much certainty about their environmental, social and economic impacts. HABs have such an accelerated metabolism that strong impacts can be felt in only hours. Generating ex-ante information on the factors that trigger HABs and developing tools and evaluation methods to analyze them rapidly, in order to contribute to an early warning system is of primordial importance for Mexico.

In developing the web based HABs system, CONABIO will build on the different efforts aiming to collect and analyze HABs related data, ex-post i.e. once a bloom has taken place and has been located, as well as on information dissemination and alert systems. For example, COFEPRIS, CONABIO, CONAGUA and SEMAR generate information on water quality. COFEPRIS obtains, through direct in-situ sampling, HABs related information and evaluates their impact on human health and bivalves productivity. It disseminates this information to prevent impacts on health of the population (radio, newspapers, etc.) in close coordination with CENAPRED (http://132.248.68.83/portal/index.php/riesgos-sanitario-ecologicos/marea-roja) and has the authority to put in place contingency plans and closures (http://www.cofepris.gob.mx/AZ/Paginas/Marea%20Roja/lineamientosMR.aspx). CONABIO generates, analyzes and integrates HAB´s information on its webpage (http://www.biodiversidad.gob.mx/mares/). SEMAR also collects information on physical and chemical parameters and integrates data into its Oceanographic Information System (http://digaohm.semar.gob.mx/oceanografia.html).

As part of an integral environmental monitoring system for decision-making, CONABIO will also organize and support 2, 2-day workshops for a minimum of 30 key stakeholders from relevant participating institutions from this Project, to facilitate and encourage the interchange of data with Mexican institutions (COFEPRIS, Health Laboratories) and the Institute of Remote Marine Sensing (IMaRS) from the University of South Florida. It is expected this will take place within the first 2 years of the Projects life.

Finally, as part of the platform, CONABIO will design, test and rollout a cross institutional information system to share, in real time, products (in-situ data) generated and managed by institutions such as SEMARNAT, SEMAR, INEGI, UNAM, etc. which will be collected and integrated into the EWS, once an institutional agreement has been put in place (license) and provided the necessary quality requirements for inclusion of the data are met. To this effect, SEMARNAT will designate a project Focal point who will meet with representatives from INEGI, SEMAR and other relevant custodians of information systems (see list below), and will coordinate with PROFEPA, CONAGUA and IMTA to agree on the exact modalities of SEMARNATs contribution to these information systems, as well as on effective execution of measures required to ensure their deployment and facilitate their eventual sustainability. This mechanism will also include data generated by activity 1.4.1 (monitoring results).

The afore explained Activity will also link to the "HAB, bio toxins, phytoplankton and pollution in bivalve mollusks alerts" in the framework of the National Conference of the Mexican Shellfish Sanitation Program, that includes, amongst other members, COFEPRIS, SEMAR, and the National Center for Disaster Prevention (Centro Nacional para la Prevención de Desastres - CENAPRED). CONABIO, as developers of the platform will also liaise with other systems that are already in place in Mexico to build on their experience and seek complementarities.

CONABIO, as part of its co-financing activities will collaborate with the above cited systems, and any others identified to be of relevance, in the construction of indexes covering environmental and socioeconomic marine aspects, as well as in the generation of information to support other project related activities and decision making processes related to oceans, and capacity building.

This Activity will rely heavily on government co-financing (in-kind) provided by institutions in charge of generating and disseminating data, including SEMARNAT, CONAGUA, CONABIO, IMTA, etc. and will, prior

to project closure, be integrated into the permanent and ongoing Mexican monitoring activities in concertation with CONABIO, which has confirmed they will take this on to guarantee national ownership and sustainability of project interventions.

Component 2: Avoid depletion and recover living marine resources (LMR - Fish and shellfish)

The Transboundary Diagnosis Analysis (TDA) identified insufficient management strategies for living marine resources as one of the root causes for the non-optimal state of the fisheries in the GoM-LME, and the Strategic Action Programme (SAP) identified "work[ing] cooperatively to recover depleted transboundary fish stocks" as Priority Action 1 under action line II.b "Promote Sustainable Fisheries". The TDA also identified the lack of formal bilateral cooperation mechanisms for sharing scientific information and conducting joint stock assessments, as well as the lack of an ecosystem-based approach, as one of the main causes contributing to the depletion of fish stocks in the GoM-LME. Subsequently "cooperat[ing] in information exchange and stock assessments" was retained as Priority Action 3 by the SAP, also under action line II.b.

Sound and comprehensive knowledge on transboundary stocks is the foundation for ecosystem-based management decisions, hence the project will seek to implement a joint assessment on a stock of species of mutual importance to catalyze formal bilateral cooperation, facilitate the establishment of mechanisms for the sharing of scientific information and knowledge and provide advice to managers and policy makers in both riparian countries on the status of that stock.

The 2012 National Fisheries Charter [35] (DOF, 2012) indicates that the status of 179 out of 236 marine species of commercial value on the Mexican side of the GoM is not known; 16% of known ones are however exploited at maximum sustainable yield (MSY), and 7% are depleted. In this regard, Output 2.1 will establish the official mechanism for collaboration between the agencies in charge of fisheries research in the two countries (NOAA in the United States and INAPESCA in Mexico) to develop the joint stock assessment of an important transboundary species. This will be an unprecedented undertaking as, to date, no binational assessments have ever been undertaken in the GoM-LME. The joint assessment will also contribute to the application of an ecosystem based management approach (EBM) to fisheries and will enable the collaborating countries to assess a stock across its full distribution within the GoM, (as required for EBM), instead of only within the relatively limited range of each country's jurisdictions.

Component 2 is divided into 4 interlinked Outputs and that will collectively contribute to reducing depletion of selected stocks, in support of the recovery of marine resources. *Output 2.1* will support preparation of uniform scientific advice on the status of a stock of mutual importance in the two countries; *Output 2.2* will support the production of a new FMP in Mexico and new catch-level advice for an existing FMP in the United States for the king or Atlantic Spanish mackerel fishery (*Scomberomorus cavalla* or *S. maculatus* - status not known); *Output 2.3* will support the implementation of existing FMPs for the red grouper fishery from Yucatan (*Epinephelus morio* - depleted), and the brown shrimp fishery from Tamaulipas (*Farfantepenaeus aztecus* - at MSY).

Considering that the bulk of Mexican fisheries in the GoM are compound small-scale fisheries, the project will also pay special attention to this important segment of marine fishery. For this reason *Output 2.4* aims to implement the Voluntary Guidelines for Securing Sustainable Small-scale Fisheries (VGSSF or Voluntary Guidelines) proposed recently by the Committee on Fisheries (CO-FI), a subsidiary body of the FAO Council (FAO, 2014). In order to achieve these objectives, *Output 2.4* will facilitate the implementation of the Voluntary Guidelines in multispecies fisheries of Yucatan, with particular emphasis on: I) Gender Equality, II)

[35] The National Fisheries Charter of Mexico is the official public document that contains a summary of the diagnostic information and comprehensive assessment of fishing activity, as well as indicators on the availability and conservation of fishery resources in waters under federal jurisdiction [General Law of Sustainable Fisheries and Aquaculture (GLSFA, DOF, 2014, Art. 32)].

Sustainable Resource Management, III) Social Development, and IV) Value-Chain, Post-Harvest and Trade, which could be integrated into the FMPs.

As Executing Agency (EA) for this Component INAPESCA will be responsible for the delivery of the required processes to complete Outputs 2.1, 2.2 and 2.3, as detailed below. INAPESCA is a decentralized body of the Ministry of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA). Its mission is to coordinate and conduct scientific and technological research for the sustainable management and conservation of fisheries and aquaculture resources, with the participation and financial support from all sectors involved. It is the only Mexican fishery and aquaculture research institution with national coverage in permanent contact with the fishery and aquaculture sector's development problems and administration. In support of these Activities, CONAPESCA as part of its mandate will provide assistance as/when required. FAO will provide technical assistance under an InterAgency agreement with UNIDO for Output 2.3 and will provide technical assistance for the provision of technical assistance towards the execution of Output 2.4 (see annex H).

Environmental Impacts – Component 2: Avoid depletion and recover living marine resources	Output/ Activity
Component 2 uses ecosystem-based management approaches to contribute to the reversal of the depletion and procure the recovery of threatened marine resources and especially species of mutal concern for Mexico and the United States in the GoM. Sustainable fishing practices will also support protection of key ecosystems that sustain the communities that depend on them.	
• Data collection and sharing efforts on little Scombrids including king mackeral and Atlantic Spanish mackerel will provide better understanding of information gaps for these ecological important species.	**2.1.1**
• US-Mexico information exchange meetings on transboundary stocks and species of interest will result in selection of a fish stock for joint assessment	**2.1.2**
• A Joint Stock Assessment will allow assessement of the status of resources, impact on wild stocks and testing potential management strategies.	**2.1.3**
• Validation of the Joint Stock Assessment will support sustainable and responsible fishing as part of Mexico's Fisheries Management Plan for the joint stocks.	**2.1.4**
• Newly developed and updated ecosystem based management plans for little Scombrids in Mexico and the United States will support rebuilding of the population across its distribution.	**2.2.2**
• Work through fishery management committees will result in red grouper stock being rebuit to at least 80% of B_{MSY} and at least 10 no-take zones will be declared with the participation of fishers.	**2.3.1**
• Outreach efforts with local fishers will support adoption and ownership of management plans crucial to their effective implementation.	**2.3.3**
• Ensuring compliance and effectiveness of fisheries management plans through monitoring and evaluating stress reduction, environmental status and socio-economic status indicators and targets will result in improved human well-being and enhanced ecosystem conditions.	**2.3.4**
• Raising awareness and building capacity for sustainable management of small-scale fisheries will help reduce illegal and unreported catches to protect wild fish stocks while supporting local livelihoods. With the effective implementation of FAO voluntary guidelines for securing sustainable small-scale fisheries, estimates suggest that overexploitation of fish stocks, including Spanish mackerel, grouper and shrimp, in the GoM will be significantly reduced by an estimated 61,000 tonnes.	**2.4.1**
• The minimum legal size to catch red grouper will be enforced and the season closed to fishing in order to effectively protect spawners, with 200 artisanal and 100 semi-industrial vessels withdrawn from the red grouper fishery. At the same time, at least three no-take zones will be declared with the participation of fishers to protect red grouper juveniles.	**2.4.1**
• Support for women members of post-harvest groups, including through community environmental education programs, will lead to improvements in solid waste (through co-financing) and wastewater treatment management.	**2.4.2**
• Small-scale fisheries guidelines and ecosystem approaches to fisheries management will seek to preserve wild fish populations and the ecosystems that sustain them while ensuring socio-economic sustainability by identifiying sites of interest for conservation.	**2.4.3**

Output 2.1: Implementation of a joint stock assessment

This Output aims to provide relevant technical assistance to improve the knowledge on an ecologically, commercially and socially significant species of small tunas, on the Mexican side of the GoM. In this sense, species with the highest catches in the GoM are considered to be king mackerel (*Scomberomorus cavalla*) and Atlantic Spanish mackerel (*S. maculatus*). For Mexico and the United States, official statistics show that annual landings of these small tunas are of around 21,000 metric tons, with a value of US$29 million, in addition to the benefits generated by recreational fisheries.

Collaboration on a joint stock assessment will allow both countries to achieve a better understanding of their dynamics and ecological role throughout the ecosystem. Ultimately, this Output's Activities will contribute to improve management, conservation and sustainable use of stocks of species that provide significant welfare to small-scale fisherfolks in the GoM.

2.1.1 – Pooling of existing data

Having recognized the ecological importance of king mackerel (*Scomberomorus cavalla*) and Atlantic Spanish mackerel (*S. maculatus*) in the GoM, and in light of the mutually recognized importance of promoting their conservation and sustainable use, under this first Activity INAPESCA will appoint from its staff a Core Group of scientists involved in little scombrids activities and will support and facilitate their efforts to access, collect, centralize and analyze existing information on little Scombrids (Scomberomorus sp.). Current research activities from the ongoing little Scombrids Project being carried out by INAPESCA will serve to support these data collection efforts by incorporating specific activities for king mackerel (*Scomberomorus cavalla*) and Atlantic Spanish mackerel (*S. maculatus*). Regional INAPESCA offices will also support data gathering efforts, in particular those located in Veracruz, Tampico, Campeche and Yucatan. The Core Group will as well reach out to Mexican and U.S. like-minded research institutions, if/when their research results and/or experience are considered to be of use and/or of direct relevance for these species, and to the Project.

This body of knowledge will be centralized and referenced, in order to facilitate data compatibility and comparability, the Core Group will review and pool existing data and present the information obtained in the format followed by NOAAs Southeast Data, Assessment, and Review cooperative process (SEDAR [36]) for data inventories (Table 1). The results will support the preparation by the Core Group of a Preliminary Data Gap Analysis for mackerel species of the GoM-LME, which will as well verify collaborative opportunities with universities and research institutions that could contribute to fill any of the identified information gaps. These templates will also be used as the starting point for the first iteration of the Mackerel Fisheries Database (see below).

[36] SEDAR was initiated to improve planning and coordination, as well as quality and reliability, of stock assessment activities, which it strives to achieve by providing an open and transparent approach for development and review of scientific information on fish stocks "considered critical to management decision-making" (http://sedarweb.org)

Table 2. Data inventory format for the assessment of Atlantic Spanish and king mackerel fishery - National Marine Fisheries Service (NOAA)

Landings Data
Commercial Handline
Commercial Gillnet
Shrimp bycatch
Recreational Headboat
Recreational shore (beach, jetty, pier, etc.)
Charter-Private

Indices of Abundance
Commercial Handline
Shrimp bycatch effort index
Recreational Headboat
Charter-Private
Shrimp trawl survey

Length Composition of the Catch
Commercial Handline
Commercial Gillnet
Shrimp bycatch
Recreational Headboat
Charter-Private

Biological Information
Age & Growth
Sex Ratio at Size
Fecundity
Age and Size at Full Maturity and at 50% Maturity
Discard Mortality rate

Discards
Commercial Handline
Shrimp bycatch
Recreational Headboat
Charter-Private

Age Composition
Commercial Handline
Commercial Gillnet
Shrimp bycatch
Recreational Headboat
Charter-Private

Data Type
Tagging
Otolith shape
Genetic

INAPESCA will organize five, four-day workshops (one per year) and will invite and support a minimum of 15 Mexican and of five U.S. scientists, to participate in this collaborative cross-lab calibration and information exchange process (focusing, among others, on otolith aging data). These capacity building workshops will provide a series of opportunities to establish and/or strengthen links and collaboration between scientists of both countries and “no-cost” partnerships for ongoing data exchange, in support of the GoM-wide Mackerel Fishery Database. The Database will be designed by the INAPESCA and made accessible through its website, using as a staring point the data formats prepared by the Core Group and setting a common baseline for this fishery. The web-portal will offer continued access to an up to date science-based source of data and information, indispensable for the development of stock assessments, and supportive of longer-term decision making processes. This data will be updated by INAPESCA, as/when necessary for example after the annual meetings of the Core Group of Scientists or as/when key new, relevant information becomes available.

2.1.2 - Establish the Bilateral Assessment Team and select stock to be assessed

Although NOAA-NMFS and CONAPESCA-INAPESCA participate in the annual MEXUS-Gulf reunions and exchange information and project results on transboundary stocks and species of interest no joint stock assessments have been conducted for any transboundary resources.

In line with the objective of promoting greater cooperation between the two parties, INAPESCA will seek to catalyze a higher degree of scientific dialogue by facilitating and supporting the creation of a Bilateral Assessment Team (BAT) that meets the existing SEDAR standards. Five scientists from each country will be appointed to the BAT and invited and supported to participate in the five-day Joint Stock Assessment Inception Workshop. This will be organized by INAPESCA, immediately before (back-to-back) with the Official Launch of the Stock Assessment Process (see 2.1.3, below). The BAT will, based on a set of mutually agreed criteria, select the stock to be assessed and will prepare a preliminary list of identified gaps that would need to be filled, in support of future assessments. This meeting will include 2 days during which representatives from the scientific community (academia) will be invited to assist the BAT with the validation of the Preliminary Data Gap Analysis verifying collaborative opportunities and with the selection of the stock to be assessed. The format of the Inception Workshop and the modalities of these interventions will be at the discretion of the BAT, supported by the INAPESCA, and with the technical assistance from NOAA.

In subsequent years, INAPESCA will organize regular meetings and will support participation (travel, per-diems) of the BAT scientists from Mexico and the United States, who will meet either in the United States or Mexico, if possible/practical on a rotating basis. One, 2-day meeting will be organized during year one prior to the 5-day workshop corresponding to the Inception Meeting, three per year during years 2 and 3 of the Project, and two for years 4 and 5.

The Inception Workshop organized by INAPESCA, with the support of the PMU will, amongst others, allow the BAT members to agree on the criteria for the selection of the stock to be jointly assessed and, further to the evaluation of the quality of data available from both countries (e.g., landings, fishery-independent, stock structure, biological samples), and with the support of the invited representatives of the scientific community, to select the stock to be mutually assessed. This evaluation will be based on a review of the existing data series as well as on the preliminary Data Gap Report. Recommendations on data collections for future assessments, supported by the Preliminary Data Gap report and results from this inventory and evaluation process will be included in the data section of the report of the Joint Stock Assessment (see below).

2.1.3 - Conduct assessment

The Official Launch Workshop for the Joint Stock Assessment Process will take place no later than end of year 1, immediately after the Inception Workshop (back-to-back). This 2 day multi-segment workshop, organized by INAPESCA with the support of the PMU, will be designed to facilitate interaction between the different stakeholders, to maximize buy-in and mobilize support to pave the way for the successful completion of the Assessment. The workshop will provide an opportunity to present the objectives and timeline of the Project and to review the process in place to achieve these, and serve as a platform to announce and highlight the development by Mexico of a management plan for king mackerel or Atlantic Spanish mackerel.

The workshop will open with a high-level segment that will provide the opportunity to sensitize decision makers and raise awareness regarding opportunities provided by this historic undertaking; this will be followed by a technical meeting to present the results of the Data Gap Analysis carried out under Activity 2.1.1 and agree on next steps, and will conclude with an open forum where results will be presented. Key stakeholders from both countries will be invited to participate/observe including officials of the National Protected Areas Commission (Comisión Nacional de Áreas Naturales Protegidas—CONANP), CONAPESCA, Gulf of Mexico Fishery Management Council appointees, INAPESCA, National Oceanic and Atmospheric Administration (NOAA), SEMARNAT, state governments, the navy, commercial fishing associations, anglers associations and academia, among others.

The principal objective of the technical segment of the workshop will be to review the gaps that need to be filled (based on the Gap Assessment prepared by the BAT under Activity 2.1.1, above), and agree on the nature, source(s) and process to be undertaken to obtain and then integrate the additional data in future

assessments, resulting in a Report on Next Steps to be taken in the assessment process. In this, the BAT will assign research tasks, and will seek the collaboration of other specialists if for example stochastic methods and likelihood analysis to integrate a biological model, such as stock-synthesis, are determined to be required for the Assessment. In order to ensure the best use of resources, the BAT in the determination of next steps will follow similar mechanisms that have been proven and time-tested, in particular by NOAA.

Technical guidance and expertise from NOAA will be provided during this workshop (as well as through the BAT), to select and apply the most appropriate tools to extract required information (statistical data analysis, time series analysis, models of dynamic assessment, risk analysis, uncertainty and decision theory, etc.). NOAA will also make available to the Project, through the BAT, information required for the preparation of the Joint Stock Assessment, in particular as relates to the highly migratory nature of the stock.

Technical assistance from INAPESCA will include the selection of the evaluation methods and analysis of the data, such as age and growth analysis, natural and fishing mortality estimates and dynamic population analysis, as well as surplus production dynamic models and migration along the GoM. The analysis of climate effects, in particular sea surface temperatures, will be included and results integrated into the Assessment to the extent possible.

The data obtained from the ongoing acquisition and analysis of additional parameters (otolith analysis, cohort analysis of landing data, natural mortality estimates from catch per unit effort, catchability coefficient and carrying capacity estimates, etc.) will require access to specialized equipment. In order to strengthen the capacities of the INAPESCA and to facilitate ongoing acquisition and analysis of data on this, as well as other species, the Project [37] (through the PMU) will acquire specialized equipment (including, high-speed otolith sectioning (OS) system, spectrometer (ultraviolet or visible spectrum), hydro-acoustic systems, electronic tags, etc. based on technical specifications prepared by INAPESCA). The resulting information and supporting data will be included, to the extent possible, and time permitting, in the Joint Stock Assessment Report prepared by the BAT and will be used as the basis for future updates of the Assessment. This will as well be made available on-line through the Mackerel Fishery Database developed under Activity 2.1.1.

The BAT, under the guidance of INAPESCA will be responsible for the preparation of the draft Joint Stock Assessment Report entitled *"Status of the king mackerel (Scomberomorus maculatus) fisheries in the GoM" or "Status of the Atlantic Spanish mackerel (S. cavalla) fisheries in the GoM"*, which will contain the assessment of the status of the resources, limits and target reference points, analysis of the users and their impact on the wild stocks, migration patterns on both sides of the GoM, biomass and landings forecast as a response to different management measures, *inter alia*. The BAT will also test potential management strategies by extending results from the assessment in simulation models. The draft Assessment will adopt the form of a scientific publication and will undergo a rigorous peer review process (see below).

2.1.4 - Validate assessment

A transparent validation process will be put in place geared to promoting the adoption of high standards and aimed at ensuring the delivery of a scientifically sound and fact based Joint Stock Assessment to the Parties. The BAT will nominate a panel of peer reviewers, representative of both countries; the INAPESCA, and NOAA, through the SEDAR process, will provide terms of reference to peer review the stock assessment.

The BAT stock assessment team will lead the review process and will respond to points raised, comments, questions and/or observations tabled by the referees. The BAT will document the process and all exchanges

[37] Equipment will be procured directly by UNIDO and as such is not considered a responsibility of the INAPESCA. However, ensuring the equipment is inventoried and maintained in proper operating condition will be a responsibility of INAPESCA who will provide a status report by-yearly to the PMU, for the duration of the Project

between the BAT and referees, and resulting modifications to the report will be tracked (matrix of proposals/changes), to guarantee the transparency of the review process. Upon the satisfactory completion of this process and integration of pertinent points in the draft, the BAT will officially present the Joint Stock Assessment results to stakeholders during a one-day Workshop organized by INAPESCA for a minimum of 50 participants. Given mackerel is caught by fishers from different states, it will be of prime importance to ensure participation of local delegates from federal and state governments, including Fisheries Delegates from CONAPESCA, SEMARNAT, CONANP, Navy, State Fisheries Departments or equivalents, from Tamaulipas, Veracruz, Tabasco, Campeche and Yucatan, as well as U.S. coastal states.

The Assessment will form the basis of a new chapter in the *"Sustainability and responsible fishing in Mexico, assessment and management"* report, to be prepared and published by the INAPESCA. This publication contains information on the most important fisheries in the country and to date there is no chapter on mackerels of the GoM. In addition, an updated technical sheet for the little Scombrids fishery will also be prepared by INAPESCA, for inclusion in the National Fisheries Chart, which is the Mexican official publication (Federal Gazette) containing the status of the fisheries resources.

The King mackerel or Atlantic Spanish mackerel Joint Assessment will provide a common scientific basis for the development of Mexico's FMP for these shared GoM resources and the updating as/if required of the equivalent FMPs, and catch level advice in the United States. The FMPs could consider the same biological and ecological criteria, adjusting them to the different socioeconomic contexts and management priorities of the two countries.

Output 2.2: Develop (Mexico)/amend (US) management plans

As detailed above, King mackerel (*Scomberomorus cavalla*) and Atlantic Spanish mackerel (*S. maculatus*) are two transboundary species considered of significant interest by both the United States and Mexico, given their combined capture volume and value, and in light of the additional benefits derived from commercial and recreational fisheries in the two countries. In light of this, the project will facilitate the development or amendment of a management plan for one of these species. This Output will address in particular the TDA recommendation stating that "Information and experience exchanges regarding management strategies and instruments should be encouraged and those on assessment matters strengthened".

The stock assessment conducted under Output 2.1 above will provide the required knowledge base to develop or amend a fisheries management plan (FMP) in Mexico, as well as current related regulatory instruments, to align these with the existing national regulatory framework in place for the implementation of FMPs plans. This information will also provide the basis for catch-level advice for commercial and recreational fisheries in the U.S under an existing FMP.

Cooperation in conducting the joint stock assessment and then in the development of new or adjustment of existing management plans and regulations for this species, aligned with scientific advice based on the productive capacity of the fishery resources, will catalyze a shift in the management of the species towards a more sustainable level. Top top-down management has been prevalent in Mexican fisheries and FMPs are seen as an opportunity to improve this situation by internalizing externalities and supporting the responsible participation of stakeholders, while guaranteeing their rights. This approach will be further developed in Output 2.4, below.

In Mexico there has not yet been an opportunity to fully operationalize the 2007 General Law of Sustainable Fisheries and Aquaculture as regards FMPs. In particular, Article 39, Section III of the Law states that FMPs, which will require that organization, management and participation, including communities be integrated in the Plans.

The Fisheries Management Plans in Mexico include the establishment of a Fishery Management Committee (FMC) to oversee implementation of the plans. To facilitate this process, and although no standardized procedures are in place detailing steps required to develop and implement an FMP, the Project has retained the following three stage approach: 1) Establishment of the Fishery Management Plan Committee, 2)

Elaboration of the Fishery Management Plan and 3) Implementation of the Plan, and monitoring and assessment of fishery outcomes.

As Executing Agency, INAPESCA will be responsible for the delivery of the four Activities under this Output.

2.2.1- Establish the Fishery Management Committee for Little Scombrids

The FMC will be established by INAPESCA, and will operate, according to procedures described in the General Law on Sustainable Fisheries and Aquaculture, as well as in the model developed by the North Pacific Fishery Management Council (2006). These procedures were adopted by NOAA and presented in its Statement of Organization, Practices and Procedures (SOPP). In particular, the Committee as required by law, will be supported by INAPESCA to meet at a minimum twice a year over a 5-day period.

The FMC will have between five and seven voting members, and non-voting members, and its geographic area of authority will be determined by the approved plan. The FMC will be integrated by:

- The State official in charge of marine fishery management, who will be designated by the Governor of the State, so long as the official continues to hold such position, or the designee of such official (Honorary President);
- The State Delegate of CONAPESCA, so long as the Delegate continues to hold such position, or a designee (Executive President).
- The Chief Investigator in charge of the Regional Center for Fisheries Research in the State, appointed by INAPESCA, so long as the Senior Scientist continues to hold such position, or a designee (Technical Secretary).
- One member representing the artisanal fishers, appointed by the State Delegate of SAGARPA and endorsed by the Governor (Member).
- One member representing the industrial fishers, appointed by the State Delegate of SAGARPA and endorsed by the Governor (Member).

All decisions will be taken by a majority vote according to the principles set out in the General Law. A majority of the voting members of any Committee constitute a quorum for Committee meetings, but one or more such members designated by the Council may hold hearings. Decisions of any Committee are by majority vote of the voting members present and voting (except for a vote to propose removal of a Committee member). An abstention does not affect the unanimity of a vote. At the request of any voting member of the Committee, the Committee shall hold a roll call vote on any matter before the Committee. The official minutes and other appropriate records of the Committee meeting shall identify all roll call votes held, the name of each voting member present during each roll call vote, and how each member voted on each such vote.

A vote will be required for Committee approval or amendment of the FMP, including any proposed regulation following established administrative procedures; this will increase transparency in decision making since in the past, centralized decisions have become a hindrance in fisheries management.

The Committee, through INAPESCA will bring on board staff (at a minimum an Executive Director (ED – on a part-time basis), to support additional tasks required to facilitate implementation of the FMP, and organize documents and schedule meetings. Given this position is not considered under the existing organization chart of INAPESCA, the Project, through INAPESCA will provide resources to initially support the activities of the FMC. CONAPESCA will take the necessary measures to ensure the continued operation of this FMC and will assume this responsibility for a full-time ED no later than one year after the date of publication of the FMP.

The ED will report to and be held accountable by the FMC. The Committee may contract experts and consultants as needed, based on available funding, to provide technical assistance not available from INAPESCA, notifying and seeking approval from CONAPESCA and INAPESCA before seeking outside technical advice.

The ED may be dismissed by a vote of the Committee for misconduct, unsatisfactory performance, or lack of funds, with reasonable notice. The FMC will have power to organize other subcommittees to carry out specific tasks to contribute to the achievement of the objectives of the management plan (e.g. Fishing Industry Advisory Subcommittee, Artisanal Fisherfolks Surveillance Subcommittee, *inter alia*), according to the needs and available resources.

2.2.2 - Prepare revised/updated management Plans based on the ecosystem approach

There is currently no management plan for little Scombrids in Mexico and the project will support its development and implementation. In the United States, the current management of mackerel will be updated. Both countries will develop/update their management plans for this straddling fish, based on their own internal administrative procedures; and these will be based on the same biological and ecological information, which will ensure consistency with conservation policies and objectives. This ecosystem based management approach will support the effective rebuilding of the population throughout its distribution area.

In addition to the information required by law, management plans will include: rates and migratory routes, seasonal migration, spatial analysis, and will identify areas for reproduction, and breeding and nursery areas. The plans will also include transparent mechanisms for decision-making, and scientific information will play a key role. Effective national implementation mechanisms and scientific information shared between the two countries will strengthen management. Given Mexico's experience in developing previous management plans, the approach detailed below is considered to be appropriate to guarantee the success of the development and implementation of mackerel management plan.

In close coordination with the FMC, INAPESCA will appoint a technical and scientific team of 10 experts from amongst its staff, and support it to develop the management plan. To this effect, five, two-day consultation workshops will be organized and supported by INAPESCA for the technical and scientific team and the BAT, as well as other relevant technical and/or scientific experts that could enrich the process. The team will for example seek assistance and invite CONABIO experts involved in the Project (under 1.4.2 EMS) to advise on required analysis for the use of relevant GIS information. Further to this, expertise will be obtained to support the analysis process and integrate the document. Cross linkages to 2.1.2 will also be actively promoted, given the BAT's previous experience with preparation of the Joint Stock Assessment. The report prepared by INAPESCA as a result of the meeting will scope out next steps, and will provide a timeline for the development of the management plan.

INAPESCA'S technical and scientific team will develop the FMP in broad consultation and with the support of relevant federal and state authorities involved with fisheries, as well as representatives from fisher communities, NGOs, research institutions, universities and academia, experts and any others that could contribute to improving the scientific soundness of the Plan. Given the species is widely distributed in the GoM, INAPESCA will organize 3, 2-day workshops in three locations (to facilitate participation of stakeholders and reduce distance and costs) and will support (travel, daily allowance) the participation of a minimum of 30 representative stakeholders (including representatives/participants from each of the five coastal states) to present, review and finalize the draft, prior to delivering it to the FMC. The draft management plan will be prepared in accordance to established guidelines followed by previously published FMPs of Mexican fisheries.

Further to this review the Mackerel Fishery Management Committee, supported by INAPESCA, will be in a position to initiate the public consultation process that will conclude with the publication of the FMP in the Federal Gazette.

2.2.3 - Conduct a public review process

The Mackerel FMC will launch the formal public consultation process for the proposed FMP and five public consultation sessions (two days each) will be held in the five coastal states of Mexico. These sessions will be

chaired by CONAPESCA, in its capacity of Executive President of the FMC, and support will be provided by INAPESCA to ensure participation of a minimum of 30 relevant key stakeholders from each of the states (travel and daily allowance). The FMP will be presented and discussed, ensuring that stakeholders have time to review, and comment on the proposed plan.

The Management Plan review process will be exhaustive and inclusive; with participation and consultation of stakeholders, including leaders of cooperatives, fishing groups, chambers of boat owners and officers of the three levels of government. The Plan will be presented and discussed in two-day meetings in each of the coastal states (five) to ensure the broadest possible level of support and buy in. This process will be designed to provide an opportunity to receive feedback from all stakeholders, and observations, comments and questions will be addressed by the organizers and fisheries authorities as/if appropriate and recorded by INAPESCA.

As a result of these meetings the FMC, with the support of INAPESCA will update the FMP, which will be available to the public for consultation. The FMP will be considered approved when all observations have been satisfactorily addressed, within the delays set by law for public consultation processes.

2.2.4 - Finalize and publish the Plan

To ensure the completion, formal adoption and publication of the mackerel management plan in Mexico INAPESCA, through the FMC and the ED will prepare the required documents and comply with administrative and legal requirements.

The final FMP will be officially submitted to SAGARPA-CONAPESCA, for further review after which the document will be transmitted to the Federal Commission for Regulatory Improvement (COFEMER). COFEMER is the federal agency of the Ministry of Economy in charge of analyzing new regulations to ensure that their impact in terms of social benefits are greater than their costs. If necessary COFEMER will engage a process of consultation with other federal agencies (SEMARNAT, Navy, CONANP, Economy, General Administration of Customs, Foreign Affairs, etc.) for this purpose, however if this is not deemed necessary, after the review period has lapsed, the Plan will be considered as approved. Once COFEMER approves the FMP, this will be submitted by SAGARPA-INAPESCA to be published in the Official Gazette.

Output 2.3: Technical support to implement already existing management plans

Mexico is currently trying to move towards more effective fishing regulation systems through the implementation of management plans; however, these being new policy instruments, there is limited implementation experience. Management plans bring together and harmonize other instruments such as Mexican Official Standards (NOM), areas of refuge, fishing concessions, land ordering programs and marine protected areas management programs, among others. In addition, although the published FMPs underwent an extensive consultation process, they are descriptive documents containing information for management, and require comprehensive support for their implementation. In order to help strengthen the management capacities of Mexican fisheries, technical assistance will be provided in support of the implementation of two of the 12 recently published Management Plans.

Given their respective economic and social importance, the FMP for red grouper (*Epinephelus morio*) and associated species, from the Yucatan peninsula; and, FMP for brown shrimp (*Farfantepenaeus aztecus*) and white shrimp (*Litopenaeus setiferus*) from Tamaulipas and Veracruz coasts were selected as models to demonstrate internationally recognized implementation strategies and approaches, and enhance the capacities of Mexican professionals.

NOAA, with 40 years of experience in the development, implementation and improvement of such instruments will support these efforts by sharing experiences and lessons learned. As Executing Agency (EA), INAPESCA will deliver the four Activities under this Output. FAO will provide direct technical support to

the implementation efforts, as well as to ensure the integration the FAO Voluntary Guidelines on Small Scale Fisheries (VGSSF, or SSF), the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGT), Bycatch and Discards guidelines and the principles in the management of fish stocks, considering the socio economic context of the GoM.

It is expected that with this support, and after the successful completion of these demonstrative cases, Mexico will be better positioned to implement approved Management Plans, and elaborate and implement additional ones.

2.3.1- Establish Fishery Management Committees

The Fishery Management Committees (FMC) for the grouper and shrimp fisheries will be established by INAPESCA to support the implementation of the management plans. The two FMCs will be established and will operate on the same model as that described under Output 2.2, Activity 2.2.1 above. The FMCs will each be staffed with at least an Executive Director, and these positions, initially supported by the Project through INAPESCA, will be transferred to CONAPESCA, who will take the necessary measures and assume this responsibility in order to ensure the continued operation of the FMCs, no later than one year prior to the end of the Project. Work through the FMCs will result in red grouper stock being rebuit to at least 80% of B_{MSY} and at least 10 no-take zones will be declared with the participation of fishers.

FAO in its technical assistance capacity will develop background materials for the FMCs including an Assessment Report on Potential Synergies with other programmes and projects (government poverty reduction/social programs, regional fisheries programs such as REBYC II LAC (for shrimp fisheries, etc.) or CLME+. Further to this, and in coordination with the FMCs, FAO will prepare a Report assessing gaps and detailing institutionalized coordination mechanisms and outlining the steps necessary for the successful implementation of the two management plans, in line with the principles of the VGSSF.

2.3.2 – Support effective implementation of existing Management Plans

FAO will collaborate with the INAPESCA scientific team and will coordinate the review of the existing FMPs for shrimp and grouper fisheries. FAO will prepare a report that will verify, and prioritize required steps for their effective implementation, in line with the EBM approach, for consideration of the FMC. This will include organization, support and facilitation of workshops, information exchange and capacity building (see details below).

A team of technical Fisheries advisors (international and national) will be identified and retained by FAO to assist with the development of targeted capacity-development materials[38] to be used during the review process. These materials will be based on agreed international best practices and policies (including international instruments such as the VGSSF, the Voluntary Guidelines Tenure and the Bycatch and Discards Guidelines as well as the most up to date Ecosystem Approach to Fisheries (EAF) methodologies). These materials will also be informed by a collection of relevant case studies on co-management and traditional and informal user rights systems, and the results and work of the REBYC-II LAC project (in the case of shrimp fisheries).

The materials developed by FAO will target two audiences: fisheries officials from Veracruz and Yucatan (CONAPESCA and INAPESCA) and fishers representing 10 communities in Yucatan for the grouper fishery and 20 communities in Veracruz for the shrimp fishery. Two, two-day workshops will take place for each of these audiences (Yucatan est. 10 officials, 40 fishers) (Veracruz est. 20 officials, and 100 fishers). In addition

[38] These materials include brochures, pamphlets, posters videoclips (a minimum of 2, targeted to each fishery), etc. and train-the-trainers documentation and will cover the following: i) introduction to the VGSSF ii) introduction to the VG Tenure and iii) introduction to EAF (Including B&D Guidelines)

efforts will be made to involve representatives of CSO and NGOs, estimated to represent an additional 20 participants.

The workshops will offer an opportunity to select and further train a group of trained-trainers during day three of above referenced workshops (5 for grouper, and 10 for shrimp), who will be supported (financial incentives including travel, costs of participation, provision of materials, support to organize arrange and fund workshops for the trained trainers, etc.) to replicate and build capacities in neighboring communities. A minimum of 10 workshops will be delivered by each of the trained trainers and, through these actions a minimum of 1,000 fishers (for each, grouper and shrimp fisheries) will in turn be trained. FAO will be responsible for ensuring that appropriate reports documenting results of the workshops are provided to the PMU.

2.3.3 - Disseminate the Plans and conduct outreach activities

INAPESCA as Executing Agency will be responsible for the preparation and reproduction of printed materials (pamphlets, booklets, posters) containing summarized and audience appropriate information, easily understood by fishers and other stakeholders, based on the materials drafted by FAO (see above). These will be prepared and distributed as widely as possible with the support, inter alia of local networks, associations, NGOs, CSOs etc.

INAPESCA, through the FMCs and their respective EDs (grouper and shrimp) will support the identification of fishers, leaders, boat owners, businessmen and others, and FAO, in collaboration with the FMC will support the identification of civil society (CSO) and non-governmental organizations (NGO) representatives. These will be invited and supported by FAO (travel, costs for particpants covered by FAO), to meetings to disseminate the plans. INAPESCA will be responsible for these dissemination activities and will organize 12, one-day meetings with small-scale fishers (for a minimum of 40 participants), contacting their leaders, and will also organize four, one-day meetings (for a minimum of 20 participants) with businessmen in the sector, and other relevant stakeholders.

The meetings will include the projection of the materials developed by FAO and short films about the state of the fisheries in the world, to raise awareness of the participants and promote the adoption and ownership of the management plans. Adoption and ownership of the FMPs is considered crucial for their effective implementation and to this effect, the dissemination strategy must be carefully crafted to facilitate the approach with the communities and sensitize them to the merits and benefits of the implementation of the Plans.

Measuring the Plans' approval rating among fishers and the fishing sector will require an understanding of their perception, opinion on new regulations, and points of view regarding newly developed standards and will support greater ownership of the resource. To this effect, a "customer satisfaction survey" will be developed by FAO and used as the basis to prepare two short success stories leaflets (for fishers and industry) for dissemination, providing in turn opportunities to strengthen awareness of the fishers and industry regarding results of improved management practices. This will also provide an opportunity for the FMC to anticipate activities that can help to improve management plans or facilitate their acceptance.

2.3.4 - Monitor compliance/effectiveness of the Plans

In close collaboration with FAO, and with the EDs (Executive directors of the FMP committees), the INAPESCA scientific team will review/extend/tailor/pilot the fisheries management plan monitoring system of the Caribbean Large Marine Ecosystem project[39] and will support its regular application and reporting.

[39] CLME+ - starting in early 2016 and implemented over a five year period

INAPESCA, through the FMC and the ED will assume the continued oversight of the monitoring activities, including their impact on SSFishers and will provide the PMU with reports documenting activities on a bi-yearly basis.

This monitoring framework includes specific “Stress Reduction”, “Environmental Status” and “Socio-economic Status” indicators and associated targets defined with specific attention to achieving impacts, in terms of improved human well being, through enhanced ecosystem conditions. The work by FAO on the Fishery Resources Monitoring System (FIRMS); the establishment by TNC of a sub-regional GeoNode (“CaribNode”) for MPA/MMA-related M&E and decision-support at the level of the OECS member states; CamPam’s online database and IUCN’s work on the “Caribbean Observatory” (BIOPAMA), both for marine protected areas; and the Caribbean Marine Atlas initiative will also be reviewed to identify relevant learning opportunities that could be integrated to the Mexican monitoring framework. As well, initiatives at the global level if/as appropriate will be reviewed.

In this regard, involvement of SSFishers in the definition and contributions to these indicators, as well as public dissemination of baseline as well as progress, will be key. It is expected that objective monitoring of compliance and effectiveness of the Plans through time will facilitate identification of potential improvements in their application.

Output 2.4: Implementation of FAO Voluntary Guidelines on Small Scale Fisheries

In 2015, FAO released the Voluntary Guidelines for Securing Sustainable Small-scale Fisheries (VGSSF) in the Context of Food Security and Poverty Eradication; these guidelines were developed to provide complementary guidance to the Code of Conduct for Responsible Fisheries, with respect to small-scale fisheries. The Guidelines are intended to support, recognize and enhance the role of small-scale fisheries and to contribute to global and national efforts towards the eradication of hunger and poverty. Although, it is notable that many aspects of the Guidelines are being addressed by various agencies in Mexico, a rapid initial assessment reveals that Gender Equality, and Governance of Tenure in Small-Scale Fisheries and Resource Management are issues that require urgent attention (A. Hernandez, 2015).

Lax enforcement of regulations, and insufficient government capacity to oversee an important, but largely self-managed small-scale sector has traditionally skewed interventions and concentrated limited resources on industrial fisheries. With the support of FAO, local fishery authorities and fisher communities will be assisted in performance of activities that will reduce illegal unreported and unregulated (IUU) fishing and improve management of resources. Activities executed under this Output will also address the post-harvest sector (VGSSF Part 2, Section 7), fisheries eco-labeling, gender equality (VGSSF Part 2, Section 8) and alternative livelihoods (VGSSF Part 2, Section 6) to reduce fishing pressures, improve food security and nutrition and poverty eradication. Particular attention will be paid to equitable participation of women, and vulnerable and marginalized groups – in the design, planning and implementation of management measures ultimately affecting their livelihood options.

FAO will provide technical assistance and guidance to implement initiatives that support and foster gender equality in fishing communities in the coastal states of Campeche, Veracruz and Yucatan. Women's groups in 10 communities will be assisted to strengthen their role and measures will be promoted to ensure adequate facilities are available to maintain and improve their livelihoods in these communities. Particular attention will be paid to the postharvest subsector where women represent the main workforce, playing a fundamental role in the local economy and society. The project will also encourage women to actively participate in fisheries organizations and in relevant organizational development. Similarly, women’s equal participation in decision-making processes for policies directed towards small-scale fisheries will be promoted.

As technical partner FAO, in close collaboration with the INAPESCA, will be responsible for the delivery of the three Activities under this Output.

2.4.1. – Establish partnerships to improve data collection and promote research, in support of the reduction of Illegal Unreported Unregulated (IUU) fishing

One of the main reasons hindering the establishment of effective management strategies for small-scale fisheries is the lack of detailed information and data for the fishing sub-systems. In these cases the Code of Conduct for Responsible Fisheries recommends the application of the precautionary approach[40]; however, when decision-makers give priority to wild stocks and environment conservation, over human necessities, natural resources that could support low-income families can be wasted. In addition, under such circumstances, it is reasonable to expect that fishers with limited access to scientific information will continue harvesting these resources with little or no concern for fisheries management. In Mexico for example, unreported and illegal catches represent approximately 31% and 16% of total catch, respectively (Cisneros-Montemayor et al. 2013).

Dr. Alvaro Hernández Flores, professor and researcher with the Universidad Marista de Mérida, has estimated that with the support of the SAP Implementation Project and the resulting application of best practices in the development and implementation of management plans, the effective implementation of the FAO voluntary guidelines for securing sustainable small scale fisheries and the resulting reduction of IUU the following reductions in overexploitation of fish stocks in the GoM can be achieved:

Mackerel	21,000 tonnes
Red grouper	9,000 tonnes
Shrimp	16,000 tonnes
Other small-scale fisheries species:	15,000 tonnes
TOTAL:	61,000 tonnes

This reduction of overexploitation by 61,000 tonnes is equivalent to 2.03% of the 3 million tonnes overall goal for the GEF IW3 Programme 7.

There is evidence demonstrating that numerous small-scale fisheries in different localities and settings around the world struggle and are affected by IUU fishing practices that are varying in nature and cause, and come in many forms. In this regard, the Guidelines (Part 3, Section 11) recommend the establishment of data collection systems for fisheries, to support transparent decision-making processes, for the sustainable management of small-scale fisheries.

In order to reduce and eventually eliminate IUU, it is necessary to raise the awareness and build the capacities of fisher communities as regards the dynamics of their ecosystem, and the impact that their actions can have on maintaining/improving its sustainability. Ultimately the goal is that of supporting actions that assist these communities to develop and implement effective strategies, and to take ownership for the management of their resources. However, without adequate information concerning the effectiveness of such strategies, it is difficult to make informed decisions regarding the most appropriate lines of action that could assist in achieving the optimal utilization and renewability of the fishery resources (Olomola, 1993).

The initiatives of CONAPESCA and INAPESCA directed to fisher communities, including efforts to monitor IUU and identify and recommend specific activities to promote sustainable fishing practices will be strengthened through FAO. FAO experts will conduct research on the different fisheries components, and support the preparation of official statistics. Given this will include socio-economic aspects, FAO will

[40] One of the main reasons for such a recommendation is that in the absence of scientific knowledge, history has demonstrated that in fisheries with lax or no regulatory mechanisms, the system is led to the bioeconomic equilibrium, which is reached in most cases at low levels of biomass or at over-exploitation, with an excess capacity, leading to the loss of benefits by many people

collaborate with NGOs active in this field. Using new communication technologies (real time data acquisition, remote sensing, etc.), it will be possible to increase the accuracy of catch data, and fishing efforts, among other relevant information. This information will be used to establish a Baseline from which to monitor the impact of social intervention programmes in 10 selected communities, and a report documenting the process will be prepared. Based on this, FAO expert(s) will assist CONAPESCA to make adjustments to the National Fisheries Registry (RNP—Registro Nacional de Pesca y Acuacultura) to reflect the practices of artisanal fisherfolks, including estimates of IUU.

INAPESCA will be responsible for organization of 10, three-day workshops for a minimum of 20 participants each (INAPESCA will cover the cost of participation) for local community members and fishers in ten demonstration sites (Campeche, Veracruz and Yucatan) to review these management issues and present potential alternatives, in two small-scale fisheries. FAO will prepare background documents for delivery during these workshops in close collaboration with INAPESCA. Participatory management systems, such as co-management, will be promoted in accordance with national laws (see Output 2.3.2). To facilitate this, FAO and its consultants will also prepare a series of educational materials, presentations, leaflets, videos and media, to expose community members to co-management practices in the 10 communities. This initial series of workshops will also provide an opportunity to select community leaders (and in particular women) and fishers (as well as other relevant stakeholders) that will be further trained in co-management (see below).

These 10 demonstration projects will involve strong collaboration between (social) scientists supported by INAPESCA and representatives of the communities who will participate in data collecting, traditional knowledge contribution (Guidelines Part 2, Section 7.6) to improve management systems, and identify alternative livelihood possibilities, etc. The scientists will visit the communities a minimum of four times in the first two years of the Project. A “customer satisfaction survey” will be developed by FAO and results will be used as the basis to prepare a minimum of two short success stories leaflets (one for each fishery) for dissemination, providing in turn opportunities to strengthen awareness regarding results offered by improved management practices.

FAO, in collaboration with the General Directorate of Inspection and Surveillance of CONAPESCA will develop a curriculum to train CONAPESCA field officers and fishers’ leaders in co-management and will organize 10, 3-day workshops for a minimum of 10 participants (costs for participants covered by FAO), to train and guide them to to play an active role in the transition to improve fisheries management in the selected communities. The participants to these in-depth training workshops will be identified during the first series of workshops delivered by INAPESCA (above). A critical (gradual) path to transit toward co-management including advantages and challenges, will be prepared for each of the ten communities, with the participation of local authorities and fishers.

These activities will result in the preparation by FAO of the report on Status of the Fisheries Systems (including biological, ecological and socioeconomic components) at a local scale but within a regional context. These actions will respond to the Voluntary Guidelines for Securing Sustainable Small-scale Fisheries (VGSSSF) in the Context of Food Security and Poverty Eradication as they will facilitate, train and support small-scale fishing communities to participate in and take responsibility for, the management of the resources on which they depend for their well-being and that are traditionally used for their livelihoods, while taking into consideration their legitimate tenure rights and systems. These actions will be taken into consideration for future public programs of CONAPESCA and other governmental agencies, which can support the fishing sector through loans, in kind, or with technical and administrative assistance.

Finally, the adoption of better management practices in the demonstration sites will be fostered. As communities move forward in the management of their fisheries resources, and improved standards of biological, ecological, economic and social performance are achieved, there will be evidence of improved fisheries management, which in the due time will bring additional benefits to the direct benefits. Given that international seafood markets are attributing greater value to sustainable products through the eco-labeling process, for example that of the MSC (Marine Stewardship Council) FAO will be responsible for undertaking a process to review available certification schemes applicable to both fisheries for the stakeholders to select,

and will assist the 10 communities and stakeholders to undergo a pre-assessment process as a first step towards eventual full certification using the selected scheme(s). This assistance will include a minimum of 2 visits to each community by FAO expert. In this pre-assessment, a qualified conformity assessment body will evaluate, at a provisional level, the fisheries performance against the MSC fisheries standard. This will allow any potential issues in the fisheries' performance to be identified, and enable potential fisheries stakeholders to prepare accordingly for an eventual full assessment. A report documenting the process will be delivered to the PMU prior to completion of the Project.

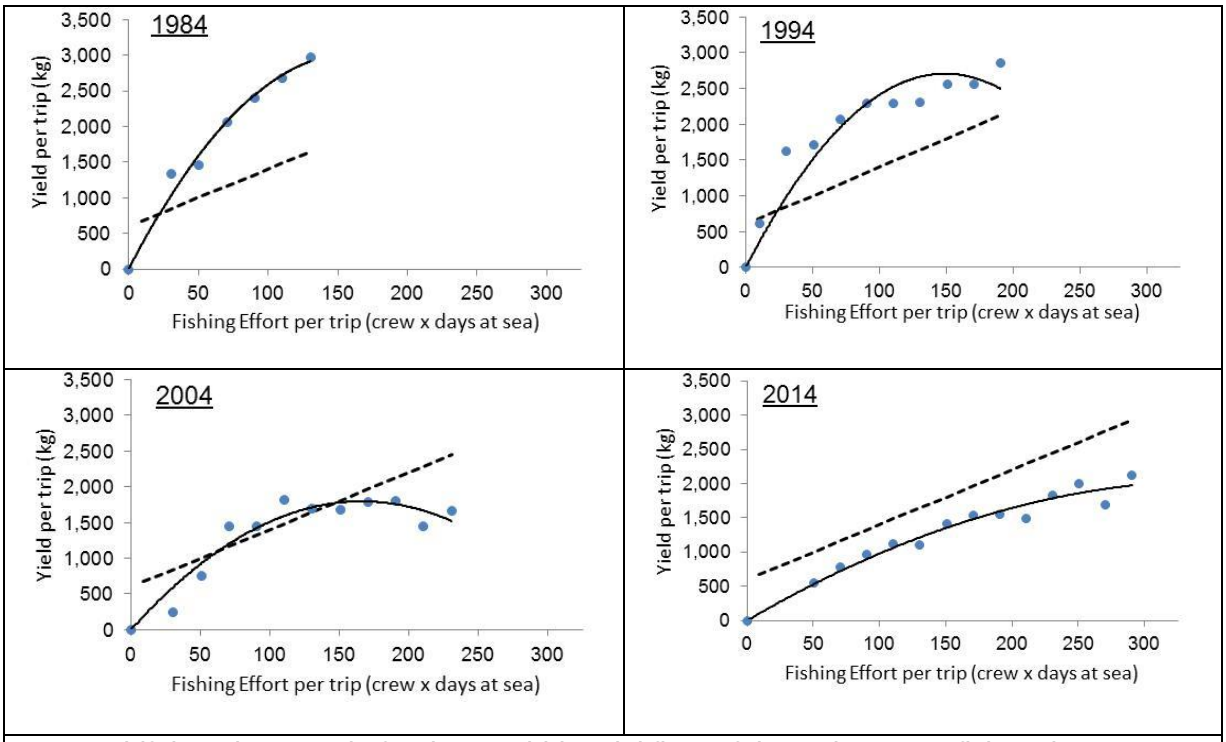
As a result of the above mentioned activities spawners will be protected through, for example, enforcement of the minimum legal catch size for red grouper as well as from the closing of the fishing season and will be further supported by the withdrawal of 200 artisanal fishing boats from the red grouper fishery. Ecotourism related training activities, as well as in other skills provided to fishers, as proposed by the FAO Voluntary Guidelines on scale fishing implementation will contribute to the provision of alternative livelihood options for fishers, and will thus directly contribute to the reduction of the fishing effort. In addition, and in order to adjust the fleet size to the stock size, the project will also support the reduction of the semi-industrial fleet by 100 vessels. The rationale for the federal government to operate this program for the semi-industrial fishery of the red grouper through CONAPESCA SAGARPA, is based on the overcapitalization signs shown by the Yucatan fleet (Fig. 18). This overcapitalization represents a high risk (red grouper fishery collapse) in the next 10 years. As the fleet does not achieve sufficient yields for red grouper per trip to keep operating the vessels (bio-economic equilibrium), the fleet tends to fish less valuable species. Instead of reaching the equilibrium with the red grouper catches, the fleet maintains an effort that is likely driven toward bio-economic equilibrium in conjunction with the catches of other species. This threatens to collapse the red grouper stock.

Given that Yucatan artisanal fishers operate 4,400 small boats (SAGARPA, 2012), the withdrawal of 200 boats from this fleet would represent a reduction of 4.5% of the nominal fishing effort. Similarly, the semi-industrial fleet operates 522 vessels, and withdrawing 100 of these will result in a reduction of 19% of the nominal fishing effort. This program will be modeled and implemented based on a similar one that was initiated in May 2010 and which is still in existence for the shrimping industry in Mexico: the Sustainable Use of Natural Resources Program, operated by SAGARPA-CONAPESCA[41] also known as the Strategic Project for the Voluntary Withdrawal of Shrimp Vessels (PERVEC)[42].

In the case of the minimum legal size for the red grouper (36.3 cm Overall length - SAGARPA, 2012), the project will foster achievement of a significant reduction in the percentage of sublegal fish caught by artisanal fishers. The percentage of the minimum legal size for the red grouper is permanently monitored by INAPESCA, and in 2013 the percentage of undersized groupers in the landings of artisanal fishers was 34% (INAPESCA, 2013).

Likewise, the project will support the reduction by of at least two months of the fishing season for both fleets, to protect the spawning season. These reductions will significantly contribute to the recovery of the stock and the set of measures including also the simultaneous declaration—with the participation of fishers—of at least three no-take zones to protect red grouper juveniles, will change the way both fleets and stakeholders operate to recover the stock to 80 % of MSY. These actions will together result in the red grouper stock recovery.

[41] http://calderon.presidencia.gob.mx/2010/05/abre-conapesca-ventanillas-para-programa-de-retiro-de-flota-camaronera-2010/
[42] https://www.gob.mx/conapesca/acciones-y-programas/proyecto-estrategico-de-retiro-voluntario-de-embarcaciones-camaroneras-pervec



4 year shift in gains per trip for the semi-idustrial fleet of the red grouper fishery in Yucatan (over 10 years). Dashed lines represent the landings per trip required by every vessel to cover the expenses for that trip (cost and prices correspond to 2012 conditions) (from Hernandez et al., 2016).

2.4.2 - Gender equality e.g. through post-harvest groups

In most fishing communities, women and children are considered vulnerable groups. In coastal communities of the GoM, women play an important role, contributing to the local economy, and family income; they perform activities such as processing, trading, and other activities that are not related to fishing, but essential to the family and community welfare. FAO support in this Activity will empower women in 10 fishing communities in the GoM (Campeche, Veracruz and Yucatan) by identifying opportunities to improve their job related skills, initiate or improve their business, create more spaces in civil society for their participation, and receive training in nutrition, health and formal organization for effective participation in the community. Information identifying issues limiting women's participation in the endogenous development of their communities, in their different ecological niches, will be collected for human rights and empowerment based analysis. As well, an analysis of results from previous experiences with small business will be carried out, identifying successful efforts as well as gaps and/or failures; this analysis will help to identify positive actions and to develop ideas to initiate new productive projects. The overall objective is to strengthen the role of women in fisheries development, encouraging and supporting them to participate productively to improve nutrition levels and living standards.

For this, FAO will organize 10, 5-day training workshops for a minimum of 20 participants each (costs for participants covered by FAO), targeted exclusively to this audience, and will seek to verify the main problems faced (family income, nutritional problems, insecurity of women and children, addictions, school dropout, unemployment, health, public services and infrastructure, etc.). The result of this identification exercise will sensitize the audience and facilitate the introduction of improvements in food and health habits. FAO will also use this information to prepare a Report including proposals to improve public services related to education, security, electric power, sewage, waste water collection system, solid waste collection services, accountability of public officials, etc. that will be presented to the PMU. Women will also be encouraged and supported to organize themselves into post-harvest groups (Associations, collectivities, cooperatives, etc.) and will be supported by FAO during these workshops to prepare proposals with the unified collective objective of strengthening their participation in productive activities, through training to improve their skills. The aim is to have at least 10 proposals completed by the end of the workshop and FAO will follow up, in collaboration with the PMU, to ensure the completion and success of the developed proposals.

These women involved in small scale fisheries will benefit from capacity building and support to empower them to engage positively in the process of fisheries management plan improvement, and business development/operation. The set of skills they will have access to will allow them for example to identify new activities with economic potential, calculate costs of production and revenues from household activities and/or from employment within the community, and will reinforce their organizations in a sustainable way, at community level. In support of these activities, FAO will work in close coordination with the National System for Integral Development of Families (DIF – Desarrollo Integral de la Familia) and with the National Women Institute (INMUJERES – Instituto Nacional de las Mujeres), which are the governmental instances in charge of the National Policy for Equality Between Women and Men.

In order to reinforce cross-linkages between Project Components and Activities, and maximize the efficient use of project resources, a Survey will be completed during these workshops, based on the questionnaires developed by Component 3, Output 3.1.2 (Community education programmes focusing on domestic waste water and solid waste), to obtain information regarding the common practices of households as regards solid waste and waste water generation and management. The data obtained through the questionnaires will be analyzed by the EA of Component 3, which will design an appropriate environmental education training programme, targeting women, to improve solid waste and wastewater treatment practices. The PMU will facilitate/coordinate joint activities between EAs of both components.

Opportunities to create synergies and learn from similar activities will also be supported, for example with Output 3.2 under Component 3 (Community based mangrove restoration in selected sites). The strategy implemented by the GoM SAP Development Project successfully developed and applied a methodology to

restore mangrove ecosystems with the active participation of women; hence this activity will engage with Output 3.2 to learn from the results of these workshops, and adapt them to engage women in these initiatives. As for the cross linkages with Output 3.1.2 (Community education programmes focusing on domestic waste water and solid waste), the PMU will facilitate/coordinate joint activities between EAs of both Components.

2.4.3 - Developing/strengthening an enabling environment for Small Scale Fisheries (SSF) management/policy

It is widely recognized that small-scale fishing communities are often characterized by poor living conditions, inadequate services (e.g. lack access to health care), low levels of education and lack of skills necessary to pursue alternative livelihoods (FAO 2000, point 8; Townsley, 1998). The VGSSF in the Context of Food Security and Poverty Eradication (FAO, 2014) mention that poverty in fishing communities is multidimensional and is not only caused by low incomes, resource status or catch levels (Béné 2003), but also due to factors that impede full enjoyment of human rights inluding civil, political, economic, social and cultural rights. Because of the multiple dimensions of poverty and vulnerability, understanding and looking for improvements in SSF requires a multidisciplinary approach. In order to improve fishing communities, the adoption of the Ecosystem Approach to fisheries management will be promoted, and the Human Rights Based Approach (HRBA) will be applied.

With the active participation of fisherfolks, local authorities and other stakeholders, and the support of INAPESCA/CONAPESCA and NGOs, FAO will be responsible for introducing, in ten communities, the principles of the SSF Guidelines and the Ecosystem Approach to fisheries management. This approach will emphasize the need to preserve natural capital, such as wild populations and ecosystems that sustain them, while ensuring socio-economic sustainability. Support will be provided by FAO to fishers and local stakeholders who with the help of FAO facilitators using GIS and GPS, will prepare the zonation of the fishing areas (maps), and identify sites of interest for conservations (e.g., nursery areas, reproduction or spawning aggregation sites) and shared fishing areas by CONAPESCA in consultation with the communities. To this effect, the zonation maps of the fishing areas will be presented in 10 site-specific reports by FAO, and delivered to the PMU, who will convey through official channels, for the consideration of the CONAPESCA.

In order to raise awareness on the importance of these sites, the HRBA will be applied to strengthen human capital to pursue diversified livelihoods. Technical assistance will be provided through FAO for ten, 5-day workshops (costs for participants provided by FAO) for a minimum of 20 participants to support communities and organize fishers in developing integral community-based diversified livelihood projects in no-take zones e.g., ecotourism in tourist-oriented sites (development of project proposal, market analysis, potential financing options, etc.). Similar projects have been demonstrated by the GoM SAP Development Project to provide opportunities to generate extra-income for the households and improve wellbeing of communities. The workshops will provide training for e.g. ecotourism guides (basic English, administration skills, etc.). In addition to potential ecotourism projects, technical assistance will be provided by FAO to identify additional productive projects and opportunities for fishers. These activities will be coordinated and cross-linked with those of Output 3.2 (Community based mangrove restoration), seeking to promote alternative economic activities associated to the restoration sites, whose rationale is similar to the one described under this Output. The PMU will facilitate/coordinate joint activities between EAs of both Components.

The SSF Guidelines promote a human rights based approach to development. They take a people-centred approach which aims at turning resource users into resource stewards, e.g., by empowering small-scale fishing communities, including both men and women, to participate in decision-making processes, and to assume responsibilities for sustainable use of fishery resources. At the same time, the SSF Guidelines emphasise that rights and responsibilities go together. They also recognize that small-scale fisheries do not exist in isolation and promote linkages beyond the fisheries sector to ensure an enabling environment for sustainable development, including through diversified income opportunities and access to social services, as well as through the promotion of policy coherence.

Component 3: Conserve and restore the quality of coastal and marine ecosystems through community involvement and enhanced bilateral cooperation

The priority intervention areas singled out in the SAP include four of the principal watersheds in Mexico and conservation efforts will be directed to specific sites within these large watershed areas that combine a set of characteristics, which if met would facilitate the success of interventions. These characteristics (or criteria) are "component specific", however efforts will be made by all participating Executing Agencies (EA) to develop them taking into consideration Activities being executed under the other Components.

Although the final selection process supported by the EAs will determine the exact intervention sites, the PPG phase consultations concluded that restoration efforts in the Pánuco watershed could be directed to the Tamiahua lagoon (B, in table below) (in the Tancochín watershed, embedded in the Pánuco watershed), or the wetlands of the Tecolutla River (C, below) (in the Tenixtepec watershed, also embedded in the Pánuco); For the Papaloapan and Coatzacoalcos watersheds, these could be concentrated in the Alvarado Lagoon System (D, below) and in the Sontecomapan Lagoon (E, below); for the Grijalva-Usumacinta watershed, in Isla del Carmen and in Atasta Norte (F, below).

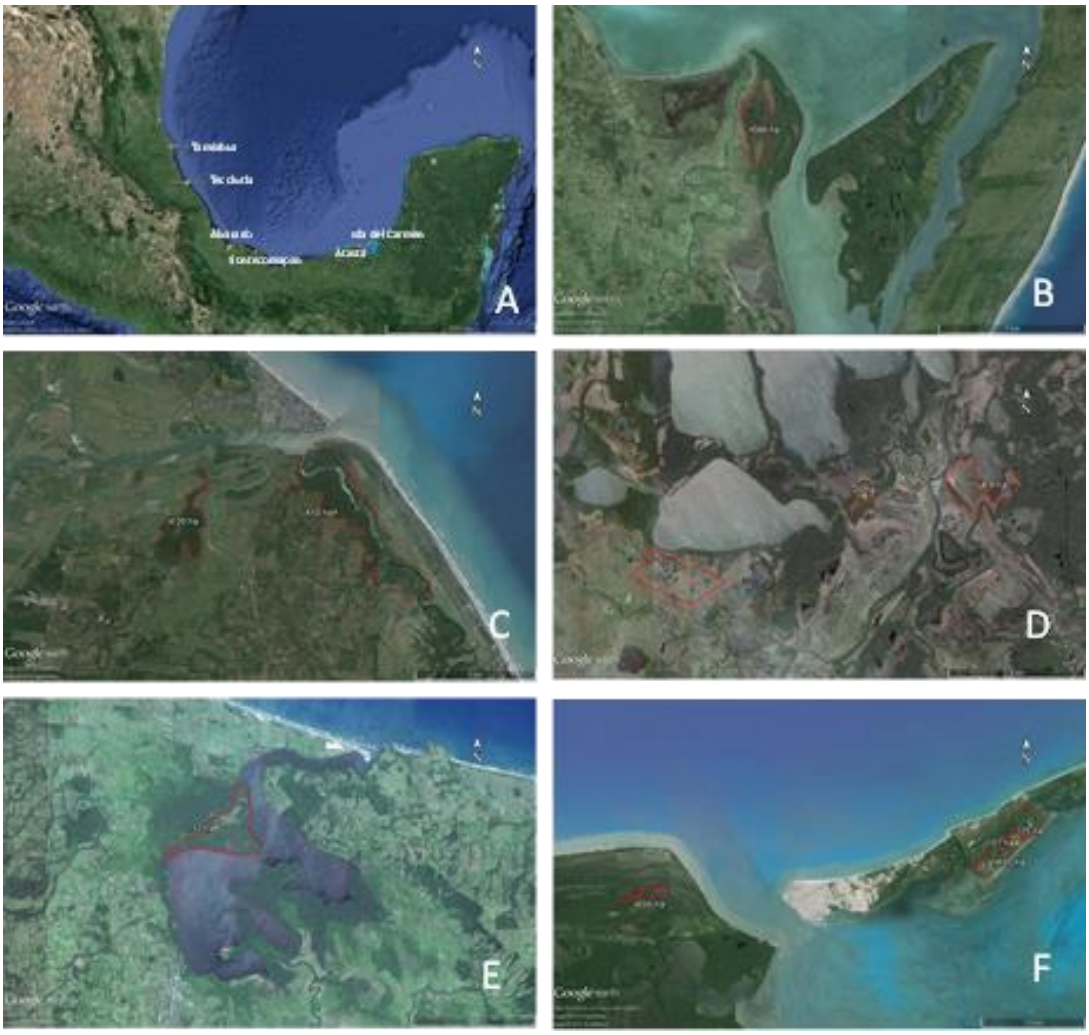


Figure 1 - (A) Location of potential restoration sites along the GoM; (B) Tamiahua lagoon; (C) Tecolutla Estuary; (D) Alvarado lagoon system; (E) Sontecomapan lagoon; (F) North Atasta and Isla del Carmen

The above mentioned sites are all covered by national and international protection statuses including: Priority Lands, Marine and Hydrological Regions (CONABIO), Important Bird and Biodiversity Areas (IBas),

Wetlands of International Importance (Ramsar), Mangrove Sites of Biological Relevance and Rehabilitation Needs (CONABIO) and Protected Areas of Flora and Fauna (CONANP).

The PPG consultations also made it clear that other sites with similar characteristics, even as distant as the Ria Celestún Biosphere Reserve in Yucatan, could be considered as candidates for the project.

The criteria-based selection process for the communities (see below) will also be driven by the EAs, in consultation with the PMU who will support the process, and validate the final intervention sites. This selection process will be critical as the sustainability of community related initiatives depends on the success and continuity of their interventions. This Output will importantly build on results previously obtained by the GoM SAP Development Project and will in particular support mechanisms to strengthen the involvement of women in different undertakings and community initiatives. The GoM SAP Development Project demonstrated that improved housing conditions, offspring education and employment of women have markedly and sustainably changed the status of their communities, which are often classified as marginalized by the National Population Council (Consejo Nacional de la Población - CONAPO).

In addition to the mangroves and wetlands, there are also three coral reef areas in the Mexican part of the GoM that are relatively close to the coast and one further out, on the edge of the continental shelf in front of Campeche. Those nearer to the coast of Veracruz are subjected to the strongest pressure (Ortiz Lozano, 2006; Gutiérrez-Ruiz et al. 2011). Those farther away (in Campeche) or inaccessible (in Los Tuxtlas) are at lower risk due to less direct local impacts (Burke et al. 2012; Ortiz-Lozano et al. 2013). Coral reef and seagrass environments are exposed to overexploitation as well as pollution and sedimentation from continental discharges.

On a greater scale, climate change is contributing to the acidification and mean temperature increase of the oceans, causing structural and functional changes in these shallow ecosystems, and recently reported for Caribbean coral reefs as well (Eakin et al. 2010). In this context, a serious gap relates to documentation relative to the goods and services provided by estuarine lagoon systems, coral reefs and seagrasses, in particular determining their current health status (baseline) to follow up on the rate of change to ascertain the effectiveness of the steps that will be taken to adapt to climate change (Arceo and Granados-Barba 2010).

Environmental Impacts – Component 3: Conserve and restore the quality of coastal and marine ecosystems through community involvement and enhanced bilateral cooperation	Output/ Activity
Component 3 demonstrates clear environmental impacts that will result from direct community involvement in conservation and restoration projects in selected ecosystems with in the four principal watersheds.	
• Education programmes in communities in biologically important areas will train community representatives on effects of wastewater pollution and overfishing and their environmental impat on mangroves, sea grasses and associated species.	**3.1.1**
• Community profiles developed through participative surveys in six communities will identify opportunities for improved waste and wastewater management to reduce their environmental impacts on nearby ecosystems.	**3.1.2**
• Educational workshops will have a direct effect on the amount of nutrients impacting, directly or indirectly, mangroves. The reduction of the pollutant load of an estimated 30% will contribute to the accelerated recovery of the wetlands and mangroves, and of the life systems it supports.	**3.1.3**
• With the direct involvement of local communities in six mangrove and wetland areas, 3,000 hectares will be be restored, improving ecosystems by opening migration paths for new plants and facilitating regeneration.	**3.2.1**
• Restoration activities employing hydrologic restoration techniques introduced in workshops will lead to significant and measurable carbon sequestration, among other environmental impacts.	**3.2.3**
• Linking marine protected areas in the GoM will support US-Mexico collaboration on the conservation and management of marine and coastal resources; improvement in management of MPAs will contribute to the measurable recovery of species they harbor.	**3.4.1**
• Workshops in combination with environmental “scorecard” evaluations of Mexico’s marine protected areas on the GoM will eventually provide information necessary to document positive environmental effects stemming from reduced pollutant emissions into the Gulf.	**3.4.1**

Output 3.1 - Community education programmes on domestic wastewater and solid waste sources

Output 3.1 will support the development and implementation of community based capacity building and education programmes to promote pollution reduction measures. These education programmes, tailored to the realities of the population of a minimum of 6 selected communities will showcase best practices to raise awareness on domestic wastewater discharges and solid waste sources, and promote management actions. Although education plays a central role in solid waste and wastewater management, in order to ensure that solutions are sustainable, key stakeholder groups from the communities must be included in the overall process (i.e., women’s groups, children, etc.) and this should also take into account local knowledge, traditions, customs and habits. All of the activities related to solid waste will be cofinanced by the country and will build in particular on the ongoing work of the CECADESU, the Training center for sustainable development (Centro de Capacitación para el Desarrollo Sustentable). One of these activities provides subsidies to CSOs to improve management of waste. In addition, the Programme to strengthen adaptative and integral capacities (Programa Fortalecimiento de Capacidades Adaptativas Integrales—CEPA), contributes via strategies, communication tools, education and social participation, to the management and

sustainable use of ecosystems, conservation of biodiversity, adaptation to climate change and sustainable use of land.

The principal focus of these interventions is dual, wastewater and solid waste (see Annex for additional information), and each of these streams generates different types of waste and will require its own management (Tchobanoglous et. al, 2002). However, their combined impacts on environment and health directly compromise the potential benefits that can be achieved by promoting actions in favour of ecosystem health (restoration of mangroves and fisheries for example) as well as the development of alternative revenue generating activities, such as ecotourism. Given this, the awareness raising program will also be developed to include information/results from other Activities of the Project or related interventions, for example regarding water quality data or how to proceed in case of pollution peaks (Component 1), or regarding events associated to climate change and sea level rise[43].

Given in particular its extensive expertise in wastewater and solid waste management, environmental engineering, environmental education and community related interventions, the Executing Agency (EA) responsible for the delivery of this Output will be the Autonomous University of Yucatan (UADY – Universidad Autónoma de Yucatan). UADY is a public institution whose mission is to train, with an integral and humanistic approach, open-minded professionals and scientists in and all sectors of society in matters pertaining to wastewater and solid waste management, environmental engineering, environmental education and community related interventions. UADY has committed to tap into, and build on, previously developed capacities and results obtained during the GoM SAP Development Project and to explore potential synergies with activities being executed under other Components of this Project (in particular Component 2).

The Project Management Unit (PMU) will provide on-going technical and administrative support to the EA and will monitor progress of deliverables. This support will include for example assistance in the identification and selection of the potential target communities in the GoM priority intervention areas, identification of community leaders and local officials that could spearhead delivery of the 3 Activities described below, and/or facilitation and provision of administrative support for the effective delivery of the education programmes.

3.1.1 - Verify/select communities for implementation of education programmes

A preliminary list of potential intervention areas was prepared following a multi-stakeholder informal consultative process carried out during the PPG stage. The experts contributing to the different Components of the narrative were asked to present, in tabular form, the intervention areas they considered to be the most promising for delivery of meaningful and sustainable results. This was done in consultation with the Executing Agencies involved and the resulting chart presented below is expected to guide the selection task entrusted to the UADY. One of the first responsibilities of the UADY will indeed be to engage a process to finalize this selection, and verify 6 communities living in these areas, for direct Project intervention.

Given its biological importance, and in order to capitalize on results achieved under the GoM SAP Development Project, two of the communities selected will be located in the Terminos Lagoon area (Campeche). As further detailed under Output 3.2 below, opportunities to build on on-going work in the area were identified during the PPG process including for example, the one presented by the *Mangrove Ecosystem Conservation and Restoration Community Group* (Comunidad de restauradores del manglar de Isla Aguada S.C. de R.L. de C.V[44].). Further strengthening their capacities could contribute to cross cutting

[43] Based on the State Programs of Action on Climate Change promoted by the Mexican Federal Government, which aims at improving the public perception on mitigating emissions of greenhouse gases as well as impacts, vulnerability and adaptation to climate change at the state and municipal levels

[44] Sociedad Civil de Responsabilidad Limitada de Capital Variable - Variable Capital Limited Liability Company

activities within the Project, specifically by seeding a pool of trainers for overarching train-the-trainers activities being executed under this and other Components of the Project (2.3 with the support of INAPESCA, 2.4, with the support of FAO, and 3.2, with the support of the INECOL, etc.).

The other communities (four at a minimum) on GoM identified priority intervention areas will be from Yucatan (2), and Veracruz (2) and the selection process will include criteria and elements common to the Activities executed under the other Components of the Project mentioned above, to maximise synergetic opportunities.

The objective of this cross fertilization is to contribute to raising the capacities of a group of communities, and community leaders representative of the GoM, who are sufficiently well trained to understand and can contribute to, or can demonstrate the broad principles of EBM to other communities managing similar ecosystems in the region. Overall these community representatives would be cognizant of the detrimental effects caused by solid waste and wastewater pollution and overfishing, and their deleterious effects on the ecosystem (mangroves, sea grasses, reefs, etc.) and associated species (spawning, early development, etc.). Cross linking with other Project Activities will be fomented, with the support of the PMU, in particular to Component 2 (support to implementation of management plans, and implementation of VGSSSF) and working with additional communities (i.e. those only linked to one of the SAP Implementation Projects Activities) will be supported by the UADY, as funding permits. This would result in a group of trained trainers cognizant of the general situation, opportunities and challenges of the GoM.

The preliminary list of intervention sites (see below) is based on initial information, which for example is limited for Component 1 (Improve Water Quality) as the identification of areas of intervention will only take place once the Project has initiated. For Component 2 (Fisheries) and Component 3, Activities 3.1 and 3.2 (Community Education and, Mangrove Restoration), criteria considered included: communities located in/or close to mangrove Sites of Relevance[45], in need of ecological rehabilitation, situated in priority hydrological regions, and/or proximity to watersheds, rivers (likely to have a higher environmental impact on the lagoon and coastal ecosystem through discharges); existence of schools and organized groups; access/lack of access to water supply systems, wastewater treatment systems and solid waste management programs.

		Improve Water Quality	Avoid Depletion & Recover LMR	Wastewater and Solid waste	Mangrove Restoration	
TAMAULIPAS	Mezquital***		X			1
	Carbonera***		X			2
	La Pesca+++					3
VERACRUZ	Pueblo Viejo		X		tbc	4
	Tampamachoco		X		tbc	5

[45] "Sites of Relevance" include the Terminos, Alvarado, Sontecomapan and El Ostión Lagoon Systems (CONABIO, 2009). In addition, the Terminos, Alvarado and the Sontecomapan Lagoon systems are Ramsar sites and Terminos and Sontecomapan Lagoons are also Natural Protected Areas (CONANP, 1997, 2003, 2006, 2014, 2015; P. Ladrón de Guevara, 2015).

	Tampico Alto					6
	Cucharas					7
	La Laja					8
	Tamiahua		X	X	X	9
	Tecolutla				X	10
	Alvarado		X	X	X	11
	Sontecomapan				X	12
	Coatzacoalcos	X	X			13
	Boca del Río (Río Jamapa)	X				14
CAMPECHE	Atasta Norte				X	15
	Isla del Carmen			X	X	16
	Seybaplaya		X			17
	Champotón		X	X		18
	Sabancuy				tbc	19
	Laguna de Términos	X				20
YUCATAN	Celestún	X	X	X		21
	Dzilam				tbc	22
	Río Lagartos		X	X	tbc	23
	San Felipe		X			24
		3	**12**	**6**	**6**	

The final proposal of sites will be based on a set of crosscutting criteria (see above), building on previous results of the GoM SAP Development Project, on additional sources of information, and will also consider other intervention activities of the Project. These will be aligned with the overarching goals of the Component (protection of coastal and marine ecosystems) and will be representative of the challenges the Project seeks to address in the broader GoM. To this effect the UADY will review information available from different sources, including but not limited to previous results of the GoM SAP Development Project, and databases (SEMARNAT, CONAGUA, CONAFOR, CONANP, INEGI, state and municipal government offices, etc.).

The UADY will prepare a preliminary list of intervention sites (long list), which will be presented, reviewed and narrowed down to six (plus one back-up) with the PMU, in collaboration with the SEMARNAT. Further to this, and with the support of the PMU, candidate communities from these areas will be identified and individually visited by the UADY and the PMU to confirm/complete the information in support of the final selection. This will ensure that the communities selected are those with the highest likelihood of long-term success. The final selection will be validated with the SEMARNAT by the PMU.

3.1.2 - Develop community profiles in support of development of customized education approaches

Acquisition of current and accurate data, both on wastewater and solid waste generation and management practices in the selected communities, is considered indispensable for the successful completion of this Activity. This data will be used in the design of educational programmes focused on improving good practices and environmental protection activities.

The UADY will design a participatory survey methodology[46] and will prepare and print the required documents (survey forms, didactic materials, posters in sufficient numbers to fully cover the needs of the Project) and in so doing, it will consider, in the design of the activities required for the completion of the survey and diagnostic, local customs, practices and sensitivities, to guarantee full participation of the community, facilitating and encouraging, in particular, full participation of women representatives.

In order to raise awareness and empower the communities to support application of the methodology, the UADY will organize and support a series of initial two-day awareness raising and buy-in meetings in each of the six communities, for a minimum of 60 participants each (travel, costs for participants). These participants will be randomly selected inhabitants who will be identified and approached with the support of the PMU, and invited to participate in the initial meetings to become familiarized with the broad principles of wastewater and solid waste management, as well as with, in particular, potential resulting benefits. The overall target for UADY being that of engaging in the second stage of the diagnostic process, an audience of a minimum of 40 participants (households) in each of these communities, provision of support (including travel (if applicable) and costs for participants), and assisting participants to complete the survey questionnaires (in writing or via interviews), is considered indispensable. In order to achieve this target, it is ultimately expected that between 180 (minimum) and 240 community members (in total for the six communities) will participate in these initial meetings and will complete the surveys.

Considering that the households of participants having completed the surveys during the first meeting will provide the basis for completion of the diagnostic—and development of the community specific Profiles for preparation of the tailored education programs—the community will be informed, and efforts will be made during the initial meetings to secure the engagement (signed commitment forms) of as many households as possible in follow up activities to be implemented by the UADY. These follow-up activities consist of completion of complementary surveys and require household visits that will be conducted by UADY, in coordination with municipal authorities. Over the course of a week, UADY will need to collect information from participating families on the solid waste generated by 40 households in each of the six communities (daily, for seven consecutive days, as per the official Mexican Standards). Information on wastewater generated by these households will also be collected (direct observation and/or questionnaires). In order to compensate families for the time invested in these activities, incentives in the form of an allowance, per day of participation will be offered.

The UADY, based on the data obtained from the surveys will prepare a gap and opportunities analysis, which will in turn be used as the basis to design custom tailored educational programs for the participating communities. The information collected will be analysed by the UADY and two summary reports will be prepared (Solid Waste Generation and Characterization, and Wastewater Management), as well as a compilation detailing communities' current Solid Waste and Wastewater Practices. These documents will include information on solid waste generated per inhabitant (Kg/person/day), characteristics of the solid waste (percentage composition and volumetric weight), location of open dumpsites for solid waste (final deposits), wastewater management, final deposits for wastewater, etc. This will also identify opportunities to improve management practices for each of the 6 participating communities (Community Profile and Diagnostic).

Sample survey questionnaire for each household

Percentage of households with access to a water supply	Do you have drinking water at home?

[46] The surveys will be based on the methodology prescribed by Mexican Standards (NMX-AA-015-1985, NMX-AA-019-1985, NMX-AA-022-1985)

Percentage of households with a waste water collection system	Do you have a toilet and shower at home? Do you have running water for washing the dishes at home? Where is the water from the toilet discharged?
Point of discharge for municipal wastewater: directly into a receiving body or, treatment in a nearby wastewater plant	Do you know where the water from your toilet and shower goes?
Availability of solid waste collection and solid waste disposal practices	Who collects the solid waste generated at home? Do you spread your wastes into your back yard? Do you burn your trash in your yard?
General family information	How many members in your household? How many men /woman How many children
Cultural mores surrounding solid waste management/disposal	Do you follow any practices taught by your ancestors, such as using solid waste as fertilizer?
Local community uses for the mangrove	Do you use wood from the mangrove for any activity at home
Local community uses for the rivers and its products	Do you fish or swim in the river?

3.1.3 – Design and implementation of education programmes

Based on the reports prepared under 3.1.2 above, the UADY will design sets of educational materials for three different audiences and will deliver these during targeted workshops. The education programmes will be tailored to each of the 6 selected communities, based on their Community Profiles, and will be adapted to effectively address 3 broadly defined target audiences in each of these communities: stakeholders having taken part in the development of Community Profiles; women's groups, educators and school children; and a final group comprised of authorities and community interest groups. In support of these workshops, and in order to contribute to the sustainability of the Project, the EA will design and produce written and graphic material targeting the 3 specific audiences identified above.

The educational programmes will include topics such as collection and use of drinking water (improving efficiency), safe management and disposal of wastewater and solid wastes (reduction of health risks via diseases and pollution) and will aim to sensitize the population on their dual role as polluters and beneficiaries of wastewater and solid waste management. This approach is considered to be the most effective to ensure the relevance of the topics covered and to contribute to their wider dissemination and sustainability. The UADY, with the support and guidance of the PMU, will also promote, results from other Activities developed/executed by the Project, contributing to raise awareness and promote linkages to, for example, Activities related to systems being developed to alert the population to pollution peaks and events

such as harmful algal blooms, and events associated to climate change and sea level rise (Component 1 Environmental Monitoring Programme), as well as to Component 2, in particular activities in support of the strengthened role of women in the community, development of co-management strategies, certification schemes (ecolabeling), and integral community-based ecotourism projects.

These cross linkages will also support the longer term sustainability of the SAP Implementation Project which will in addition also build on the results and continued successes of the SAP Development Project. For example, the Network of Wetland Restoration Communities has organized workshops to facilitate information exchange and cross-fertilization and held, in November of 2015 the 4th Meeting of Wetlands Restoration Communities. The stated objective of this meeting was to strengthen the capacities of the members of the network for conservation, restoration and sustainable use of the wetlands ecosystems of the Gulf of Mexico and the Caribbean. The government, to mainstream results from previously cofinanced activities, in support of improved policies, and wider civil society involvement, facilitates these interventions through the National Watershed Councils (http://consejocuencatuxpanjamapa.org).

The education programs will be delivered by UADY (who will provide a daily allwance to participants) through 3, 1-day workshops in each of the 6 communities (for a total of 18 workshops for a minimum of 30 participants each), starting with the two sites from the Terminos Lagoon area. The first of these 3 workshops will target previously sensitized members of the communities (people that participated in the surveys and solid waste diagnostics) and will take place as soon as reasonably possible after the Community Profile activities, ensuring a high level of interest is maintained. Results from these first two workshops will be used by the UADY to adjust materials as/if pertinent, prior to their replication in the other 4 communities.

These first workshops for previously sensitized participants will be followed by workshops for the other target audiences (women's groups, teachers and school children; and, municipal authorities and community interest groups). It is expected that through these activities, approximately 540 participants will be reached.

In support of these activities, and taking into account results (if applicable) from other Activities being executed under this Project, the UADY will prepare and produce awareness raising materials for a broad non-specialized audience, including leaflets, posters, brochures, etc., which will be used in support of the widest possible dissemination of information and of results of the Project's interventions (success stories) to communities in the coastal states of the GoM.

Finally, during years 4 and 5 of the project, the UADY will design and apply surveys in the same communities to evaluate and assess behavioural changes. This will take the form of a one-day workshop for groups of a minimum of 30 participants, selected randomly among the population and supported to participate (daily allowance). The results will be presented in a report to the PMU, and will include recommendations for future actions, which could be undertaken by the government in support of coastal communities.

A series of changes with long lasting positive results for the ecosystem are expected from these interventions. For example, the introduction of best practices on generation and management of solid waste and wastewater will have a direct effect on the amount of nutrients released and reaching—direct or indirectly—the mangroves. The reduction of the pollutant load of an estimated 30% will contribute to the accelerated recovery of the wetlands and mangroves, and of the life systems it supports. As is described below, the restoration efforts will also result in measurable carbon sequestration, water quality improvement, as well as improved hydrological and biological connectivity. Finally, the results are also expected to support and/or trigger the development of public policies in support of continued intervention.

Output 3.2 - Community based wetland restoration in selected sites

Community-based programs will be developed to facilitate the replication and up-scaling of mangrove restoration activities successfully launched under the SAP Development Project. The principal objective is to restore coastal ecosystems and prevent the introduction of invasive non-endemic species in a minimum of six sites. These activities will rely on the development and implementation of education programs targeting the local population and will be followed by practical on the ground trainings and demonstrations. With the

appropriate training and equipment, potential community leaders, women and men with and improved sense of self-esteem, can rise to address new challenges. This in turn will help to reproduce successful experiences to cope with growing restoration needs, as other communities voluntarily join the project, in support of a sustainable virtuous cycle (J. Lopez-Portillo, 2015).

The GoM SAP Development Project successfully demonstrated the importance of involving the local population, specifically women, in the preservation and restoration of the environment. Women were more implicated than men during the initial phases of the project and their involvement in restoration-associated tasks and on everyday logistics was spearheaded/facilitated. It is noteworthy that the money earned by these women (as part of government incentive programs) was used to improve housing conditions, to cover children´s education expenses, and to diversify sources of income through development of alternative activities (such as trade and, preparation of food on more fuel efficient cook stoves). Women also started working in fish processing cooperatives and are reportedly, currently still employed. As a result, their status within the family nucleus changed from one of total dependence to one of provider, contributing with an important source of income. This has contributed to empowering women to make their own decisions within the family and community.

This Output will build on these lessons and will seek to strengthen the role of women relying on the sustainable management of coastal and marine resources, in support of their decision-making abilities and the development of their productive activities. This approach will reinforce the intrinsic link of the communities with their environment, and will also help to permanently introduce the concept of ownership. Involving the vulnerable and marginalized population sectors whose livelihood depends on costal and marine ecosystems has already proved to be a particularly important element of success and will also be pursued in this Project. This will ultimately impact community supported conservation of mangroves and other wetlands—contributing to rehabilitation and conservation of mangrove forests, carbon (re)capture, water quality, and habitat recovery—in support of the increase of local fish populations and subsequent increase of fisheries, and adaptation to climate change.

Given its expertise in the inclusive rehabilitation of coastal wetlands through involvement of local communities at all stages of the restoration process, the Executing Agency selected for the delivery of this Output will be the Institute of Ecology, A.C. (INECOL) a Federal Public Research Center. INECOL is a public strategic research institute that leads scientific technology development, social development, and natural heritage conservation supporting research in ecology and biodiversity. INECOL was formally created August 7, 1975 and was the first institute in the country to focus on Ecology. Through applied research, INECOL's mission is to generate knowledge about Mexico's ecosystems to support management and resource protection. INECOL's objectives are to: produce high-quality science, prepare high quality professionals, to strengthen ties with the both the public and private sectors, and work in preservation of both natural and biological heritage. The INECOL will rely on previously developed capacities (communities having participated in mangrove restoration efforts), on the successful results obtained during the GoM SAP Development Project (in particular the pilot project on mangrove restoration) and has also committed to explore and integrate into its deliverables potential synergies with activities being executed in parallel under other Components of this Project.

3.2.1 – Validation of restoration sites

The INECOL will validate the preliminary report listing potential restoration areas, which it will assess and rank based on a suite of criteria (see below). The report will be delivered to the PMU and the final selection of six (plus two back-ups) sites will be validated in coordination with SEMARNAT. The INECOL with the support of the PMU will then verify candidate communities on these areas whom, upon selection will be visited to confirm that pre-conditions are in place to ensure the highest likelihood of long-term success. The objective is to select a minimum of 6 sites and 6 leading communities on these for the restoration activities. Further to this, a synthesis report documenting the selection process will be presented to the PMU.

The validation of candidate restoration sites will be based on the further refinement of the suite of criteria used for their preselection during the PPG Phase. This will be prepared by the INECOL, and the final selection will be agreed upon with the PMU. For the selection of sites the INECOL will review information available from different sources, including but not limited to results of the GoM-LME SAP Development Project, academia and public databases (SEMARNAT, CONANP, CONAFOR, INEGI, etc.) and will contact as/if necessary relevant state and municipal government offices. The selection criteria will include general watershed information (including main stakeholders involved) and the protection status of the sites being considered, as is shown in tables 1 and 2 below, and figure 1. The foreseen result of the project is to restore 3,000 ha of mangrove and other wetlands, as detailed below, and this will impact the ecosystem in multiple ways:

Table 1 – General Information, per watershed

Watershed	State	Site	Locality	Wetland area to be restored (ha)	Stakeholders
Tamiahua	Veracruz	Tamiahua	Ejido colonia la Reforma	366	Fundación Pedro y Elena Hernández, A.C., Colonia Ejidal la Reforma, INECOL, CONANP, CONAFOR, UNAM, UAM.
Pánuco	Veracruz	Tecolutla	South of Tecolutla estuary	530	ONG Salvemos los Humedales de Tecolutla, UV, INECOL, PRONATURA, CICIMAR, UAM, CONAFOR.
Papaloapan	Veracruz	Sistema Lagunar Alvarado	Alvarado	231	PRONATURA-Veracruz, INECOL, CONANP, UV, CONAFOR, UNAM, Ejidos el Vitillo and Costa de San Juan
	Veracruz	Sontecomapan	Costa Norte	125	ONG Comunidad de Restauradores de Sontecomapan, INECOL, UV, PRONATURA, CONANP, UNAM, CONAFOR.
Usumacinta	Campeche	Atasta Norte	Atasta	250	ONG Mujeres Ejidatarias Artesana, CONANP, UNACAR, PEMEX, EPOMEX, UJAT, ECOSUR, UAM, SEMAR, CONAFOR.
	Campeche	Isla del Carmen	Bahamitas	1471	ONG Comunidad de Restauradores de Isla Aguada, UNACAR, CONANP, SEMAR, PEMEX, EPOMEX, UNAM, CONAFOR
Potential area to be restored (ha)				**3000**	

Table 2 - Protection status

Site	Priority Land Region (CONABIO)	Priority Marine Region (CONABIO)	Priority Hydrological Region (CONABIO)	Important Bird and Biodiversity Areas (IBAs)	Wetland of International Importance (Ramsar)	Mangrove site of biological relevance and ecological rehabilitation needs (CONABIO)	Protected area of Flora and Fauna (CONANP)
Tamiahua	No. 103	No. 47	-	-	No. 1596	-	-
Tecolutla	-	No. 48	No. 76	No. 151 (AICA SE-04)	-	No. GM55	-
Sistema Lagunar Alvarado	No. 124	No. 50	No. 79	No. 41 (AICA C-50)	No. 1355	No. GM53	-
Sontecomapan	No. 131	No. 51	No. 80	No. 151 (AICA SE-04)	No. 1342	No. GM54	Biosphere Reserve
Atasta	No. 144	No. 53	No. 90	No. 156 (AICA SE-10)	No. 1356	No. PY57	MEX - 15
Isla del Carmen	No. 144	No. 53	No. 90	No. 170 (AICA SE-25)	No. 1356	No. PY63	MEX - 15

The criteria for selection of potential areas to be restored will also include subareas, to establish connectivity among presently disconnected coastal water bodies and decrease hypersalinity, opening migration paths for propagules from healthy wetland ecosystems, and to facilitate regeneration. It is important to consider that total area to be restored does not necessarily imply that all the area must be occupied by mangroves, given other ecosystems, such as water bodies and natural channels are also important to connect semi terrestrial and aquatic habitats.

The selection of communities will be based on a suite of criteria including for example, existence of organized or semi-organized communities and other stakeholders (CSOs, NGOs, academic institutions, etc.), previous experience with mangrove restoration, expressed interest and support of Federal and State authorities, etc. Once selected by the INECOL, this list will be presented, for validation, to the PMU. Amongst these The selection of communities is considered essential for the success of the restoration interventions, a case in point being the on-going activities of community groups whose capacities were strengthened during the GoM SAP Development Project. A case in point being the *Mangrove Ecosystem Conservation and Restoration Community Group* (Comunidad de restauradores del manglar de Isla Aguada S.C. de R.L. de C.V[47].) which was formed between the communities of Bahamitas, Isla del Carmen, and those from the Laguna de Terminos Flora and Fauna Protection Area (Campeche), to work towards the restoration and conservation of mangroves. This Community Group has participated in environmental education workshops, hydrological rehabilitation through canal dredging, collection and planting of mangrove propagules, establishment of environmental monitoring stations, and installation of pressure sensors for monitoring flooding levels (Zaldívar *et al*, 2013). In addition the members of these communities are first hand witnesses of the benefits generated by sustainable environmental practices and have de facto become its persuasive ambassadors; when approached by members of neighbouring communities, knowledge and information is openly and proudly shared (Mid Term and Final Evaluations, GoM-LME Pilot Project - UNIDO 2012-2014).

Upon selection of the sites, the INECOL with the support of its habitat quality assessment experts, and in consultation with CONANP will organize and conduct field visits to each of the 6 sites (involving representative members of the communities) to characterize the selected wetland environments based on their geomorphologic setting, measurement (one-time) of soil and interstitial waters (salinity, redox potential, pH, temperature, etc.) and vegetation structure (basal diameter, height, cover, species composition). Forensic Ecology methods applied to explore and understand the causes of degradation will be used to test the viability of restoration actions proposed and adjust these accordingly. Evidence of deteriorated mangroves will be sought and measured (existence of snags or dead trunks in trees or patches of dead vegetation in herb-dominated wetlands).

The results will be collated and synthetized and will be presented in the Site Specific Baseline Reports and Restoration Proposals for mangrove restoration activities for each of the 6 areas. The INECOL, with the support of the PMU who will facilitate access to lists of participants from previous restoration efforts, will also identify representatives of the communities who will participate in Coordinating Technical Groups in all 6 restoration sites, to facilitate the preparation, revision and definition of agreements, calendars of activities and expected advances, as well as to define potential co-financing institutions.

Meetings (one per site to be restored) of the Coordinating Technical Groups with stakeholders of each of the target restoration sites (including local community leaders and authorities – ejido (communal lands) and small property owners) will be organized and consensus building activities will be supported to determine user perceptions and target goals, as well as to establish accessibility, land ownership, social-economic and political viability of the restoration efforts.

[47] Sociedad Civil de Responsabilidad Limitada de Capital Variable - Variable Capital Limited Liability Company

The INECOL will prepare 6 meeting specific reports including documentation of agreements, obligations and responsibilities of stakeholders as well as co-financing requirements. The INECOL will then develop with the support of CONANP, 6 action plans to mobilize additional financing, in support of restoration activities, including the preparation of 6 specific projects for review and approval by the identified co-financing institutions.

This activity is considered of importance as CONANP has access to financial resources from a number of sources including Procodes (Programa de Conservación para el Desarrollo Sostenible), Procer (Programa de Especies Prioritarias de Conservación), and can also access other institutions such as CONAFOR, the Federal Delegation of SEMARNAT and its Department of Special Projects and Environmental Compensation and the Temporary Employment Program, the Environmental Impact and Federal Zone department, etc.

The support from the GEF will allow the project to build on and replicate the positive initial results obtained during the TDA Development Project; it is expected that this will facilitate mobilization of complementary funding, in support of these activities.

Mangrove restoration site - Bahamitas, Mexico. At start of SAP Development Project (2011, on the left) and April 2016
Credit A. Zaldivar-Jimenez

3.2.2 - Develop community leadership/ownership

The INECOL will organize one 3-day workshop in each of the 6 selected communities, and support a minimum of 20 participants each (daily allowance), to introduce specific restoration programmes and techniques for mangroves and other wetlands (based on the Site Specific Baseline Report and Restoration Proposal developed under the previous Activity). Relevant training materials will be prepared by the INECOL and distributed to participants. The workshops will provide an opportunity to verify leaders in the communities (women and men) that could mobilize the brigades of wetland restorers required to ensure the success of these initiatives.

These workshops will explain and address site-specific challenges and will also introduce alternative economic activities to complement fishing, which could be adapted to the community. Examples will be provided by INECOL to demonstrate the fact that the rehabilitation of natural waterways connecting internal lagoons, freshwater wetlands and marshes, must be a priority not only due to the recovery of wetland ecosystemic functions, but because it promotes employment in the communities and improves local economies (through ecotourism-related activities such as sports fishing, boat sightseeing, walkways with educational signage, and bird watching).

Each workshop will include in situ field training, evaluation of current environmental restoration activities, and site-specific demonstration of methods to prevent or mitigate degradation of coastal habitats. These restoration-related activities will also include awareness raising activities in promotion of cross-linkages to other Activities developed under the Project including techniques on domestic wastewater and solid waste reduction management and fisheries related capacity building, being introduced under Outputs 3.1 (community education), and 2.4 (small scale fisheries).

The workshops will also build on the results of the GoM SAP Development Project pilot study, and representatives from the *Mangrove Ecosystem Conservation and Restoration Community Group* will be invited to participate and share results and success stories. This exchange will contribute to raising the awareness of the communities and showcase capacities and resulting opportunities for the conservation and restoration of mangroves and other wetlands.

The workshops will finally also address the control of native and exotic invasive species, such as German grass (*Echinochloa polystachya*) introduced as livestock forage, Australian Pine (*Casuarina equisetifolia*) and the native mangrove ferns (*Achrostichum aureum* and *A. danaefolium*), which may arrest regeneration after events such as hurricanes, floods and clear cuts. This is in line with the objectives the GEF-funded project on Enhancing National Capacities to Manage Invasive Alien Species as well as with Mexico´s National Strategy for Invasive Species to apply policies and best practices for managing invasive species.

Building on previous results and experience in similar localities being restored, an online Course on Mangrove Ecological Restoration and Forestry Management was designed by Pronatura-Veracruz, INECOL, the Ag-Science Postgraduate College (Colegio de Postgraduados en Ciencias Agrícolas - COLPOS) and NatureServe and was rolled out in the second quarter of 2015. This course (http://pronaturaveracruz.org/cursos/) was developed for community leaders, technicians, decision-makers and officials involved with mangrove ecosystems in the GoM (CONANP, CONAFOR, SEMARNAT, academic institutions and NGO´s) and relies on a distance education platform and on field practices. The course contains five modules that provide theoretical and technical knowledge about mangroves and their use and its main objective is to enhance the technical abilities for community-based organization and management to increase the probability of success in restoration projects.

The course will be adapted by the INECOL, under supervision of CONANP to meet the needs of the selected sites for community-based wetland restoration. This course will also address the training needs identified for Component 2 (fisheries) for which co-financing from INECOL (in-kind) will be made available to redesign the course to cover not only wetlands, but small-scale fisheries as well.

3.2.3 - Implement restoration programmes

The pilot project launched under the GoM SAP Development Project successfully developed a scalable methodology to restore the functionality of mangrove ecosystems through hydrologic restoration processes and demonstrated that this approach is more profitable than the equivalent investment in nursery plants. Based on this methodology, the INECOL will develop community specific wetland restoration Programmes for the 6 communities.

GIS maps of the 6 selected sites will be prepared by the INECOL and field validation will pinpoint the degraded mangrove sites as well as their natural reference sites. The thematic maps will show vegetation and water body cover, mangrove communities in each site, and their health condition. Once the likely causes of degradation have been confirmed (see above, Site Specific Baseline Report), the appropriate activities for ecological restoration will be developed by INECOL and will be presented in community specific restoration Programmes. These will contain clear plans and timelines to execute the restoration activities, data collection and quality control. Based on these, information bulletins, posters, leaflets in printed and digital formats will be prepared by the INECOL to disseminate the results to as wide an audience as possible.

The Programmes will be presented in detail to each of the communities through a 3-day inception workshop for a minimum of 30 supported participants (daily allowance) and executed. The participants previously

trained during the field visits, will be invited to the inception workshop by the INECOL and will review and approve the proposed execution plan. Further to this, the members of the restoration teams will be organized by the community leaders into brigades, equipped and coached by INECOL (boots, gloves, shovels) and deployed in the field to carry out the restoration activities, and monitor restoration progress. Based on the GIS maps previously prepared, the INECOL will prepare local maps for the restoration teams that group leaders and members of the brigades will use to assign specific tasks and to program daily goals. Progress will be monitored on a six-monthly basis by the INECOL and reports and maps documenting this will be presented to the PMU.

The impact of these restoration activities is expected to be significant, quantifiable and measurable. The time series maps generated by the INECOL will support, for example, the measurement of the resulting carbon sequestration, taking into consideration the fact that "mangrove restoration is an efficient strategy to capture carbon from the atmosphere, at a relatively low price" (Siikamäki et al. 2013[48]).

Output 3.3 - Improved coordination and bilateral cooperation through strengthening of networks

Management of the resources of a large marine ecosystem such as the GoM cannot be sustainably achieved without effective governance mechanisms supported by the countries delineating its borders. Although both Mexico and the United States can refer to numerous governance mechanisms[49] that are in place (legal, institutional, planning and policy, awareness, public participation, to name a few), in order for these to address the multiple shared marine and coastal environment related issues effectively - on a regional scale - coordination mechanisms need to be strengthened, or put in place. Scientific information and education capacities generated from resulting mechanisms that will either be strengthened or established will support informed decision making processes.

To facilitate the establishment or strengthening of these types of collaborative mechanisms, the PMU will select representatives from Mexico and the United States that will provide guidance and oversee a review of existing agreements, and of the institutional capacity to support them. The group of identified experts will validate collaborative opportunities identified and provide recommendations to guide the interventions that will be put in place and supported by the PMU.

3.3.1 - Institutions mapped and opportunities for integration identified

In consultation with the U.S. NOAA, the project will support SEMARNAT and SEMAR, which is the lead for the Inter-Ministerial Committee for the Integrated Management of Oceans and Coasts (Comisión Intersecretarial para el Manejo Sustentable de Mares y Costas - CIMARES), to nominate 5 representatives from each Mexico and the United States who will be invited and supported (travel, daily allowance) to participate in a 4-day meeting in Mexico. This Bilateral Coordination Group (BCG) will be convened during the first year of the Project.

The 10 members of the BCG will be appointed by the two countries and will include for example representatives from NOAA, and GoMA from the United States, and from CIMARES, CONACIO, the GoM, Sea-Use-Planning Committee (GoMSUPC), INAPESCA, CONAPESCA, SEMARNAT, etc., in Mexico. Participation in the BCG will be open to officials from other Mexican and U.S. government agencies. During the course of the Project's life, it is expected that the PMU will call on the BCG to provide specific advice and

[48] Siikamäki J, Sanchirico JN, Jardine S, McLaughlin D, Morris D 2013 Blue Carbon: Coastal Ecosystems, Their Carbon Storage, and Potential for Reducing Emissions. Environment: Science and Policy for Sustainable Development. 55(6): 14-29

[49] Díaz-de-León and Díaz-Mondragón, 2013; Azuz-Adeath et al, 2014 and Acevedo García, 2015

guidance, and in this context, up to one meeting per year could be organized and supported (depending on availability of funds).

In the course of the first year, the BCG will oversee and guide a review process that will be launched by the PMU. Guidance from the BCG will be sought to finalize the terms of reference scoping out the work of an international expert tasked with the review of existing agreements in place between the two countries, as well as of the existing institutional capacity in place to support their execution. The review of agreements will include, but not be limited to:

- Ocean Policies, Marine Spatial Planning processes, MoUs (SEMARNAT/EPA, NOAA/INAPESCA-CONAPESCA, etc.);
- The United Nations Convention on the Law of the Sea (UNCLOS);
- The International Maritime Organization (IMO), International Oceanographic Committee (IOC), Cartagena Convention and its protocols (including land base sources of pollution);
- The Ramsar Convention (wetlands);
- The AICHI Targets derived from the Biodiversity Convention; and,
- The Sustainable Development Objectives of United Nations.

The BCG will review the draft report and will provide comments to the international expert prior to finalization. The final report will include an assessment of gaps, and of potential opportunities for collaboration, which will be identified and ranked, in terms of their relevance and contribution to the overarching objectives of the Project (improved water quality, recovery of living marine ecosystems and restoration of coastal ecosystems).

This report will form the basis for the discussions during the 4-day meeting of the BCG, the objective of which will be to review, select and prioritize identified opportunities, for action by the PMU. Although this does not preclude any of the results stemming from the report, or from the meeting of the BCG, the following are considered to be potential win-win situations that the BCG might wish to recommend for further action, to the PMU:

- Strengthening collaborative opportunities between the U.S. GOMA and the GoMSUPC (which includes representation from 6 Mexican states);
- Strengthening networking by supporting/facilitating linkages with the GOMA Education WorkGroup, to enhance dialogue and exchange of experiences with the existing Mexican Alliance. This Alliance was created by the GoM LME pilot project;
- Strengthening collaborative opportunities between the Consortium of Marine Research Institutions of the GoM and Caribbean (CIIMAR-GOMC – Consorcio de Instituciones de Investigacion Marina del GoM y del Caribe) and the GOMURC;
- Strengthening exchange of information relative to best practices for the generation of coastal and ocean health, and coastal and marine human impacts indexes;
- Strengthening exchange of information relative to best practices in spatial planning.

These recommendations would be prioritized and acted on by the PMU (as funds permit) who could for example support the identified institutions, through a series of meetings (travel and daily allowance), to explore collaborative opportunities and select education and research priorities.

It is also expected that the BCG will during this process also provide guidance to the PMU to:

- Define overarching priority issues (invasives, hypoxia, etc.) to be addressed and provide guidance on initial steps required;
- Define priority mechanisms to strengthen inter-institutional coordination, and bi-lateral collaborative partnerships;
- Prioritize capacity building activities and preparation of awareness raising materials to be developed by the PMU, in support of strengthened integration.

3.3.2 - Develop/implement proposals in support of the enhancement of governance capabilities and transformational opportunities

The PMU will develop proposals in support of the relisation of as many transformational opportunities for governance, identified under the previous activity, as permitted by the available funds. This will be done in coordination with the BCG and in consultation with CIMARES, CONACIO and the GoMSUP, and NOAA.

To support the execution and ensure fruition of these opportunities, the PMU will, amongst others consider: the need/pertinence of commissioning in depth analysis reports of the selected opportunities (with the support of national and/or international experts); Preparation of awareness raising materials; organization of meetings to support linkages between institutions, etc.

Through this activity, it is expected that governance capabilities of CIMARES, CONACIO, GoMSUP and CIIMARGOM will be enhanced, and that good practices (GOMA, GOMURC), will be emulated, in support of the integrated management of the GoM.

Output 3.4 - Support effectiveness of Marine Protected Areas by linking them into networks

Marine Protected Areas, or as they are referred to in Mexico, Natural Protected Areas (NPAs), are of vital importance for maintaining biological and cultural diversity and provide important goods and services for the welfare of Mexicans. In light of this, NPAs are considered a high priority in Mexico's Natural Protected Areas Programme (2013-2019). NPAs are recognized under different international agreements and programs including the Wetlands Convention (RAMSAR), UN World Natural Heritage, Man and the Biosphere (UNESCO), UN Sustainable Development Goals (SDG) and the Aichi Biodiversity Targets (Biodiversity Convention).

SDGs recognize NPAs as an important management instrument to "Conserve and sustainably use the oceans, seas and marine resources" (Goal 14), while Aichi establishes an important target specifically for NPAs stating that: "B 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes".

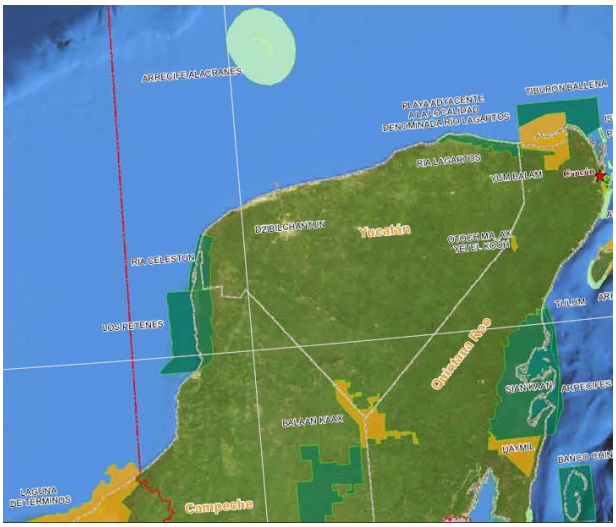
NPAs are created in Mexico by Presidential Decree and play an important role in the federal strategies and action lines included in the National Development Plan, in the Sectorial Environmental Program and in the National Natural Protected Areas Program of Mexico for 2013-2019. The coastal and Marine Mexican NPAs of the Gulf of Mexico are:

- Flora and Fauna Protection Area of Laguna Madre
- Sanctuary Rancho Nuevo
- Flora and Fauna Protection Area of Sistema Arrecifal Lobos-Tuxpan
- National Part of Sistema Arrecifal Veracruzano
- Biosphere Reserve of Los Tuxtlas
- Biosphere Reserve Pantanos de Centla
- Flora and Fauna Protection Area of Laguna de Términos
- National Park of Arrecife Alacranes
- Biosphere Reserve of Los Petenes
- Biosphere Reserve of Ría Celestún
- Biosphere Reserve of Ría Lagartos
- Flora and Fauna Protection Area of Yumbalán- Biosphere Reserve of Tiburón Ballena.

With the exception of Arrecifes de Veracruz for which a Decree is ready but has not been promulgated, and Rancho Nuevo, all others have been declared NPAs by Decree, and have established Management

Programs (MPs). The MPs aim to promote conservation activities and in general include six priority subprograms (Protection, Management, Restoration, Research, Culture, and Administration) defining objectives, goals and specific actions.

NPAs of the Coastal Plains of the Gulf of Mexico



NPAs of the Yucatán Peninsula

A Memorandum of Understanding (MoU) already exists and was signed between SEMARNAT's CONANP and NOAA's National Marine Sanctuaries (NMS) on Marine NPAs. This MoU confirms the commitment of Mexico and the United States to collaborate in the support of the integrated management of the Gulf of Mexico NPAs. The working program draft (part of the MoU) has been elaborated by CONANP and NMS and covers the following NPAs:

For Mexico:

- National Park of Arrecife Alacranes;
- Flora and Fauna Protection Area of the Sistema Arrecifal Lobos Tuxpan;
- National Park of the Sistema Arrecifal Veracruzano;
- Flora and Fauna Protection Area of the Yum Balam-Biosphere Reserve of Tiburón Ballena;

- National Park of Isla Contoy;
- National Park of Costa Occidental de Isla Mujeres, Punta Cancún y Punta Nizuc.
- Although the latter 3 are not part of the GoM area project, they have already been included in the working program draft between CONANP and NOAA-Sanctuaries.

For the US, NPAs included are:

- The Flower Garden Banks National Marine Sanctuary; and,
- The Florida Keys National Marine Sanctuary.

It is important to note that a mechanism such as this one provides a strategic advantage in terms of collaboration; as a first step, a process of twinning between NPAs will generate an effective, adaptive and integrated management of the coastal and marine zones, which, in a second stage will support the establishment of a network of marine protected areas covered by public policies to promote the protection and sustainable use of natural resources from an economic, touristic and food security perspective.

Mexico is also currently collaborating with the IUCN on the adaptation and implementation of its “Green List” of criteria for the adequate management of NPAs. These criteria could be converted into indicators to assess the degree of progress in the conservation and management of marine and coastal resources, as well as of the performance of the network of NPAs.

3.4.1 - Verify/select transformational opportunities to capitalize on existing strengths in MPA networks

In order to facilitate the engagement and participation of NPA managers from both countries, CONANP and NMS will designate focal points to conform a Working Group (WG) that will meet once a year, on a rotating basis in United States and Mexico, for the duration of the Project. The WG will prepare meeting reports and will deliver these to the PMU after each of its meetings. The WG will prepare the agendas, coordinate and facilitate yearly thematic workshops for 20 participants, which will be organized and supported by the PMU (travel, daily allowance) and which will take place, back-to-back with the yearly meetings of the WG. These workshops will include participants from regional academic institutions, civil society organizations and other relevant stakeholders.

It is expected that generating and/or strengthening technical capacity and technology exchange between the two countries will lead to the development of strategies and implementation of specific actions to assist in the process of adaptation of coastal, marine and reef systems to the effects of Climate Change as well as to the pressures of coastal development. Ultimately, the definition of public policies for the protection of mangroves, reefs and sea grasses, the development of blue carbon mechanisms, integrated coastal management and establishing criteria for wastewater treatment in karst and reef ecosystems are some of the topics to be developed under this project.

Topics of the workshops will be chosen by the WG, in consultation with the PMU and could include, *inter alia*:

- Reef and other important ecosystems and species health conditions and threats (including bleaching);
- Water quality monitoring, management (restoration, uses, concessions, permits, monitoring, carrying capacity and acceptable limits for tourism, conflict resolution);
- Effectiveness of management plans, legal mechanisms;
- MPA planning (including the GoM Sea use Planning and, the Climate Change Strategy for MPAs (Estrategia de Cambio Climatico para Areas Protegidas ECCAP, 2015-2020).

Although both countries have advanced on these topics, new proposals are needed to address the GoM in an integral manner and in depth discussions and agreements on these topics will provide strong support in this direction. The workshops will be designed to support sharing of information and experiences between

both countries and will determine potential actions and recommendations, which could be presented for consideration of the relevant authorities by the PMU. These could include modifications to Decrees, management plans and/or legal bases of NPAs, etc.

The Workshop results will be documented and reports will be prepared by the PMU after each of these. The recommendations contained in these reports will feed directly into the following and last Activity of the Project, aiming to strengthen the Management Programs of NPAs.

Mexico is in the process of conducting "scorecard" evaluations of its network of marine NPAs. These evaluations combined with the workshops detailed above will eventually provide information necessary to document positive environmental effects stemming from reduced pollutant emissions into the Gulf.

3.4.2 - Develop/implement actions in support of selected MPAs

Mexico's General Law of Ecological Equilibrium and Protection of the Environment (Ley general de Equilibrio Ecologico y Proteccion al Ambiente - LGEEPA) stipulates that NPAs must develop and implement a Management Program (MP). This is the planning and regulation instrument that guides management and administration decisions, and sets the uses, activities, strategies, actions and guidelines for their management. MPs give certainty both to the authorities and the users of MPAs, by defining authorized and prohibited uses.

MPs are of direct relevance for the objectives of the SAP Implementation Project. For example, the MP for the Flora and Fauna Protection Area of Laguna de Términos includes the following actions lines:

- Inventory of pollution sources caused by human activities;
- Analysis of the influence of human activities in the high watershed of Rio Usumacinta and the surrounding area of the coastal ecosystem;
- Development of biotic indexes on the integrity of ecosystems.
- The MP also includes criteria for uses of the NPA, such as Agriculture and Cattle Ranching, prohibiting for example pollution of water bodies by nitrates and phosphates.

The MP of the Flora and Fauna Protection Area of the Lobos-Tuxpan Reef System provides another example of these strong linkages. This MP supports efforts to guarantee provision of adequate space for the recovery of the populations of flora and fauna. The MP delimitates the areas and activities that can be developed without affecting the reef ecosystem, and promotes actions for conservation, restoration and uses through strategies, actions, criteria and other guidelines. This MP includes a component and a sub-program for the management and sustainable use of fisheries and reefs and actions seeking to:

- Promote workshops on sustainable fisheries for the fisherfolks of the NPA and its influence zone, with support of governmental institutions, academia and universities and civil society;
- Promote the interchange of experiences between fishers of the NPA with other fishers that use the resources sustainably;
- Promote temporal exclusion zones with the consensus of the fishers for marine species reservoirs;
- Procure financial resources to support sustainable and productive projects.
- The above provide clear examples of the importance of supporting development and strengthening of the Management Programmes of the GoM-LME Marine Protected Areas. These MPs can, simply stated, have a direct impact on the objectives of the SAP Implementation Project, in particular as regards water quality, recovery of living marine resources and coastal ecosystem restoration.

In order to strengthen these Management Programs, and learn from the experiences and results from the development and implementation of similar MP in the United States, the Project under this final Activity will support the evaluation of 2 MPs.

CONANP through Mexican scientists appointed to the WG, in consultation with the MPA councils of the established NPAs, and taking into account best practices identified through the workshops conducted by the WG under activity 3.4.1 above, will select two representative MPs for evaluation.

The Project, through the PMU will support (travel and daily allowance) two, five-day meetings of the WG that will take place in the NPAs selected for evaluation. The WG will be responsible for preparation of reports assessing the effectiveness of the MPs, analysing gaps and proposing recommendations, which will be delivered to CONANP and the PMU for review. In its review and in support of cross linkages, the PMU will ensure that results and lessons learned from the execution of other related Project Activities are reflected and/or considered.

CONANP (as part of its in-kind co-financing) will be responsible for the overall evaluation of the compliance of strategies, action lines and other guidelines, as well as their effectiveness and contribution to the objectives, targets and/or goals of selected MPs. The final report prepared by CONANP will include crosscutting recommendations that will be of relevance and applicable to NPAs in general, but will also include specific recommendations for Mexican ones.

CONANP, with the support of the PMU will present and validate the reports and recommendations with relevant authorities, during a one-day meeting. Participants will include but will not be limited to SEMARNAT, CONANP, INAPESCA, CONAPESCA, as recommendations could be of relevance, if realized.

The PMU will prepare a report further to this meeting and will document and follow up, on a six-monthly basis, on progress regarding adoption and realization of any of the recommendations.

Component 4: Monitoring, Evaluation and, Dissemination of Results

Effective monitoring and evaluation is a major tool in project management. The monitoring program will consider bi-national agreements, protocols and, international standards, to collect analyze and process the data to be incorporated into a web-based information system. The program will include periodic progress reports on the impact status in the region, for each of the components of the project.

Project monitoring and evaluation (M&E) will be conducted in accordance with established UNIDO and GEF procedures. UNIDO as the Implementing Agency will involve the GEF Operational Focal Point and project stakeholders at all stages of the project monitoring and evaluation activities in order to ensure the use of the evaluation results for further planning and implementation.

Monitoring will be based on indicators defined in the strategic results framework (which details the means of verification), and the annual work plans (AWP). Monitoring and Evaluation will make use of the GEF Tracking Tool, which will be submitted to the GEF Secretariat three times during the duration of the project: at CEO Endorsement, at mid-term review, and at project closure.

The Project Management Unit (PMU) will prepare short quarterly activity reports and semi-annual and annual reports (see details below) reviewing progress/results of each of the project Components. These documents/reports will provide the basis for the discussions/reviews of the Steering Committee, and feed into the mid-term and final evaluations.

According to the Monitoring and Evaluation policy of the GEF and UNIDO, follow-up studies such as Country portfolio evaluations and thematic evaluations can be initiated and conducted. All project partners and contractors are obliged to (i) make available studies, provide reports or other documentation related to the project and (ii) facilitate interviews with staff involved in the project activities.

Independent Evaluation

In accordance with UNIDO's Evaluation procedures, the project will be subjected to two independent external evaluations as follows:

Midterm Review: An independent Mid-Term Review (MTR) will be undertaken during the third year of implementation of the Project. The MTR will determine progress being made towards the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term review will be prepared by the Project Manager (UNIDO), with support from ODG/EVA (Office of the Director General, Evaluation Unit), and will be validated with the Projects Focal Points in Mexico and the United States

Final Evaluation: A Final Independent Evaluation (FIE) will take place three months prior to the Final Project Steering Committee Meeting, and will build or results of the mid-term review. The FIE will also look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The FIE will also provide recommendations for follow-up activities. The Terms of Reference for this evaluation will be prepared by the Project Manager (UNIDO) with support from ODG/EVA.

Dissemination of results

Results from the project will be centralized and filed by the PMU, and will be disseminated as widely as possible, within and beyond the project intervention area, using no-cost/very low cost information dissemination networks (electronic and/or paper) and fora. In addition high visibility opportunities will be

sought to showcase project results by participating in scientific, policy-based and/or any other relevant events (national or international).

The PMU will proactively seek opportunities to share lessons learned that might be beneficial in the design and implementation of similar ongoing projects and/or activities and will also seek to identify relevant lessons learned by similar projects in order to integrate them and improve delivery of results.

4. Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF and co-financing

Overall, the GEF's intervention will trigger SAP implementation and the up scaling of key developments initiated during the SAP Development Project that address transboundary priority issues such overexploitation of fishery stocks, pollution and hypoxic zones. With the GEF's intervention, main transboundary environmental issues and their long-term socio-economic consequences can be addressed in a way that strengthens coherence among the existing governance mechanisms in the two countries and facilitates the transformation of current human activities and practices in different sectors at regional level.

With the GEF's support, the National Cleaner Production Center-Tabasco Unit (NCPC-TU) will provide technical assistance by introducing TEST methodologies to relevant sectors in Mexico. The pilot sectors can demonstrate how to increase their profits by improving resource efficiency through the adoption of clean technologies and/or best environmental practices, while at the same time reducing their environmental impact. Through sharing experiences with non-pilot sectors, the GEF's assistance can assist Mexico in developing green industries. In addition, the Environmental Monitoring and Assessment practices implemented by the project can serve as the criteria relevant to tropical ecosystems. The effects of GEF's interventions will provide cross-fertilization opportunities and build synergies with other regional or global projects/programs.

In terms of rebuilding the depleted target fish stocks, a business-as-usual scenario would mean that insufficient action is taken to protect living marine resources and that both countries could risk to incur significant economic and ecological losses, in particular, in industrial and small-scale fisheries, and recreational fisheries. Development of ecotourism as promoted by the project will put in place opportunities for sustainable livelihoods for local communities. The tourism sector in the region can avoid the negative impacts inflicted by degraded ecosystems. In addition, the GEF intervention also makes possible the preparation of the first regional joint stock assessment and to provide support for the introduction of Voluntary Guidelines for Securing Sustainable Small Scale Fisheries developed by FAO to the region.

In terms of conserving and restoring coastal and marine ecosystem, the GEF's intervention will improve regional coordination and cooperation through the creation of education and political networks between Mexico and the United States Concerted actions will take place under the project, including training a minimum of 800 local residents on mangrove restoration practices and indicators, awareness raising workshops to reduce waste water and solid waste generation, eradication programs for invasive species populations, and diversification of economic activities related to mangrove, and potential scale-up in non-pilot areas.

To sum up, incremental cost funding is required from the GEF to boost major coordination efforts while at the same time consolidating the governance framework, which will assist the region in making the transition towards more sustainable arrangements, gradually reducing dependency on donor support. This project will result in improved ecosystem-based management and sustainable use of resources by agreeing to and implementing appropriate institutional, governance and management arrangements that will enhance the protection of biodiversity, enable the recovery of depleted fisheries and strengthen the livelihoods of local communities dependent on the GoM LME resources, while at the same time reducing pollution.

Without the GEF's investment, the implementation phase of the SAP would very likely be at stake, discouraging the stakeholders that have been actively involved in the past few years. Delayed implementation of the SAP would incur the reduction or impairment of ecosystem services and functions, ensuing loss of globally significant biological diversity, combined with collapse of fish stocks and significant economic difficulties in the region (particularly for Mexico). Without a concerted ecosystem-based regional approach supported by the GEF, the present rates of pollution, habitat degradation and living marine resources depletion are unlikely to slow down.

The proposed GEF increment will allow bridging the gaps identified in the baseline project and will be catalytic to mobilize additional co-financing by Mexico and the US to address priority issues identified by the countries in the SAP for the GoM LME. Building up on the baseline project, with a total forecasted expenditure of US$164 million, the proposed GEF increment will mobilize complementary co-financing totaling US$124.21 million from UNIDO and most importantly from Mexican and US institutions involved in pollution control, fisheries and ecosystems conservation (US NOAA, SEMARNAT, SEMAR, CONAGUA, IMTA, INAPESCA, CONAFOR, CONANP, INECC, CONABIO and the State Government).

The incremental GEF investment of US$4,967,415 proposed for Component 1 Improve Water Quality will be matched by in kind contributions from SEMARNAT, CONAGUA, IMTA and US NOAA with total value of US$48,024,528.

The GEF incremental investment proposed into Component 2 Avoid Depletion and Recover Living Marine Resources of US$5,120,700 will mobilize co-financing by SEMARNAT, INAPESCA and US NOAA amounting to US$49,144,994.

The proposed GEF investment into component 3 Consverve and Restore the Quality of Coastal and Marine Ecosystems through Community Involvement and Enhanced Bilateral Cooperation of US$1,971,000 will be met by an in kind co-financing of US$18,929,849 provided mainly by CONAFOR, CONANP, SEP, SEMARNAT and PROFEPA.

The GEF incremental funding for Monitoring and Evaluation and PMC of US$226,000 will be met by co-financing of US$2,195,779 of which US$150,000 per year for 5 years (a total of US$750,000) will be from the SEMARNAT and additional co-financing of approximately US$1,445,779 will be mobilized by the Executing Agencies and US NOAA.

Given the very high level of ownership that has been demonstrated during the SAP development project and throughout the PPG phase, and the continued interest generated which is bringing to light additional collaborative opportunities, it is considered highly likely that additional co-financing will be provided as the project becomes operational. The provision of technical assistance to industries for the application of the UNIDO TEST methodology can be expected to leverage a significant additional private sector investment into resource efficient cleaner production technologies and environmentally sound technologies. In comparable projects the leveraged private sector investment ranged between US$15-20 million.

5. Global Environmental Objective

The principal global benefit of the project is an enhanced understanding of LME functions, to serve as input into LME management strategies in support of the TDA and SAP processes, and to establish an enabling environment, and ecosystem-based management practices that will contribute to the protection and maintenance of ecosystem functions and services.

The GoM-LME's primary productivity supports an important global reservoir of biodiversity and biomass of fish, sea birds and marine mammals. The LME supplies a diverse range of goods and services to the global community but these stand threatened by human-induced pressures, including overfishing. These threats are transboundary in nature, and cannot be effectively abated through stand-alone national initiatives.

Global benefits can be secured through the institution of an LME ecosystem-based management framework, allowing the countries to strengthen the management of LME living resources, and address land-based and marine pollution including the reduction of nutrient loads that contribute to hypoxic zones in the LME.

Transboundary threat cannot be effectively abated through stand-alone national initiatives. The bi-national nature of the proposed project will achieve global benefits through the institution of an ecosystem-based management framework in the region. The expected result of the set of interventions will be to reduce coastal pollution and improve water quality, restore damaged habitats, and restore depleted target fish stocks.

The project works on reducing pollution and improving water quality in four major hot spots in Mexico: the Papaloapan, Panuco, and Grijalva-Usumacinta, and the lower part of the Coatzacoalcos. The existing development plan for the region (Plan Veracruzano de Desarrollo 2011-2016) recognizes that significant levels of pollution are caused by inadequately treated or untreated industrial wastewater discharges. The project will increase the treatment ratio for industrial wastewater from 40% as it stands in 2014. Given that industrial discharges account for 68% of the volume of treated waters discharged into rivers and streams, and 76% of BOD_5 load, the project will improve water quality and reduce hypoxic zones in the four project sites.

The global environmental benefits from previous TEST methodology application in Mexico (Veracruz, Tabasco and Chiapas), and Central America (Honduras) in a wide range of industries have achieved significant impacts, including water use down by 5% to 80%, energy use down by 25%, BOD_5 level down by 60%, salts from dyes down by 60%, and microbiological parameters down by 60%. For the proposed project, actual pollution load reduction figures achieved will depend on industry size and sector. It is expected that the proposed project will result in conservative (low end) average reductions for BOD_5, N and P of 15%, a minimum reduction of water use by 10% by the industries. In particular, the sugar mill sector in Veracruz will present huge potentials for significant BOD_5 load reductions.

At this stage of the project cycle, with the participating industries not yet confirmed, it is not possible to quantify the pollution load and water use reductions the provision of technical assistance to Mexican industry clusters operating in the hot spot areas in in the four priority river basins will actually result in. Nevertheless experiences gained from the application of the UNIDO TEST methodology in comparable projects can be used as a reference. With a total project budget of US$2 million provided by GEF and the Government of Italy for the provision of technical assistance for the application of the TEST methodology to 43 industries in the Mediterranean, this project has resulted in BOD_5 load reductions of 3,238 t/yr, COD load reductions of 4,535 t/yr, and 9.7 m^3 water savings per year. Furthermore energy savings totaling to 263 GWH/yr could be realized. This project has leveraged US$20 million in terms of direct investments by manufacturing industries in Environmentally Sound Technologies resulting in economic savings of US$17 million/year for the industries. Comparable results can be expected for Mexico, where 50 industries will be addressed.

The project will contribute to recovering marine resources including fish and shellfish stocks in the region. The 2012 National Fisheries Charter 1 indicated that 76% (179 out of 236) of marine species of commercial value on the Mexican side of the GoM is not known, and that 16% of known ones are exploited at maximum sustainable yield (MSY) and 7% are depleted. The project will improve our updated understanding of fish stocks in the GoM region. And the adoption of new catch-level advice based on joint stock assessment report can potentially restore or rebuild stocks for the king or Atlantic Spanish mackerel fishery (Scomberomorus cavalla or S. maculatus), red grouper fishery from Yucatan (Epinephelus morio), and brown shrimp fishery from Tamaulipas (Farfantepenaeus aztecus - at MSY). Detailed information on fishery outcomes will be reported at the monitoring and evaluation stage.

The approximate volume of overexploited fisheries worldwide is 15 million tonnes (19% of the total production of capture fisheries(FAO, 2009). Programme 7 of the GEF IW3: Foster Sustainable Fisheries aims to contribute to restore 20% of those 15 million tonnes, i.e., 3 million tonnes.

The PIF estimated the contribution to reducing global overexploitation at 0.4% (to be defined during the PPG stage). As the species have now been confirmed, Dr. Alvaro Hernández Flores, Profesor-Investigador with the Universidad Marista de Mérida, has estimated that with the support of the SAP Implementation Project and the resulting application of best practices in the development and implementation of management plans, the effective implementation of the FAO voluntary guidelines for securing sustainable small scale fisheries and the resulting reduction of IUU the following reductions in overexploitation of fish stocks in the GoM can be achieved:

Mackerel	21,000 tonnes
Red grouper	9,000 tonnes
Shrimp	16,000 tonnes
Other small-scale fisheries species:	15,000 tonnes
TOTAL:	61,000 tonnes

This reduction of overexploitation by 61,000 tonnes is equivalent to 2.03% of the 3 million tonnes overall goal for the GEF IW3 Programme 7.

With regard to the global benefits in restoring ecosystem, considering that SAP development project successfully restored 1,325 hectares of mangroves, the proposed project will create a much larger impact in the conservation and restoration of target ecosystems. Although it is hard at this stage to estimate with any precision the number of hectares that will be restored (as this depends on the exact sites that will be chosen at start of the project) a low estimate was made of 3,000 hectares (see 3.2.1 Validation of restoration sites).

At national level, existing water quality-monitoring mechanisms will be updated and revised by IMTA/SEMARNAT to comply with the requirements of the new Standards that will come into effect at the end of 2016 and which will require inclusion of additional indicators to be monitored in the country. This will assist the Mexican government to comply with the new Official Mexican Standard for wastewater discharges and identifying corresponding measures. The project will further contribute to global environmental benefits by reinforcing information systems and exchange, and capacity and mechanisms for stakeholder participation, which will also support the countries in their efforts to adapt to climate change.

The expected result of the set of interventions will be to reduce coastal pollution, restore damaged habitats, and restore depleted stocks. The SAP Implementation Project will make an important contribution by providing the needed building blocks such as information systems and information exchange, reinforced capacity and mechanisms for stakeholder participation. An enhanced knowledge of the oceanography of the GoM-LME will assist the countries in addressing uncertainty regarding ocean-atmosphere links.

As has been described above, it is highly likely that the present types of single-country, sectoral-based interventions will continue and will achieve some results, both in Mexico and the United States. However, in the absence of a catalizing GEF funded intervention, the coordinated efforts required to deliver the long term vision required to support the recovery of the GoM-LME will not be efective in halting the pace of environmental degradation.

As has been established by the SAP, without a concerted ecosystem-based regional approach to environmental management it is unlikely that the present rates of pollution, habitat degradation and living marine resources depletion will be slowed.

The likely consequence of such a scenario is the reduction or impairment of ecosystem services and functions, loss of globally significant biological diversity during the next century, combined with collapse of fish stocks and significant economic difficulties in the region (particularly for Mexico).

6. Innovativeness, Sustainability and Potential for Scaling Up

The project is innovative in the following ways:

Firstly, the project represents a bi-national integrated effort to enhance the use of natural resources and ensure the provision of goods and services to the Gulf's bordering nations. The integrated ecosystem approach recognizes the physical, biological, economic and social interactions among the affected components of the ecosystem and attempts to manage natural resources management issues with an eye to achieve relevant societal goals. The project includes activities that both protect and aim to restore the ecosystem and involve the communities and industries dependent upon it. The development and implementation of the first joint stock assessment for a commercially and socially important species is a historic first between Mexico and the United States. The project will also enhance protection mechanisms through for example the establishment of the first “real time” Early Warning System to alert the population when health warnings are triggered or pollution events or peaks occur or are reached.

Secondly, the project implements three distinct but interrelated sets of actions targeted at addressing the root causes for three main objectives identified by the SAP: water quality, avoidance of depletion and recovery of living marine resources; and, conservation of the coastal and marine ecosystem. As such, project interventions will provide comprehensive management tools to address the root causes of ecosystem degradation in the GoM. For instance, the project, through Mexico’s National Commission for Natural Protected Areas (CONANP), sets to promote ecotourism as an alternative economic livelihood among local communities. Such a bi-national and integrated ecosystem approach can deliver sustainable results at both national and regional levels.

Thirdly, the improved data comparability and accessibility in the two countries through project implementation will smooth future collaborations in coping with ecosystem issues in the region. The project will also improve the technical capacity for continuing utilization of the TEST methodology at the regional level in the areas other than pilot areas. Capacity development through jobs skill trainings will provide opportunities for both men and women in the communities to develop skills that will improve their livelihoods and their interaction with natural resources.

The project will address the issues of sustainability at the following levels:

Institutional Sustainability: The TDA/SAP development process has demonstrated participating countries’ commitment to long-term environmental objectives and their strong willingness to implement the SAP. The project is likely to be sustainable through mainstreaming the TEST methodology and tools, improving data comparability and accessibility at the institutional level, and conducting broad range of awareness raising and dissemination activities to the private sector. Participating enterprises will have the technical knowhow to adopt one or several of the four TEST methodology components to improve their business models.

Financial Sustainability: One of the main indicators of financial sustainability is the extent to which Mexico and the United States undertake the financing of related project activities after completion. The project implementation will engage all relevant institutions in a dialogue to reach agreement on the future financing of SAP implementation once the project is completed. The countries have expressed their willingness to consider making substantive financial contributions to the project through their co-financing approved by participating government agencies.

Social Sustainability: Active engagement of relevant stakeholders in project activities is an important indicator of the social sustainability of the project. The PPG phase has brought about high-level awareness amongst decision makers and generated a very high level of interest and buy-in.

Scale-up potentials

The GoM SAP Implementation Project has a strong potential for providing experiences and lessons that can be adapted to other regions of the world, particularly those aiming to adopt ecosystem-based management approaches to conserve nature resources and better manage Large Marine Ecosystems.

Through revision of national standards and preparation of legislative changes, the project will engage a broad spectrum of stakeholders, which will ensure the long-term impact of project outcomes. For instance, the Project Steering Committee, which is consisted of high-level official country representatives from the United States and Mexico, and relevant stakeholders from academia, CSO and NGOs), will continue to work on the dissemination of project results. This can serve as a catalyst for more sustainable results.

The introduction of TEST to pilot sectors will address the needs for technical assistance to industries and assist them in complying with revised regulations and national standards and increasing productivity. The selected industries are likely to benefit from improved resource efficiency through the adoption of cleaner technologies. The project will document experiences that can be shared with other non-pilot industries and other sectors. Upon completion, NCPC-TU can provide services in the country for the wide roll-out of TEST methodology. Therefore, the project will help scale up the development of green industries along the coast of the GoM.

Training workshops and regional dissemination seminars will be conducted to share project results with public and private stakeholders and promote replication in other businesses and areas of Mexico. The project will also document the lessons from this training in a form that facilitates their replication, and will actively participate in GEF and other activities that seek to promote replication and sharing of experiences, such as the IW: LEARN initiative.

A.2. CHILD PROJECT?

If this is a child project under a program, describe how the components contribute to the overall program impact.

N/A

A.3. STAKEHOLDERS

Identify key stakeholders and elaborate on how the key stakeholders engagement is incorporated in the preparation and implementation of the project. Do they include civil society organizations (yes ☒ /no☐)? and indigenous peoples (yes ☐ /no ☒)? [50]

Numerous partners were identified and were involved during the SAP Development Project, and it is considered highly likely that these will continue to be involved in the project. In support of this assumption, it is important to point out that the PPG phase was remarkable in that it rekindled high-level awareness raising of decision makers and ultimately generated a very high level of interest. At a very late stage in the preparation of the FSP government agencies seldom in need of communicating and less so of coordinating interventions were brought together under a common goal. The countries ownership of this project has never been more horizontally integrated.

In Mexico SEMARNAT will be the key government partner for implementation, as well as the technical focal point of the project. The Ministry is responsible for all environmental affairs.

NOAA is the United States' technical focal point for this project. Its role will be to coordinate co-financing from the USA and take a leading advisory role in Output 2.2. NOAA is also a key member of the Steering Committee.

[50] *As per the GEF-6 Corporate Results Framework in the GEF Programming Directions and GEF-6 Gender Core Indicators in the Gender Equality Action Plan, provide information on these specific indicators on stakeholders (including civil society organization and indigenous peoples) and gender.*

Regarding execution of on-the-ground activities, different partners will be involved in different components, including:

Component 1 - CONAGUA, the national commission in charge of water quality as well as the IMTA responsible for water technology will support strengthening of monitoring capacities, the National Cleaner Production Center Tabasco Unit (NCPC-TU) will support application of the TEST Methodology, the CINVESTAV for environmental monitoring, SEMAR in charge of the National Oceanographic Information Archive and CANOABIO for the environmental information system will be the major partners. During the above-mentioned SAP Development Project, the staff of the NCPC-TU was trained in this UNIDO tool, especially the regional Tabasco office staff, which is the center of the four watersheds to be addressed by this project.

Component 2 will include INAPESCA as Executing Agency, and CONAPESCA as main stakeholders. They will be supported by FAO who will provide technical assistance.

Component 3 will rely on the expertise of CONANP, the national commission for protected areas as well as of CONAFOR the National Forest Commission, the Autonomous University of Yucatan (UADY) and the National Institute of Ecology (INECOL).

The project will involve civil society organizations where possible. For example, the Network of Wetland Restoration Communities established under the aegis of the SAP Development Project, as well as others (see table below – non exhaustive). The active participation of local communities and vulnerable and marginalized population sectors will be sought, encouraged and supported. Full participation of communities dependent on the costal and marine ecosystems of the GoM for their livelihood will ensure that the proposed demonstration activities do not negatively affect their current livelihoods, and will guarantee that they reap the long term benefits provided by the resources offered by the coastal and marine ecosystems they are the custodians of.

Mexico		
Stakeholder; website	**Status/Function**	**Relevant activities in GoM**
Centro Mexicano de Derecho Ambiental; http://www.cemda.org.mx	Private civil association. Contribute to the strengthening of national efforts in environmental protection	Focus on the sustainable management of natural resources and environmental protection, with emphasis on natural protected areas and species with priority for conservation
Mexican Fund for the Preservation of Nature (Fondo Mexicano para la Conservación de la Naturaleza – FMCN); http://www.fmcn.org	Private civil association for biodiversity conservation	Conservation of biodiversity of Mexico and ensuring sustainable use of its natural resources, through the promotion of strategic actions and medium- to long-term financial support
Pronatura; http://www.pronatura.org.mx	Private civil association. Conservation of flora, fauna, and priority ecosystems	Work program focuses on more than 500,000 ha of wetlands in five reserves in the Yucatan Peninsula, and in conservation, monitoring, environmental education, and creation and strengthening of local capacity. Among Pronatura's branches are Pronatura Península de Yucatán, Pronatura Noreste A.C., and Pronatura-Veracruz

A.4. GENDER EQUALITY AND WOMEN'S EMPOWERMENT.

Elaborate on how gender equality and women's empowerment issues are mainstreamed into the project implementation and monitoring, taking into account the differences, needs, roles and priorities of women and

men. In addition, 1) did the project conduct a gender analysis during project preparation (yes ☒ /no☐)?; 2) did the project incorporate a gender responsive project results framework, including sex-disaggregated indicators (yes ☒ /no☐)?; and 3) what is the share of women and men direct beneficiaries (women 55%, men 45%)? [51]

In support of GEFs Policy on Gender Mainstreaming, gender issues are mainstreamed in the project at all levels. Gender equality is ensured by granting representaives of both genders equitable access to sensitization, training and capacity building activities, by ensuring an equitable representation of both genders in all project committees and by ensuring an equitable representation of women and men amongst the experts to be recruited for the execution of this project. The TORs for the National Project Coordinator and other PMU staff will request her/him to complete the basic online course; I Know Gender Course on UN Women's eLearning Campus https://trainingcentre.unwomen.org.

The obligation to mainstream gender and to promote gender equality will be an integral element of the sub-contracts UNIDO will conclude with the national executing partners. Adherence to this obligation will be continuously monitored by the PMU by means of verifying gender disaggregated data on activities executed and support provided by the national execution partners against the gender related targets set out in the project results framework. Information on gender equality will be provided in the baseline report, in the PIRs, the mid term review and the final evaluation.

Men and women assume different roles and responsibilities in activities that are relevant to conserving natural resources. In coastal communities of the GoM, women play an important role in contributing to the local economy and family income by performing activities that are essential to the family and community welfare. The project will find and collect information to understand the roles and responsibilities of women in household activities and how they participate in domestic and public decision-making. Targeted capacity building programmes will be conducted in 10 local fishery communities.

Gender differences exist in rights and access to natural resources including land and water for the local fishery communities. For example, women and men have unequal access to technology, information, and training related to natural resources, such access remains biased towards men in spite of numerous efforts to mainstream gender dimensions. The project will engage women groups and organize forums that are targeted at women to improve their participation community decision-making and involvement in education and family support.

To achieve sustainable livelihood in local communities, the project will verify opportunities to improve women's job skills, start or improve local businesses, create more spaces in civil society for women's participation, and receive training in nutrition, health and formal organization for effective participation in the community. Women will also be encouraged and supported by FAO or INAPESCA to organize themselves into post-harvest groups. FAO will prepare proposals to strengthen women's participation in productive activities, through training to improve their skills. These women involved in small scale fisheries will benefit from capacity building and support to empower them to engage positively in the process of fisheries management plan improvement, and business development/operation.

In Monitoring and Evaluation activities, gender indicators will be integrated to ensure gender equity during project implementation. The change in status of men and women in the course of project implementation will be tracked through the adoption of gender-sensitive indicators. The project will help to develop strategies to ensure that gender considerations become part and parcel of conservation activities.

[51] Same as footnote 8 above.

Overall, the design of community-level engagement activities in the project paid special attention to acknowledging women's voices and concerns. For instance, local and regional training workshops will be conducted to include contents that sensitize project proponents about gender equality. Through assisting women's groups in provision of services to improve their livelihoods, improved ecosystem service will provide better socioeconomic benefits and living conditions to local communities including women.

The efforts to mainstream FAOs Voluntary Guidelines for Securing Sustainable Small-scale Fisheries (VGSSF) through the Project's activities will facilitate access to technical assistance and guidance to realize initiatives that support and foster gender equality in the 10 fishing communities in the coastal states of Campeche, Veracruz and Yucatan. These activities will be closely coordinated with the priorities and interventions of the National System for Integral Development of Families (DIF – Desarrollo Integral de la Familia) and with the National Women Institute (INMUJERES – Instituto Nacional de las Mujeres).

Finally, awareness raising campaign will include activities and materials targeted to these women groups to ensure their active involvement and support efforts to organize and diversify. Also, as mentioned previously, the involvement of women in mangrove restoration activities has in past proved crucial for success and this will be built on to strengthen a broader set of capacities. Women will be given a leading role in the up-scaled activities.

A.5 RISK.

Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):

The long-term success of regional-scale marine ecosystem management programs largely depends on the political willingness of the participating countries to cooperate; their willingness to continue project programs and approaches after the completion of the GEF intervention; and the extent to which activities successfully engage the broad spectrum of stakeholders that are involved in the project. Political risks, social and environmental risks, climate change risks confronting the SAP implementation phase have been evaluated and risk mitigation measure designed during project implementation.

The table below summarizes the foreseen risks. Given its direct relevance, additional information regarding the environmental risk dimension, and in particular the mitigation measures in place or being implemented is provided after the table.

Risk	Rating	Mitigation
Political risks: **Governments at all levels and key stakeholder groups lack commitment or incentives in undertaking required actions, or sectorial, institutional, legal and economic reforms and implementing agreed regional management**	L	The project has been endorsed by both countries, at all levels and is building upon existing initiatives that will lay a strong basis for effective implementation of the SAP In addition, the PPG phase contributed to extensively promote and clarify the roles and responsibilities of stakeholders and the expect project outcomes. Inter-sectorial and inter-governmental committees have been defined and put in place to overcome the political and institutional risks associated with lack of commitment and coordination. The project is in line with agreed strategies and SAPs at regional, and national levels. Participating partners have shown support and effective collaboration for the project during the SAP

framework.		Development Project and the PPG stage. All of the interventions and activities of the Project fit under the overarching framework of a complex set of laws, rules and regulations designed precisely to avoid backlashes to vulnerable sectors or the environment.
Political risks: **Relevant government agencies not willing to share and provide data and information**	L	The GoM-LME SAP Development Project established mechanisms in support of data comparability and compatibility between Mexico and the United States These are now entrenched in the Project and the improved understanding of regional Data and Information Management (DIM) system amongst stakeholders will continue to increase appreciation of benefits. Additional collaborative activities will strengthen mechanisms to further facilitate access to data and information, promote data comparability and compatibility, supporting the sustainability of project results. The PPG stage has secured agreements on facilitating cross-sectorial sharing of data between scientific and technical groups in the two countries. There is also strong government support for the launch of the early warning system. Cooperation on data management and analysis using statistical tools, GIS and modeling is ongoing and will be strengthened, for example through partnership with the training activities planned by USGS (U.S. Geological Survey) The proposed project will present and disseminate information generated, including in color-coded maps and formats.
Political risks: **Structural changes and resulting reshuffling and/or downsizing of governments, in response to the global economic slowdown could hinder project implementation** **Changes in federal administrations in the two countries and/or cabinet reshuffles are not in synchrony, which requires strong efforts from within the federal staff to maintain productive partnerships after each**	L	The PPG phase was instrumental in garnering a very high level in inter-ministerial commitment, at the highest levels. The fact that 7 national Executing Agencies (all from the public sector) are involved in the delivery of results is considered a strong mitigating factor. Timely political intervention from the Project Coordination Unit will strive to minimize effect of this risk on current activities and to prepare the terrain for future ones. This proactive role is an intrinsic function of the PMU Coordinator The redefined entities/actors responsible for the new budgets and expenditures will be sensitized and updated on progress regarding Project actions and priorities

election		
Institutional risks: **Lack of capacity in national partners to manage and execute the project.**	L	National partners have developed core capabilities to work in collaboration with international partners on water and ecosystem issues. Additional technical trainings will be conducted to further build the capacities of national executing agencies.
Institutional risks: **Failure to mainstream SAP targets at national and local levels may impede long-term sustainability and replicability of project outcomes.**	L	When compared with other IW projects addressing similar sized water bodies, political and institutional risks are considered to be low given the number of countries involved and the two countries' strong willingness to implement the SAP Project activities and scopes have been discussed and agreed with participating government agencies at both national and local levels. Existing co-financing commitment displays countrie's willingness to mainstream project outcomes into national policy framework. In addition, project operations will focus on building national ownership and transfer capacity into national results, which will ensure continuity of impact beyond the life of the project.
Institutional risks: **Insufficient interest from regional stakeholders and beneficiaries to collaborate in project activities.**	L	UNIDO is in discussion with other agencies including FAO, UNEP, UNDP, the World Bank, and IADB to develop strong support for a shared vision. As an example, FAO will provide technical assistance to training activities.
Climate Change risks: **Sea level rise, increased temperatures and decrease in oxygen concentration, ocean acidification, and increased magnitude and frequency of extreme weather events will exacerbate existing risks to which populations, ecosystems and natural resources are currently exposed in the GoM**	M	Vulnerability assessments and implementation of adaptation measures is performed locally in response to particular conditions, with actions that strengthen the resilience of the population and reduce vulnerability of ecosystems, production systems and strategic infrastructure to climate change The Project will improve ecosystem-wide collection of water quality data and will inform the public in a timely and effective way. As well, strong support and guidance will be provided to assist industry to reduce water use and contribute to the improvement in released water for downstream use. Developing collaborative models and projects in coastal communities, emphasizing on the ground planning and adaptation activities as well as those increasing resilience of coastal communities such as restoration of mangroves, which protect the coast from erosion and assist in improving water quality will contribute to reducing the effects of this risk.
Social and		The PPG phase has demonstrated that there is high ownership with sector specific responsible entities taking the lead in the

environmental risks: **It could be difficult to engage private sector partners in the adoption of TEST methodologies to translate public efforts into tangible economic benefits for industries, businesses and local communities.**	M	design and execution of activities. This will send a strong message to industry, as regulations (in the pipeline or planned) in support of these interventions will help to guide changes and will ensure the sustainability of results. Jointly defined regional coordination mechanisms will demonstrate the long-term benefits to the productive sectors. In addition, in order to put into practice the proposed mechanisms, the project will demonstrate that further investments (private) will be less onerous than costs accruing from lack of action. For this purpose, trainings will be conducted to raise the awareness in the private sector and fishing communities over the long-term benefit of the project. UNIDO will also draw lessons learned from previous experience working with partners in the region to ameliorate a portion of the risk.
[Rating: L = Low Risk; M = Medium Risk; H= High Risk]		

Climate variability and change are expected to directly affect the coastal and marine ecosystem and production systems of the GoM-LME posing significant challenges for their adaptation of over the next decades. The characteristics of the impacts to the regions populations and economies, and the responses put in place to address them, will depend on the type of system as well as the level of risk to which these are exposed. In Mexico there are a great diversity of ecosystems producing a significant amount of environmental services, seriously threatened by human activities, as well as by the effects and impacts of climate change.

Impacts will likely include sea level rise, increased water temperatures (often associated with coral bleaching) and decrease in oxygen concentration notably in coastal zones, ocean acidification, and increased magnitude and frequency of extreme weather events (hurricanes, as well as storms and on the other side of the scale, droughts). This will exacerbate some of the risks to which populations, ecosystems and natural resources are currently exposed in the GoM, such as land use change and alteration of the hydrological cycle in wetlands. Widespread loss of habitats such as seagrass beds and mangroves could also exacerbate climate change by a reduction in their carbon sequestration function[52].

The high level of regional dependence on the marine environment and its resources, combined with their high environmental vulnerability underscores the importance of sustainably exploiting these resources, especially with regard to a changing global climate over which countries have little or no control[53]. It is considered imperative to maintain healthy coastal habitats to increase their resistance and resilience to the impacts of internal and external anthropogenic and natural pressures.

This risk however is now considered low In Mexico and one strong argument in favour of this lies with the relatively recent General Law on Climate Change (DOF 2012), which under Article 26 Section XI, states that

[52] Sherry Heileman, Ph.D. Centre for Resource Management and Environmental Studies, 2007

[53] Ibid.

“In the formulation of the National Climate Change Policy, the principles to be observed are: (XI) Conservation of ecosystems and biodiversity, prioritizing wetlands, mangroves, reefs, dunes, lagoons and coastal areas, providing essential environmental services to reduce vulnerability.”

Article 8 further states that all federal and state entities must, in accordance with the National Policy, align their policy and legal instruments to include mitigation and adaptation to climate change. It is in line with this directive that the National Institute for Ecology and Climate Change (Instituto Nacional de Ecología y Cambio Climático - INECC) was created.

It is important to note, as this addresses one of the risks identified that the General Law on Climate Change, (Article 15) refers to environment, sustainable development and mitigation and adaptation (and the need for the relevant assessments supporting these actions) in 4 of the 7 overarching attributions of the INECC;

Coordinate, promote and develop, with the corresponding participation of other departments and agencies, scientific and technological research related to the national biosafety policy, sustainable development, environmental protection, preservation and restoration of ecological equilibrium and ecosystem conservation and climate change;
Carry out foresight analysis by sector and cooperate in the development of strategies, plans, programs, instruments and actions related to sustainable development, environment and climate change, including the estimation of future costs associated with climate change and the benefits arising from actions to address it;
Evaluate compliance of the objectives of adaptation and mitigation as well as of the goals and actions contained in the National Strategy on Climate Change, the Special Program of Climate Change and the programs on climate change of all the States in the Federation;
Prepare recommendations on the policies and actions to mitigate or adapt to climate change as well as on the assessments made in this respect by the dependencies of the Federal Government, the States and Municipalities.
Furthermore, to guarantee the transversal adaption of mitigation and adaptation strategies to climate change, Article 45 of the Law establishes the Inter-secretarial Commission on Climate Change. This is chaired by the President of Mexico and comprised of the ministers of Environment (SEMARNAT), Agriculture SAGARPA, Health (SALUD), Communications and Transport (SCT), Economy (SE), Tourism (SECTUR), Social Development (SEDESOL), Interior (SEGOB), Navy (SEMAR), Energy (SENER), Public Education (SEP), Finance and Public Credit (SHCP) and Foreign Relations (SRE).

Finally, Article 107 states that this Commission, in coordination with the National Institute of Geography and Statistics (INEGI) and INECC will develop and maintain a web based portal summarizing the general situation in the country as regards climate change and the results of assessments of the National Policy on Climate Change (http://www.semarnat.gob.mx/temas/cicc).

The international scope of the GoM-LME Project, combined with its relatively long history have fomented a very high level of awareness amongst the countries in the region, as well as for all stakeholders. From focal points at the Federal, provincial or municipal levels, to individuals in isolated fisher communities; from stakeholders in large multinationals to academicians, the overarching principles guiding interventions has always systematically been to protect the GoM to achieve environmental and social sustainability.

The Project since conception has by this nature followed design criteria that converge towards the improvement, rehabilitation and avoided depletion of the GoM resources and this has always been considered to include the ultimate users and custodians, i.e. the population living on these sites. To this effect the Project has sought to integrate internationally accepted management practices which have been meticulously applied by UNIDO. This has been documented in the M&E efforts of the PMU, and innumerous reports including evaluations of the SAP Development Project.

To date mitigation measures have not been necessary, or rather, the positive achievements have made it clear that maximizing the results, via replication and extension in the scope of interventions, are required to extend the benefits achieved. Although many of these results are intangible for the population (Standards to improve water quality, improvements in water quality (TEST), development of FMPs, etc.), what is clear is

that empowering communities to restore the resources they depend on for subsistence, while at the same time introducing the possibility of alternate sources of revenue, have made a tangible difference. Women in marginalized communities have become leaders and revenue generators, health and education are no longer inaccessible dreams.

All of the interventions and activities of the Project fit under the overarching framework of a complex set of laws, rles and regulations designed precisely to avoid backlashes to vulnerable sectors or the environment.

A.6. INSTITUTIONAL ARRANGEMENT AND COORDINATION.

Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.

UNIDO will implement this project through the Ministry of Environment and Natural Resources (SEMARNAT). SEMARNAT will be the lead governmental partner and will work in close cooperation with other relevant Ministries. The project will be excuted by 7 national Executing Agencies, which have been identified during the PPG phase in line with their comparative advantages to provide the required subject matter expertise. Furthermore FAO will provide technical assistance to the INAPESCA the lead national institution entrusted with the Execution of Component 2 (Avoid depletion and recover living marine resources (Fish and shellfish). SEMARNAT a the lead governmental partner will chair the Project Steering Committee.

UNIDO, as implementing agency, has overall supervision responsibility and will ensure consistency with GEF and UNIDO policies and procedures. Having been engaged with SEMARNAT in the successful completion of the SAP Development Project, and completion of the GEF's TDA/SAP approach, UNIDO is in a privileged position to undertake the implementation of the Project.

A Inter-agency agreement will be formalized during the Project Inception Phase with FAO, a key UN system partner (through a standard UN inter-agency agreement). Other, non-UN partners include intergovernmental and non-governmental organizations such as the Mexican Institute of Water Technology (Instituto Mexicano de Tecnología del Agua - IMTA) of the SEMARNAT, the National Water Commission of Mexico (Comisión Nacional del Agua - CONAGUA) of the SEMARNAT, the National Cleaner Production Center – Tabasco Unit (NCPC-TU), the Center for Research and Advanced Studies (Centro de Investigación y de Estudios Avanzados - CINVESTAV), the National Protected Areas Commission (Comisión Nacional de Áreas Naturales Protegidas – CONANP), the National Commission for Knowledge and Use of Biodiversity (Comisión Nacional para el Conocimiento y Uso de la Biodiversidad – CONABIO), the National Fisheries Institute (Instituto Nacional de Pesca – INAPESCA), the Autonomous University of Yucatan (UADY – Universidad Autónoma de Yucatan), and the Institute of Ecology, A.C. (INECOL).

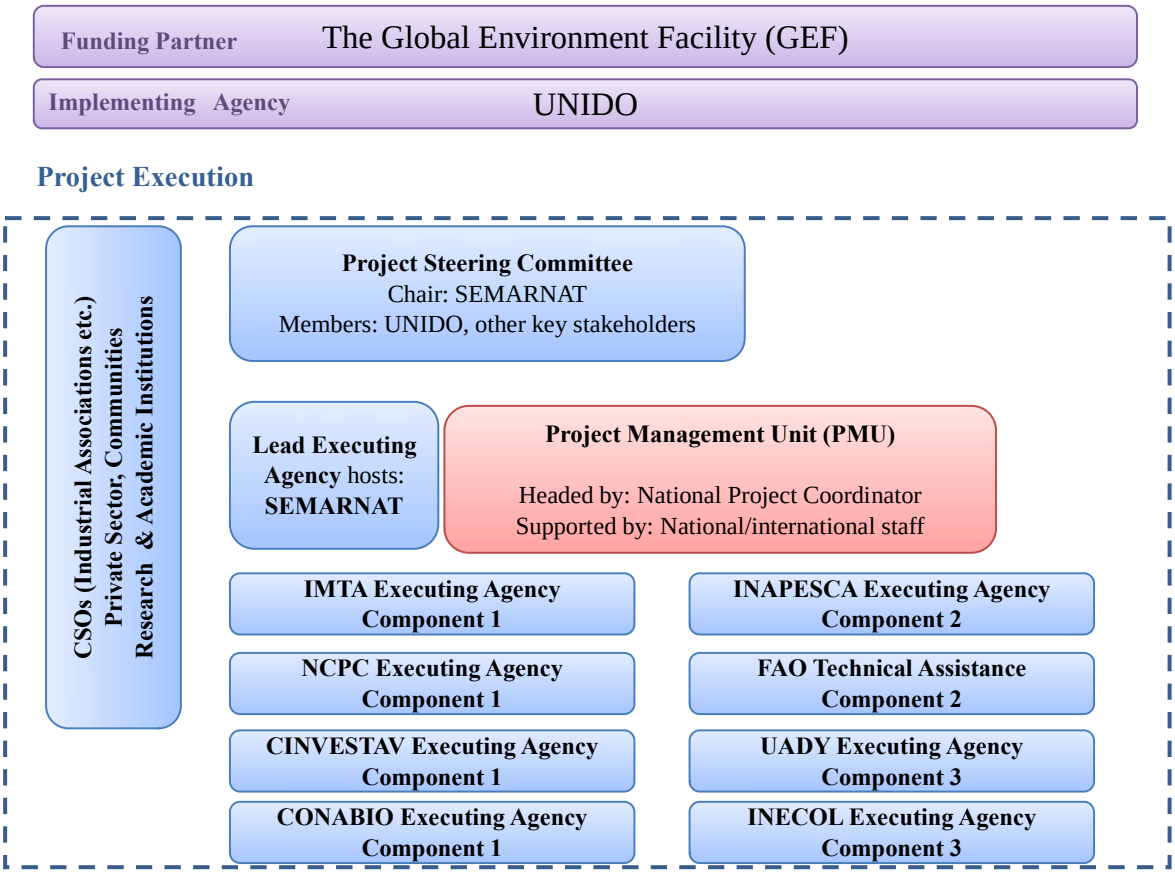
The roles of these project partners are in alignment with their formal mandates and/or comparative advantage. UNIDO has overseen the identification, and selection during the PPG stage and carried-out the due diligence assessments of the proposed Executing Agencies (EA). UNIDO will manage the contracting of the above-mentioned execution partners through established procedures.

A Project Management Unit (PMU) and Steering Committee will be set up, with the support of the SEMARNAT, and will be instrumental in coordinating the execution of all project activities, as well as in securing regional and cross-institutional collaboration to successfully implement the Project and ensure its sustainability. Amongst others this will support the effective coordination and implementation of project activities and although the Project Steering Committee (PSC) will have the attribution to make decisions, any major project amendment will be done in accordance with the approved Project Document and the GEF Policies (GEF C.39/04). Terms of reference for the PSC will be prepared by UNIDO and will be validated with the Project Focal Points.

Regional co-ordination and collaboration will be facilitated through the Project Management Unit (PMU), which will be provided with adequate space (premises), set up (basic office equipment including access to

printing and copying), and supported to manage and communicate results effectively and efficiently (telephone, fax, internet access). A National Project Coordinator will be recruited by UNIDO to facilitate and monitor the successful technical execution of project activities. The PMU will also recruit an Administrator who will, in addition to his regular functions, be in charge of the electronic monitoring system. He/she will ensure that all project related information is centralized and will keep track of progress of activities. He/she will alert the Coordinator in case issues with a particular deliverable are identified.

Secretarial support, as well as other staff/consultants working part-time/full-time will be brought on board as/when required. A Project Steering Committee (PSC), consisting of high-level official country representatives from the United States and Mexico, and including relevant stakeholders (including representatives of academia, CSO and NGOs), will oversee the implementation / execution of the project. It will meet at least once a year.



The GoM-LME Project, through the PMU, will coordinate activities and promote collaborative agreements, exchange of experiences and best practices, training workshops and synergies under the ecosystem based approach, in common areas of interest with the following:

National projects:

Coastal watersheds conservation in the context of climate change (SEMARNAT and Fondo Mexicano para la Conservación de la Naturaleza, A.C.);
Adaptation of coastal mangroves of the GoM to the impacts of climate change (World Bank, INECC, IMTA).
Collaborative opportunities are ongoing, specifically regarding community participation and exchange of experiences.

Adaptation, Land Use and Integrated Management Plan for the Grijalva and Usumacinta Watersheds (Government of Chiapas and Inter-American Development Bank)
The project provided comprehensive analyses on the forecasted effects of climate change and proposed adaptation measures to mitigate impacts on communities in the region. The Plan is expected to reduce climate vulnerabilities and create sustainable growth to the region.

Enhancing National Capacities to Manage Invasive Alien Species (IAS) (CONABIO)
A solid background of close collaboration already exists with CONABIO, which includes joint binational workshops and capacity building activities, as well as collaboration on the SAP Development Project (recipient of capacity building and equipment). Activities are proposed to continue and strengthen this collaboration.

World Bank Consolidation of the Protected Areas Program (SINAP II).
This project extended the protected areas program initiated with GEF funding in 1992 and restructured as an endowment fund to support conservation of 10 protected areas in 1997 (Project SINAP I), by adding 12 new protected areas to the program.

Strengthening Management Effectiveness and Resilience of Protected Areas. GEF-Resilience.
Improvement of the effectiveness to manage 17 priority NPAs in order to reduce the impacts and threats of climate change to biodiversity, by building and strengthening capacities of staff and local residents.

Strengthening Management of the Protected Areas System to Better Conserve Endangered Species and their Habitats. Invasive species.
Development and application of new tools on decision-making, information resources, and technical and financial capacities that will result in a proper implementation of Mexico's national strategy on invasive species.

<u>Regional projects:</u>

Mesoamerican Biological Corridor (WB, Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua and Panama);
Catalyzing Implementation of the Strategic Action Program for the Sustainable Management of Shared Living Marine Resources in the Caribbean and North Brazil Shelf Large Marine Ecosystems (CMLE) (Mexico, Central American States, Caribbean States and Brazil), assisting in facilitating the sustainable and climate resilient provision of goods and services from shared living marine resources;
Sustainable Management of Bycatch in Latin America and Caribbean Trawl Fisheries (REBYC-II LAC) (FAO);
Catalyzing Implementation of the Strategic Action Programme for the Sustainable Management of Shared Living Marine Resources in the Caribbean and North Brazil Shelf Large Marine Ecosystems (CMLE+) (UNDP);
Integrated Transboundary Ridges-to-Reef Management of the Mesoamerican Reef (WWF-U.S.)
<u>Bi-national projects:</u>

Regional Framework for Sustainable Use of the Rio Bravo (Mexico, U.S.);
Regionally, the project will collaborate closely with the recently approved Caribbean LME project and share experiences and results in order to maximize its implementation.

Cooperation with other UNIDO-led initiatives will also be sought. For example, the National Cleaner Production Center has ongoing cleaner production and TEST activities with a high synergy potential. UNIDO also has extensive experience working with SEMARNAT on projects associated to the Montreal Protocol. Such projects have on-the-ground experience with chemicals management and greening of industries. There is also potential for collaboration on a Montreal Protocol project currently under UNIDO’s development, which foresees the replacement of ozone depleting substances (ODS) with non-ODS in the fishery sector.

Strengthening of ties to WECAF (Western Central Atlantic Fishery Commission) will be sought - The general objective of the Commission is to promote the effective conservation, management and development of the living marine resources[54], in accordance with the FAO Code of Conduct for Responsible Fisheries, and address common problems of fisheries management and development (Recommendation WECAFC/15/2014/4).

A.7 BENEFITS.

Describe the socioeconomic benefits to be delivered by the project at the national and local levels. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCF/SCCF)?

The Gulf of Mexico LME supports an important global reservoir of biodiversity and biomass of fish, sea birds and marine mammals. The GoM SAP Development Project has contributed an enhanced understanding of LME functions and contributed to the formation of priority areas of action as proposed by the TDA and SAP. It has established an enabling environment for implementing ecosystem-based approach in the region for the protection and maintenance of ecosystem functions and services. The principal global benefits of the proposed project can be demonstrated in many ways.

Transboundary threats cannot be effectively abated through stand-alone national initiatives. The bi-national nature of the proposed project will achieve global benefits through the institution of an ecosystem-based management framework in the region. The expected result of the set of interventions will be to reduce coastal pollution and improve water quality, restore damaged habitats, and restore depleted target fish stocks.

The project works on reducing pollution and improving water quality in four major hot spots in Mexico: the Papaloapan, Panuco, and Grijalva-Usumacinta, and the lower part of the Coatzacoalcos. The existing development plan for the region (Plan Veracruzano de Desarrollo 2011-2016) recognizes that significant levels of pollution are caused by inadequately treated or untreated industrial wastewater discharges. The project will increase the treatment ratio for industrial wastewater from 40% as it stands in 2014. Given that industrial discharges account for 68% of the volume of treated waters discharged into rivers and streams, and 76% of BOD_5 load, the project will improve water quality and reduce hypoxic zones in the four project sites.

The global environmental benefits from previous TEST methodology application in Mexico (Veracruz, Tabasco and Chiapas), and Central America (Honduras) in a wide range of industries have achieved significant impacts, including water use down by 5% to 80%, energy use down by 25%, BOD_5 level down by 60%, salts from dyes down by 60%, and microbiological parameters down by 60%. For the proposed project, actual pollution load reduction figures achieved will depend on industry size and sector. It is expected that the proposed project will result in conservative (low end) average reductions for BOD_5, N and P of 15%, a minimum reduction of water use by 10% by the industries. In particular, the sugar mill sector in Veracruz will present huge potentials for significant BOD_5 load reductions. Please refer to the section on Global environmental benefits for additional information on results obtained by a comparable project successfully implemented in the Mediterranean in 43 industries.

The project will contribute to recovering marine resources including fish and shellfish stocks in the region. The 2012 National Fisheries Charter 1 indicated that 76% (179 out of 236) of marine species of commercial value on the Mexican side of the GoM is not known, and that 16% of known ones are exploited at maximum sustainable yield (MSY) and 7% are depleted. The project will improve our updated understanding of fish

[54] In the area of competence of the Commission which includes the Gulf of Mexico

stocks in the GoM region. And the adoption of new catch-level advice based on joint stock assessment report can potentially restore or rebuild stocks for the king or Atlantic Spanish mackerel fishery (Scomberomorus cavalla or S. maculatus), red grouper fishery from Yucatan (Epinephelus morio), and brown shrimp fishery from Tamaulipas (Farfantepenaeus aztecus - at MSY). It is expected that through these activities, overexploitation of the targeted species can be reduced by 61,000 tonnes. Detailed information on fishery outcomes will be reported at the monitoring and evaluation stage.

At national level, existing water quality-monitoring mechanisms will be revisited and revised by IMTA of the SEMARNAT to include additional indicators to be monitored in the country. This will assist the Mexican government in updating its Official Mexican Standard for wastewater discharges and identifying corresponding measures. The project will further contribute to global environmental benefits by reinforcing information systems and exchange, and capacity and mechanisms for stakeholder participation, which will also support the countries in their efforts to adapt to climate change.

With regard to the global benefits in restoring ecosystem, considering that SAP development project successfully restored 1,325 hectares of mangroves, the proposed project will build on this to maximize impact in the conservation and restoration of target ecosystems. Through these activities, and pending the verification of the exact communities in which the restoration activities will be executed, it is foreseen that a minimum of 3,000 hectares of wetlands will be restored. It is relevant to mention that empowering women to participate and lead in their communities, in particular through restoration activities and post harvest groups, has not only generated jobs, which is expected to continue to take place, and has forever changed the societal patterns that were previously taken for granted (roles of men vs. women).

In order to bring further improvement to women in the community, the Project will follow the human approach developed by Bronfenbrenner (1992), who considers the role of individuals at four levels: individual, microsystem, ecosystem and macrosystem. For the individual level, a diagnostic of the role of women in the family and community will be prepared, verifying examples of successful participation of women, and the main factors contributing to success. This will require questions such as: to what extent are women involved in the community development? What do they do for the welfare of their families and community? What do they do to increase family income? What do they do for children education? What do they do for their own welfare? What do they do to protect the environment? Is their participation individual or collective?

At the microsystem level (immediate environment), the involvement of women in local institutions (schools, family, church, workplace, neighborhood, and health services, among others) will be identified. The role of women in institutions, achievements and failures of institutions, the key factors determining institutional success, types of relationship between the institutions, and the influence of institutions on women will be addressed.

At the macrosystem level, beliefs regarding women's participation in endogenous development, their role in the village, type of involvement that they should have in education, family support, at work outside home (e.g. post- harvest), trade, politics and care of the environment will be addressed.

In addition, the analysis and reflection with women from fishing communities will result in proposals for productive projects eligible for funding. The focus of capacity building activities for women will be on:

Improving working conditions and developing business management skills of SMEs;

Value chain development including value addition, improved technologies, sustainable handling and processing practices which reduce waste;

Secure women’s equal participation in decision-making processes for policies directed towards small-scale fisheries. Adopt specific measures to address discrimination against women, while creating spaces for civil society organization.

Orientation on nutrition and growing backyard vegetables for self-consumption

Ecosystem restoration

A.8 KNOWLEDGE MANAGEMENT.

Elaborate on the knowledge management approach for the project, including, if any, plans for the project to learn from other relevant projects and initiatives (e.g. participate in trainings, conferences, stakeholder exchanges, virtual networks, project twinning) and plans for the project to assess and document in a user-friendly form (e.g. lessons learned briefs, engaging websites, guidebooks based on experience) and share these experiences and expertise (e.g. participate in community of practices, organize seminars, trainings and conferences) with relevant stakeholders.

At least 1% of the GEF grant will go towards supporting IW: LEARN activities, including regional IW: LEARN conferences, LME: LEARN, and other relevant mechanisms. Participation of at least two national representatives from each Mexico and the United States and relevant project staff to the IWCs being hosted during the project implementation period will be covered.

This will also include formulation of at least two experience notes, result notes as well as hosting and establishing a website within the IW: LEARN platform, contributing to improved collaboration and communication with other GEF-funded projects and initiatives.

Results from the project will be widely disseminated within and beyond the project intervention zone through existing information sharing networks and forums, including but not limited to IW: LEARN. These platforms will for example include the Environmental Monitoring System that will be developed by CONABIO and which will include the HABS system, the Early Warning System, etc.

The project will participate, as relevant and appropriate, in scientific, policy-based and/or any other networks (e.g. the LME Consultative Group, IW:LEARN Regional Workshops/Conferences), which may be of benefit to project implementation through lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation/execution of similar future projects.

Finally, there will be a two-way flow of information between this project and other projects of a similar focus and use will also be made of the new UNIDO Open Data Platform, to publicize the results of the SAP Implementation Project.

B. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:

B.1 CONSISTENCY WITH NATIONAL PRIORITIES.

Describe the consistency of the project with national strategies and plans or reports and assessements under relevant conventions such as NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, etc.:

Mexico's national strategy has been in line with global agendas on environmental protection. Mexico's National Biodiversity Strategy Action Plan (NBSAP, 2000) in process of actualization has established four strategic lines that will help to accomplish objectives under the Convention for Biological Diversity, placing the preservation of ecosystems among the top national priorities.

The National Development Plan establishes the national objectives, strategies and priorities of the current Mexican administration. It sets forth five national goals and three transversal strategies, which all policies of the Federal Government must include. The five goals are: 1) A peaceful Mexico; 2) An inclusive Mexico; 3) Mexico with quality education; 4) A prosperous Mexico; and 5) A globally responsible Mexico. The transversal strategies are: democratic productivity, a modern government close to its people, and ensure a gender equality perspective. Environmental issues are addressed in the fourth goal, which promotes an inclusive green economy to preserve the country's natural capital while creating wealth, competitiveness and jobs.

The Sectorial Program on Environment and Natural Resources 2013-2018, in line with the National Development Plan, aims at the recovery of watershed functionality through conservation, restoration and

sustainable development of the natural capital in its Objective 4, and takes into account the Aichi Goals. It aims to capitalize on the international agenda focused on ensuring the protection, conservation and sustainable development of the ecosystems, their biodiversity and environmental services. Objective 6calls to develop, promote, and apply policy instruments, information, education, participation, and human rights to enhance environmental governance. Regarding climate change, the enacted General Law on Climate Change points out that the National Strategy on Climate Change (Vision 10-20-40) will be the main environmental policy instrument so that Mexico can transition into a sustainable, low-carbon emissions economy within 10, 20 and 40 years.

To consolidate the national policy on climate change, the Special Program on Climate Change 2014-2018 groups 14 sectorial programs seeking to reduce greenhouse gas emissions and incorporate adaptation and mitigation measures. It addresses the reduction of population's vulnerability in risk areas, preservation of ecosystems, reduction of greenhouse gas emissions, and pollutants of short life by working with major emissions sectors, such as transport, oil, gas, industry, agriculture, electricity and waste.

Mexico's National Strategy on Invasive Species helps to determine the priority actions that must be taken to address this issue in a coordinated fashion among all sectors, from the government to the civic society. Such actions will aid in consolidating a narrative that puts a higher value on the biological biodiversity of the GoM LME, promoting the generation of solutions to face invasive species and their impacts, and preventing the introduction of non-native species and the dispersion of the already established ones. The success of its implementation will require engagement and integration of legal instruments, generation of knowledge, and active participation of the civil society.

The National Strategy on Mangrove Ecosystems aligns policies and programs of the federal government with a nation-wide, transversal approach to guide its activities in the coastal environment in order to achieve protection of mangrove ecosystems, prevent ecosystem depletion, and generate alternative sustainable production, promote mangrove structure restoration, function and coverage with direct and ongoing participation of the civil society.

SEMARNAT is the administrative authority responsible for most environmental issues under federal jurisdiction, and has delegations in each state for handling federal issues; hence it is the implementing partner for this project. Under the General Law of Wildlife, which establishes the regulations for species listed under the Official Mexican Standard NOM-059-SEMARNAT-2010, Mexico directs its national strategy towards the environmental protection of native species, including marine and coastal ecosystems. In context with the past projects on mangrove forests restoration, the Official Mexican Standard provides special protection to endangered species as a consequence of human activities, such as the Gulf of Mexico mangroves. In addition, the Official Mexican Standard NOM-022-SEMARNAT-2003 establishes specifications for the preservation, conservation, sustainable use, and restoration of coastal wetlands in mangrove areas, in line with the objective of this project.

In the United States an extensive array of federal laws supports the protection and restoration of ecosystems. In the context of water quality and protection of marine ecosystems, the United States has a developed national strategy, including various agencies, private and public stakeholders, and designated implementing institutions. The Clean Water Act as the major federal environmental law on water quality improvement provides a comprehensive framework of standards, technical tools, and financial assistance to address the many causes of pollution and poor water quality, including municipal and industrial wastewater discharges, and habitat destruction.

The current project has been developed fully in line with the Strategic Action Program, which has been endorsed by both countries. Therefore it is fully in line with the latest regional and national priorities. This Strategic Action Program (SAP) is a policy document negotiated by the governments of the United Mexican States (Mexico) and the United States of America (U.S.) through the coordination of the appointed Technical National Focal Points to the Gulf of Mexico Large Marine Ecosystem Project (GoM LME), the Secretaria de Medio Ambiente y Recursos Naturales (SEMARNAT) of Mexico and the National Oceanic and Atmospheric Administration (NOAA) of the United States of America. The document outlines the joint strategies and aims

to promote shared policy goals and legal and institutional actions to address priority transboundary problems that have been previously identified by both NOAA and SEMARNAT in the Transboundary Diagnostic Analysis (TDA).

The transboundary elements to be addressed are summarized in Annex 2 of the SAP and include common problems to both countries that require collective action to address, such as: habitat alteration and/or loss, eutrophication and hypoxia, effects from hydrocarbons, pesticides, metals, emergent pollutants and floating marine debris. Other elements identified are overexploitation and overcapitalization of stocks exploited by overcapitalized fleets in both countries, effects of climate change, ecosystem-wide connectivity, inadequacy of the evaluations of ecosystems services, increase information exchange between equivalent agencies, improve information exchange and define joint or harmonized management strategies, establish and implement Ecosystem Based Management in a standardized way within and among countries.

C. DESCRIBE THE BUDGETED M &E PLAN:

Project monitoring and evaluation (M&E) are conducted in accordance with established UNIDO and GEF procedures. The M&E activities are defined by Project component 4 and the concrete activities for M&E that are specified and budgeted in the M&E plan.

Monitoring will be based on indicators defined in the strategic results framework (which details the means of verification), and the annual work plans. Monitoring and Evaluation will make use of the GEF Tracking Tool, which will be submitted to the GEF Secretariat three times during the duration of the project: at CEO Endorsement, at mid-term review, and at project closure.

UNIDO as the Implementing Agency will involve the GEF Operational Focal Point and project stakeholders at all stages of the project monitoring and evaluation activities in order to ensure the use of the evaluation results for further planning and implementation. According to the Monitoring and Evaluation policy of the GEF and UNIDO, follow-up studies like Country portfolio evaluations and thematic evaluations can be initiated and conducted.

All project partners and contractors are obliged to (i) make available studies, provide reports or other documentation related to the project and (ii) facilitate interviews with staff involved in the project activities.

Effective monitoring and evaluation (M&E) is widely accepted as an indispensable tool for effective project and program management. The M&E plan, in accordance with GEF guidelines, will serve both a corrective function during the project cycle, enabling timely adjustments, and as a guide to structuring future activities effectively.

M&E Activity Categories	**Feeds Into**	**Time Frame**	**GEF Budget (USD)**	**Responsible Parties**
Monitoring of project impact indicators (as per LogFrame)	Project management	*Continuous*	39,600	PMU
Periodic Progress Reports	Project management; SCM Meetings	Semi-annually		
Mid-term review/ evaluation	Project management; SCM	At project mid-term	36,000	UNIDO PM, PMU, UNIDO Quality Monitoring Division and

				evaluator
Independent terminal evaluation	Terminal Evaluation Review (TER) conducted and TOR for evaluation drafted by UNIDO EVA.	Project completion	48,000	Independent evaluator, PMU, UNIDO PM, and UNIDO Evaluation Group
TOTAL			123,600	

The first activity, and baseline for project monitoring, will be established by the Inception Workshop, which will be conducted with the full project team, relevant government counterparts including the 7 national Executing Agencies, FAO as provider of technical assistance, key stakeholder group representatives, and UNIDO. The principal objective of the Inception Workshop, which will be led by UNIDO, is to provide clear and detailed information in such a form and manner as to allow and encourage the principal stakeholders to assume full ownership of the project. The second objective, once ownership has been demonstrated will be the consensual preparation of the first Annual Work Plan (AWP). This exercise will require an in depth review of the logframe (indicators, including gender disagregated ones, means of verification, assumptions), to impart additional detail as needed, and on the basis of this exercise the AWP for year 1 of the Project will be finalized to guide the delivery of activities. This AWP will include detailed, clear and measurable performance indicators, and will be developed in a manner consistent with the expected outcomes of the project. The AWP and updated logframe will be submitted to the GEF Secretariat within the first six months of implementation of the project.

Additionally, the Inception Workshop will: (i) introduce the project staff and Executing Agencies to UNIDO and SEMARNAT staff working on the project; (ii) detail the roles, support services and complementary responsibilities of UNIDO and SEMARNAT staff vis-à-vis the project team; (iii) provide a detailed overview of UNIDO reporting and, monitoring and evaluation (M&E) requirements, with particular emphasis on the Annual Project Implementation Reviews (PIRs), IW Results Templates and related documentation, as well as mid-term and final evaluations.

The Workshop will also provide an opportunity to train the project team regarding UNIDOs project related budgetary planning mechanisms (SAP), budget reviews, and mandatory budget reprogramming. The Workshop will finally provide an opportunity for all parties to take stock of their roles, functions, and responsibilities within the Project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff and Executing Agencies could for example be further explained, as/if required, in order to clarify responsibilities and obligations.

A detailed schedule of project review meetings will be prepared by the PMU, in consultation with project implementation/execution partners and stakeholder representatives, and will be incorporated into the Project Inception Report. This will include: (i) proposed time frames for Steering Committee Meetings, and relevant advisory and/or coordination mechanisms, and (ii) project related Monitoring and Evaluation activities.

Day to day monitoring of overall project implementation progress and of progress in the execution of activites by the designated national Executing Agencies will be the responsibility of the Project Coordinator based on the project's AWP and its indicators. The Coordinator will inform UNIDO of any delays or difficulties faced during implementation to ensure that appropriate support and/or corrective measures can be adopted in a timely and remedial fashion.

The Coordinator and UNIDO will fine-tune the progress and performance/impact indicators of the project in consultation with the full project team during the Inception Workshop. Specific targets for the first year, and measurable progress indicators and means of verification will be developed at this Workshop and will be used to assess implementation progress, and/or will trigger a correction if delays/challenges are met. Targets and indicators for subsequent years will be defined annually, as part of the internal evaluation and planning processes undertaken by the project team and will be reflected in the AWP.

Measurement of impact indicators related to global benefits will take place as per schedules defined during the Inception Workshop and tentatively outlined in the indicative Impact Measurement Template (IW Tracking Tool). The measurement of these will be undertaken through subcontracts or retainers with relevant institutions, and will be covered through specific studies/reports resulting from project activities.

UNIDO's Office in Mexico (UOM) will conduct yearly visits to a sample of the project's field sites to assess first-hand progress, or more often based on an agreed schedule to be detailed in the project's Inception Report / Annual Work Plan. Any other member of the Steering Committee can accompany UOM, as decided by the Steering Committee. A Field Visit Report will be prepared by UOM and circulated no less than one month after the visit to the project team, all Steering Committee members, and the UNIDO project management staff.

Annual Monitoring will be reviewed and validated during the yearly Steering Committee Meetings (SCM). This is the highest policy-level meeting of the parties directly involved in the project's implementation/execution. The first such meeting will be held within the first twelve months of the start of full implementation. UNIDO's project management staff will prepare a Project Implementation Review (PIR – see details below) and submit it for review and comments at the SCM.

The harmonized PIR will be used as one of the basic documents for discussions in the SCM. UNIDO's project management staff will present the PIR at the SCM, highlighting policy issues and recommendations for the decision of the SCM participants. UNIDO's project management staff will also inform the participants of any agreement reached by stakeholders during the PIR preparation on how to resolve operational issues. Separate reviews of each project component may also be conducted if necessary.

The final Steering Committee meeting will be held in the last month of project operations. UNIDO project management staff will prepare the Final Project Report (FPR), in draft at least two months in advance of the final SCM in order to allow for its review; it will serve as the basis for discussions. The final SCM will consider the implementation of the project as a whole, paying particular attention to achievement of stated objectives and contribution to the broader environmental objective. It will decide whether additional actions are still required, particularly in relation to ensuring sustainability of project results, and will act as a vehicle through which lessons learnt can be captured to feed into other projects under implementation of formulation (feeding into the ODG/EVA evaluation processes as well).

Project Monitoring Reporting

The Project Coordinator in conjunction with UNIDO's project management staff will be responsible for the preparation and submission of the following reports that form part of the monitoring process.

The Inception Report (IR): A Project Inception Report will be prepared immediately following the Inception Workshop. It will include a detailed First Year/ Annual Work Plan divided into quarterly timeframes detailing the activities and progress indicators that will guide implementation during the first year of the project. This Work Plan will include the dates of specific field visits, support missions from consultants or UNIDO, as well as timeframes for meetings of the project's decision-making structures. The Report will also include the detailed project budget for the first full year of implementation, prepared on the basis of the Annual Work Plan, and will include any monitoring requirements to effectively measure project performance during the targeted 12 months time-frame.

The Inception Report will include a more detailed narrative on the institutional roles, responsibilities, coordinating actions and feedback mechanisms of project related partners. In addition, a section will be

included on progress to date on project establishment and start-up activities and an update of any changed external conditions that may effect project implementation.

When finalized, the report will be reviewed by UNIDO's project management staff and will then be circulated to project counterparts who will be given one month in which to respond with comments or queries.

The Project Implementation Review (PIR): The PIR development process is an annual monitoring process mandated by the GEF that will be managed by the PMU. It is an essential management and monitoring tool for project managers and offers a powerful tool to assess progress and extract lessons from ongoing projects. The PIR process will come into effect once the project has been under implementation for one year. The PIRs will provide a key input to the Steering Committee meeting and will reflect progress achieved in meeting the project's Annual Work Plan and to assess performance of the project in contributing to intended outcomes through outputs and partnership work. The format for the PIRs will include the following:

An analysis of project performance over the reporting period, including detailed information on Activities in support of delivering the expected Outputs, and if/when possible, information on progress towards achieving the expected Outcome;
The challenges/obstacles encountered in delivery of results and reasons for these;
Annual Work Plans (AWP) and other expenditure reports (Enterprise Resource Planning (ERP) generated);
Lessons learned;
Clear recommendations to address key problems in cases where progress has not been as expected;
The GEF International Waters Project Performance Results Template.
The focal area PIRs are discussed in the GEF Interagency Focal Area Task Forces in or around November each year and consolidated reports by focal area are collated by the GEF Independent M&E Unit based on the Task Force findings. The GEF M&E Unit provides the scope and content of the PIR.

Project Final Report: During the last three months of the project the PMU will prepare the Project Final Report. This comprehensive report will summarize all activities, achievements and outputs of the project, lessons learnt, objectives met or not achieved, structures and systems implemented, etc. and will be the definitive statement of the project's activities during its lifetime. It will also present recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's activities. It will be submitted to the terminal TPR for review by its participants.

Project Publications: Project Publications can form a key method of crystallizing and disseminating the results and achievements of the project. These publications may be scientific or informational texts on/from the activities and achievements of the project, in the form of journal articles, flyers, multimedia publications, reports, etc. The project team will determine if any of the documents merit formal publication, and will also (in consultation with UNIDO, the government and other relevant stakeholder groups) plan and produce these publications in a consistent and recognizable format.

Co-financing Reports: The PMU will be responsible for collecting the required information and reporting on in-kind and cash co-financing provided by all co-financing partners included, as well as other unplanned sources (partners not foreseen at the time of project design). The report will be incorporated into the annual PIR.

GEF-5 IW Tracking Tool: In accordance with GEF policies and procedures, the tracking tool for the IW focal area will be submitted in three stages: (i) with the project document at CEO endorsement; (ii) at the time of the project's mid-term review; and (iii) with the project's final evaluation or final completion report. At project mid-term and end, the tracking tool will be completed by the PMU in close consultation with National Co-executing Agencies.

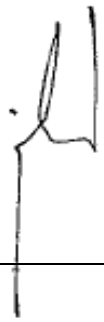
D. LEGAL CONTEXT:

The Government of the United Mexican States agrees to apply to the present project, mutatis mutandis, the provisions of the Revised Standard Technical Assistance Agreement concluded between the United Nations and the Specialized Agencies and the Government on 23 July 1963 and as amended on 28 August 1968.

PART III: CERTIFICATION BY GEF PARTNER AGENCY(IES)

GEF Agency(ies) certification

This request has been prepared in accordance with GEF policies[55] and procedures and meets the GEF criteria for CEO endorsement under GEF-6.

Agency Coordinator, Agency Name	Signature	Date (MM/dd/yyyy)	Project Contact Person	Telephone	Email Address
Philippe R. Scholtès, Managing Director Programme Development and Technical Cooperation (PTC), UNIDO GEF Focal Point		10/07/2016	Christian Susan, Industrial Development Officer, Industrial Resource Efficiency	+43 1 26026-3541	c.susan@unido.org

[55] GEF policies encompass all managed trust funds, namely: GEFTF, LDCF, and SCCF

Annex A: Project results framework

(either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

INTERVENTION LOGIC		OBJECTIVELY VERIFIABLE INDICATORS	BASELINE	TARGETS (End of Project)	SOURCES OF VERIFICATION	ASSUMPTIONS
Component 1	**Improve water quality**					
Goal	**Improved water quality through EBM approaches**					
Outcome	**Water quality improved using pollution reduction measures through ecosystem based management approaches (EBM)**					
Output 1.1	Water pollution indicators assessed and water quality monitoring mechanisms reinforced	Comprehensive Spatial Analysis and Technical Assessment Report supported the selection of intervention sites, as well as process of selection of industries (under 1.3) Number of pollution hot spots identified in the 4 priority catchment areas Number of measuring stations and waste water treatment plants identified Institutional capacity gaps in support of effective implementation of the revised Official Mexican Standards (PROY-NOM-001-SEMARNAT-2015 for monitoring wastewater discharges) assessed and measures put in place to bridge these through targeted measures in at least 8 monitoring stations and 8 waste water treatment plants State wide strategy for Gulf up-scaling implemented Equipment (a mobile laboratory unit and an analytical buoy) deployed, operational and maintained by trained staff provide reliable and periodic data Periodic monitoring results support preparation of Bi-yearly water quality reports Water quality monitoring institutions have introduced gender mainstreaming	For the 4 priority catchment areas no information is available on the location of pollution hot spots. Pollution loads and spatial distribution of pollution loads in the receiving water bodies is unknown No information is available regarding which of the existing monitoring stations are the most relevant and/or representative to monitor water quality in the pollution hot spots Institutional capacities and equipment of the existing monitoring stations and the waste water treatment plants are insufficient to comply with the requirements of the revised version of the Official Mexican Standards (PROY-NOM-001-SEMARNAT-2015) for wastewater discharges No reports on the changes of water quality in the pollution hot spots are available (improvements / degradation) The role women play in institutions entrusted with the monitoring of waste water and industrial discharges has not been assessed nor have actions been implemented bridge the gaps	Comprehensive spatial analysis of the location of pollution sources, of pollution loads and of pollution load distribution completed. Technical Assessment Report reviewing, evaluating and ranking the most relevant monitoring stations completed; As a result, 4 Priority intervention hot spots identified in the four priority catchment areas Existing water monitoring stations evaluated and ranked in terms of their relevance to monitor water quality in the hot spot areas in the 4 priority catchment basins; as a result, a minimum of 8 of the most relevant monitoring sites and 8 most relevant wastewater treatment plans (2 per hot spot) identified for intervention. Expected average reductions of 15%for BOD_5, N and P with a minimum 10% reduction of water used by industries involved in the project Institutional capacity reinforced and equipment needs bridged through trainings equally targeted at male and female staff and priority laboratory equipment (mobile measuring station and analytic buoy) to implement the revised Official Mexican Standards (PROY-NOM-001-SEMARNAT-2015) for wastewater discharges operational Building on the regularly obtained monitoring information, 8 reports on water quality changes in the hot spot areas prepared by IMTA (2 reports per year starting in year 2 of project implementation) Role of women in water quality monitoring institutions assessed, gender is mainstreamed into their operations and measures to achieve better gender balance among male and female staff members identified and action plans implemented	Reports prepared by the national executing partner IMTA: Comprehensive spatial analysis report (location and distribution of pollution loads in the 4 priority catchment areas) identifying pollution hot spots Technical assessment report (verifying, evaluating and ranking the most relevant monitoring stations and most relevant waste water treatment plants) identifying their training and equipment needs Gap analysis report verifying and analysing gaps in currently monitored water quality parameters for full compliance with the revised version of the Official Mexican Standards (PROY-NOM-001-SEMARNAT-2015) for wastewater discharges Draft and validated final assessment report prioritizing additional parameters to be measured in line with the revised standard and presenting options, mechanisms and challenges to ensure their sustainable implementation and replication throughout the Gulf States Report on training of CONAGUA staff in O&M of the priority analytical equipment (to be provided by supplier) Regular monitoring dtat and reports on water quality in the priority catchment areas Report on situation and role of men an women in water quality monitoring institutions and proposals made to enhance gender balance, gender disaggregated information on participation in training activities	The revised version of the Official Mexican Standards (PROY-NOM-001-SEMARNAT-2015) for wastewater discharges at the regional level (Including Gulf of Mexico States), enter into force at the end of 2016 Institutions involved in water quality monitoring actively cooperate in gender mainstreaming and encourage a gender balanced attendance in training activities

INTERVENTION LOGIC		OBJECTIVELY VERIFIABLE INDICATORS	BASELINE	TARGETS (End of Project)	SOURCES OF VERIFICATION	ASSUMPTIONS
				Gender balance achieved as regards the training and capacity building measures implemented as a result of project interventions		
Output 1.2	Dialogue between government and industry strengthened	industries pre-selected in the priority hot spots based on the data review and definition of key selection criteria Industrial pollution reduction priorities validated through public-private dialogue TEST methodology introduced The role of women entrepreneurs and female decision makers in industry and the public sector is strengthened	No information readily available regarding emissions from industries and relative contribution to pollution loading in the hot spots No information available to determine which industries would obtain the most significant pollution and water use reductions as a result from linkages with the public sector and from the TEST methodology trainings Public and private sector do not communicate on pollution reduction challenges, pollution reduction perspectives and pollution reduction priorities; no pollution policy recommendations are developed through participatory public-private sector dialogues Decision makers in industry have limited awareness of the economic and environmental benefits that can result from adopting resource efficient cleaner production processes and environmentally sound technologies Limited focus on women entrepreneurs and the role of female decision makers in industries and public sector	Industries most likely to obtain significant results from linkages with the public sector and the TEST methodology trainings are identified, ranked and pre-selected using data from monitoring stations (1.1 above), information on types and location of industries, waste water discharge volumes, pollution loads and water allocation permits At least 200 industry and government representatives (50 from each pollution hot spot and with equal gender distribution) have participated in a 3 day workshop facilitated and moderated by NCPC-TU to verify and assess pollution reduction topics and to provide their respective perceptions and inputs into a pollution policy recommendation At least 320 industry representatives with equal gender distribution will have been sensitized through eight 1-day workshops (2 in each pollution hot spot) to the economic and environmental benefits of applying the TEST methodology Gender balanced participation in information and training workshops promoted and women's job skills improved	Reports to be provided by the national executing partner NCPC – TU: Report on industries verified, ranked and preselected in the four pollution hot spots in line with their potential for pollution reduction through linking with the public sector and benefitting from TEST trainings Report on the 4 three day workshops to be organized by NCPC-TU in each of the pollution hot spots for representatives from the private and the public sector Draft policy recommendation to tackle pollution reduction provided to SEMARNAT Reports on 8 sensitization workshops (2 in each hot spot area) each for at least 40 participants including questionnaire based information documenting measurable improvement in womens job skills Gender disaggregated data on participants from industry and public sector in trainings and workshops	Industries realize that their emissions will have to comply with the provisions of the revised version of the Official Mexican Standards (PROY-NOM-001-SEMARNAT-2015) for wastewater discharges and are ready to make adaptations in their production processes and to reduce their waste water emissions Industries and government institutions are willing to cooperate on gender mainstreaming and support a gender balanced participation in the training workshops to be organized through the project.
Output 1.3	UNIDO TEST methodology implemented in in the four priority hot spots identified in the SAP (Papaloapan, Coatzacoalcos, Panuco, and Grijalva-Usumacinta rivers- the latter including the Laguna de Terminos)	Intervention sites and 50 of the industries with the highest pollution emissions selected TEST methodology tools implemented in 50 industries, BOD5, N and P emissions by industries to water bodies reduced by 15%, industrial water consumption reduced by at least 10%. Results disseminated Role of female management and key technical staff will be promoted	Industries are not aware of the financial benefits that can accrue from adopting resource efficient cleaner production processes and are not committed to engage with the NCPC-TU No tailor made training manuals and materials are available to meet the needs of at least 50 industries with the highest pollution emissions to adopt resource efficient cleaner production approaches and environmentally sound technologies Top management and key technical staff in industries do not know about the financial implications of inefficient resource utilization in production processes, baseline in unknown Top management and key technical staff do	At least 50 of the industries with the highest pollution emissions have committed in writing that they are willing to cooperate proactively with the NCPC-TU on the application of TEST methodology on a voluntary non-remunerated basis and agree that results can be showcased at the end of the project Tailor-made training materials and manuals developed and discussed with at least 50 industries through 4 inception workshops (one in each hotspot location) Top management and key technical staff in at least 50 industries are fully aware of the financial costs of inefficiencies in production processes, baseline is defined Top management and key technical staff of	Reports provided by the national executing partner NCPC – TU: Report on the process to select at least 50 of the industries with highest pollution emissions including the commitment letters form at least 50 industries and a ranking of these industries based on their water consumption and waste water discharge Report on training materials and tools developed Report on targeted trainings and assessments on the 5 TEST tools carried out in each of the 50 participating industries (1 general training per project hotspot site, followed by individual trainings and assessments in each	As a result of the public-private dialogue and the sensitization activities industries realize that the adoption of resource efficient cleaner production processes and of environmentally sound technologies will not only allow them to comply with more stringent environmental standards but will also result in enhanced company efficiency and financial savings and are prepared to dedicate time, human resources and venture capital to the implementation of the

INTERVENTION LOGIC		OBJECTIVELY VERIFIABLE INDICATORS	BASELINE	TARGETS (End of Project)	SOURCES OF VERIFICATION	ASSUMPTIONS
			not know about financial saving potential resulting from the application of resource efficient cleaner production processes and environmentally sound technologies and make no investments into resource efficient cleaner production and environmentally sound technologies Decision makers in governmental institutions and in other but the at least 50 industries trained in the application of the TEST methodology are unaware of the economic and environmental improvement potential the application of the application of resource efficient cleaner production processes and environmentally sound technologies can bear, information on the benefits of the application of the TEST methodology are not disseminated and TEST is not scaled up Gender balance for top management staff and key technical experts in industries is not understood to be a priority	both genders in at least 50 industries informed about the Return on Investment and environmental impacts reductions resulting from the adoption of industry specific resource efficient cleaner production and environmentally sound technologies and make investments in resource efficient cleaner production and environmentally sound technologies resulting in improved industry profitability and reduced environmental impacts, financial savings, pollution load reductions and water/energy savings are quantified Pollution loads are measurably decreased, and over time improvements in the health of the ecosystem are documented Fact sheets on achieved TEST results developed and presented in at least one seminar in each of the hot spot areas to at least 320 (160 male and 160 female) decision makers from governmental institutions and industries which did not benefit from the TA provided by the NCPC-TU for the application of the TEST methodology. In these seminars the direct exchange between industries that participated and industries that did not yet engage with NCPC-TU will be facilitated. These seminars will widely disseminate information on the financial savings and environmental impact reductions that could be achieved and support and promote the up-scaling and replication of TEST to other industries further contributing to improved ecosystem health Gender equality is understood as a priority, gender balanced participation of top management and key technical staff in the implementation of the TEST methodology actively promoted.	individual industry) Inception report setting up the baseline indicators for at least 50 industries as well as the lining out the trainings foreseen for each industry. Report on the recommendations and detailed workplan on the implementation of the 5 TEST tools (no cost, low cost and cost recommendations) prepared and provided to each of the 50 participating industries and Return on Investment for each of the recommendations determined and documented 6 monthly progress reports and final report quantifying the financial savings, pollution load reductions, water and energy savings the application of resource efficient cleaner production processes and adoption of environmentally sound technologies has resulted in each of the at least 50 industries as well as in aggregated form 2-page factsheets available in e-format and printed versions for each of the at least 50 industries documenting and showcasing the environmental (pollution reduction) and economic benefits attained by applying the UNIDO TEST methodology Report on dissemination seminaries and on up-scaling activities Report on activities undertakbe to assure gender balance and gender disaggregated data of top management and key technical staff trained in the application of the TEST methodology	TEST methodology Female top management and key technical staff identified and top management of industries committed to support gender mainstreaming in trainings for the application of the TEST methodology
Output 1.4	Environmental Monitoring Programme implemented	Coastal conditions monitoring programme established including collaborative agreements with existing and /or upcoming information systems	Coastal lagoon, beach areas and ocean water quality data collected by different institutions is sub-optimally coordinatied, data sharing and exchange does not take place in a systematic way Representative monitoring sites where data and information required to determine the Coastal Condition Index (an index with modules on Water, Sediment, and Fish Quality, Habitat Degradation and Benthic Quality developed during the SAP	A cooperation agreement on coordination and systematic data sharing with SEMAR (Mexican Ministry of the Navy), the National Institute of Ecology and Climate Changes (INECC) and the Veracruz Reef System Park is established 6 representative monitoring sites identified and comprehensive monitoring campaigns, as required to calculate the Coastal Condition Index, carried out in years 2, 3 and 4 of project implementation	Reports provided by the national executing partners CINVESTAV and CONABIO: CSigned cooperation agreement establishing coordination and data sharing mechanisms with SEMAR, INECC and the Veracruz Reef System Park (CINVESTAV) Report submitted to SEMARNAT detailing the proposed monitoring	The national Mexican institutions involved in the collection and analysis of data on the environmental status of coastal areas (SEMAR, INECC, the Veracruz Reef Parks System, CENAPRED, COFEPRIS, CONAGUA, and IMTA) maintain their willingness to cooperate, exchange date and the

INTERVENTION LOGIC		OBJECTIVELY VERIFIABLE INDICATORS	BASELINE	TARGETS (End of Project)	SOURCES OF VERIFICATION	ASSUMPTIONS
			development project, which ensures comparability of data collected in Mexico with the National Coastal Assessments carried out by US Environmental Protection Agency - EPA, US National Oceanic and Atmospheric Administration - NOAA and the US Geological Survey USGS) are unidentified; coordinated monitoring of the required data does not take place Publicly available data on the environmental status of coastal areas are dispersed across different institutions and not easy to access No early warning system for environmental and water related health parameters (Harmful Algae Blooms HABs) is in place No integrated environmental monitoring system is in place to inform decision making in Mexico, Communication between stakeholders form relevant institutions is weak and not systematically organized and transboundary integration with the US is weak	A three-day training workshop for at least 40 participants (20 male and 20 female) each organised in each of the years 2 to 5 of project implementation; as a result analytical capacities of the National Centre for Disaster Prevention (CENAPRED), the Federal Commission for the Protection of Sanitary Risks (COFEPRIS), CONAGUA, IMTA and SEMAR are measurably strengthened A one-stop web-based platform for on-line environmental and health related parameters is operational An early warning system for HABs is established A cross institutional on-line platform to share information from the SEMARNAT databases in real time with other existing platforms is established. Data interchange between Mexican Institutions (COFEPRIS health laboratories and the Institute of Remote Marine Sensing, University of South Florida) is facilitated and strengthened by 2 two day workshops for a minimum of 15 male and 15 female participants each	activities and timelines. (CINVESTAV Six-monthly progress reports on the implementation of the monitoring programme (including data and results) Reports on Coastal Condition Index including geo-referenced colour-coded maps prepared in years 2,3,and 4. Final report analysing trends in the development of the Coastal Condition Index and including data comparisons with the National Coastal Assessments (US EPA, US NOAA, US GS) prepared in year 5. Mailing lists and related evidence documenting wide dissemination of these reports to environmental managers and stakeholders. (CINVESTAV) Report on expert meetings to assess and select the priority parameters and to establish mechanisms to determine trigger levels for EWS (CONABIO) CONABIO webpage (web based HAB system) online and regularly maintained Report on the establishment of the Early warning system (CONABIO) Report on design and roll-out of a cross institutional information system to share information from the SEMARNAT databases with other existing platforms (CONABIO) Number of visits to the sites Reports on 2 workshops (CONABIO)	high level of ownership which they demonstrated during the PPG phase Co-financing pledges will be maintained to ensure sustainability of these efforts beyond project closure (as part of the responsibilities of the relevant agencies)
Component 2	**Avoid depletion and recover living marine resources (LMR - Fish and shellfish)**					
Goal	**Recovery of LMR**					
Outcome	**Rebuilding of targeted fish stocks is achieved through implementation of measures, such as update of regulatory framework and enforcement, capacity development, and monitoring**					
Output 2.1	Joint stock assessment implemented	Existing data pooled and accessible Bilateral Assessment Team established and stock to be assessed (king mackerel or Atlantic Spanish mackerel) selected	Information on little Scombrids (Scomberomorus Sp.) is scattered across various Mexican Institutions, data are not used systematically for scientific analysis applying the format followed by US NOAAs Southeast Data Assessment and Review	The entire transboundary stock of Spanish mackerel of the Gulf of Mexico is known and monitored to produce inputs for sustainable fisheries The main threats of overexploitation of the	Reports of the national executing partner INAPESCA Core group report on existing data using the CEDAR format	Both countries maintain their readiness to cooperate on a joint stock assessment

INTERVENTION LOGIC		OBJECTIVELY VERIFIABLE INDICATORS	BASELINE	TARGETS (End of Project)	SOURCES OF VERIFICATION	ASSUMPTIONS
		Joint stock assessment conducted Assessment is validated through a peer review process Joint Stock Assessment report is published and results reflected in official publications (Federal Gazette) Gender balance assured for the positions supported by the project and the experts invited to meetings	cooperative process (SEDAR) which hinders transboundary data exchange and comparability Data gaps for little the assessment of little Scombrids stocks are unknown and collaborative opportunities are unexplored. Lack of cross laboratory calibration and lack of formal information exchange processes hinders transboundary data exchange and scientific collaboration No database on INAPESCA website available for little Scombrids Lack of a formal framework for the scientific cooperation between Mexico and the US in transboundary stock assessments, no common format for data collection adopted No formalized and mutually agreed process for the scientific cooperation between Mexico and the US in transboundary stock assessments in place No structures are in place to mobilize buy–in and support from stakeholders, including women, into stock assessment processes No validation processes for joint stock assessments are in place To date the “Sustainability and responsible fishing in Mexico assessment and management report” a publication providing information on the most important fisheries in the country lacks a chapter on small Scombrids The technical sheet for little Scombrids fishery in the National Fisheries Chart which is the Mexican official publication (Federal Gazette) providing information on the status of fisheries resources is outdated	stock of Spanish mackerel in the Gulf of Mexico are identified and recognized by scientists from Mexico and USA Appropriate strategies are discussed and proposed by scientists from Mexico and USA to improve the fisheries management of Spanish mackerel in the Gulf of Mexico Core group of scientists established and existing data on little Scombrids collected, analysed and presented in the CEDAR format. Transboundary data exchange and comparability facilitated Data gaps are identified by the core group of scientists and collaborative opportunities with universities and research groups are identified Transboundary data exchange mechanism and collaboration facilitated by five four day workshops (one per year each for at least 15 scientists from Mexico and the US with equal gender distribution) with focus on cross laboratory calibration and information exchange (focusing amongst others on otolith age determination) A little Scombrids database is designed, rolled out and integrated into INAPESCA’s website, maintained and regularly updated Bilateral Assessment Team (BAT with 5 scientists from INAPESCA and 5 scientist from NOAA) that meets existing CEDAR (US NOOA) standards established. TORs for BAT approved by US NOAA and INAPESCA 5-day joint stock assessment inception workshop organized during which the stock and list of data gaps that will have to be filled will be agreed upon In the first year one 2-day meeting, in the second and third year three 2-day meetings and in the fourth and fifth year two 3-day meetings of the BAT (10 scientists) will be organized A 2-day multi segment Official Launch Workshop for the joint stock assessment organized. Decision makers sensitized in a high level segment and next steps to be	Core group report on data gaps and collaboration opportunities Reports on results of annual four day workshops on cross laboratory calibration and information data exchange for at least 15 scientists from Mexico and the US INAPESCA webpage Report on establishment of the BAT Report on the 5 day stock assessment inception workshop including the agreement on the stock to be assess and on data gaps to be closed Meeting reports of the BAT Report on the multi segment Official Launch Workshop including a report on next steps to be taken in the assessment process Draft Joint Stock Assessment Report Report on peer review process and documentation of the review and validation process from draft to Final Joint Stock Assessment Report Report on the workshop in which the Joint Stock Assessment report will be presented to stakeholders from US and Mexico “Sustainability and responsible fishing in Mexico assessment and management report” National Fisheries Chart Official publication on the “Status of the mackerel fisheries in the GoM” endorsed by NOAA and INAPESCA Gender disaggregated data on the composition of core group of scientists, the Bilateral Assessment Team and the participants to be invited to the meeting to review the Joint Stock Assessment	Data quality and quantity corresponds to the information provided during PPG phase and is sufficient to support an assessment INAPESCA as the national executing partner for this output will pro-actively support gender mainstreaming and ensure an equitable gender balance for the core group of scientists, the Bilateral Assessment Team and the participants to be invited to the meeting to review the Joint Stock Assessment

INTERVENTION LOGIC		OBJECTIVELY VERIFIABLE INDICATORS	BASELINE	TARGETS (End of Project)	SOURCES OF VERIFICATION	ASSUMPTIONS
				taken agreed-upon by the technical segment. A draft joint stock assessment report prepared by the BAT Panel of peer reviewers (representatives from both countries with equal representation of both genders) nominated jointly by US NOOA and INAPESCA. Draft Joint Stock Assessment Report reviewed by expert panel in interaction with BAT for the integration of comments Reviewed results of joint stock assessment officially presented to at least 50 stakeholders (delegates from various institutions from Mexico and the US with equal gender distribution) in a one day workshop New chapter in the “Sustainability and responsible fishing in Mexico assessment and management report”, an updated technical sheet for the little Scrombrids fishery for inclusion in the National Fishery Chart prepared and an official publication on the “Status of the mackerel fisheries in the GoM” endorsed by NOAA/INAPESCA prepared Gender balance achieved amongst the members of the core group of scientists, the Bilateral Assessment Team and the participants to be invited to the meeting to review the Joint Stock Assessment		
Output 2.2	Management plans for the transboundary stock developed (Mexico) /amended (US)	Fishery Management Committee (FMC) for Little Scombrids established Fishery management plan for little Scombrids developed and officially endorsed Gender balance assured for the positions supported by the project and the experts invited to meetings	No FMC for Little Scombrids established and no management plan for little Scombrids exists in Mexico No scientific/technical advisory team nor a stakeholder consultation process is in place for the participatory development of a management plan for Little Scombrids and the consideration of stakeholder inputs into the development process No technical and scientific expertise has been assigned to develop a FMP for Little Scombrids No regulatory framework is in place for the management of the Little Scombrids fishery	Management regime is put in place in Mexico and USA in support of the sustainable exploitation of this species; as a result, at least 21,000 tonnes of Spanish mackerel is caught in a sustainable manner Official agreements between government agencies responsible for fisheries management in Mexico and the US to further improve the management of other transboundary species through cooperation mechanisms based on the experience of Spanish mackerel contribute to recovery of living marine ressources FMC for little Scombrids is established and endorsed by CONAPESCA and State governments according to the General Law on Sustainable Fisheries and Aquaculture	Reports of the national executing partner INAPESCA Report on establishment of the FMC and INAPESCA website (list of members of the FMC, letter of appointment) Report on process to recruit the ED Report on administrative procedures to ensure the transfer of the ED position into CONASCA’s structures (no later than one year after publication of the FMP) 10 Meeting reports (including agenda and list of participants) of the FMC Report on the preparation of the draft	US NOAA will use the results of the joint stock assessment to amend the existing management plan for Little Scombrids in parallel to Mexico’s efforts to develop a FMP for Little Scombrids Budgetary provisions will be made to transfer the positon of the ED for the FMC to INAPESCA Endorsement of management processes by government will be obtained in timely manner

INTERVENTION LOGIC		OBJECTIVELY VERIFIABLE INDICATORS	BASELINE	TARGETS (End of Project)	SOURCES OF VERIFICATION	ASSUMPTIONS
			No systematic gender balance related efforts are undertaken as regards fisheries management	and in line with the model developed by the North Pacific Fishery Management Council Executive Director (ED) of the FMC appointed to oversee the process of preparation of the FMP Regular meetings of FMC as required by law facilitated (a minimum of two 5-day meetings per year each for 20 participants) schedule and documents for these meetings prepared by the ED Technical and scientific advisory team (10 experts from INAPESCA) appointed and facilitated to prepare draft management plan according to Mexican guidelines Three 2-day consultations workshops with fisheries officials from the five coastal states will be organized in 3 different locations (each with at least 15 male and 15 female) participants) to present, review and provide technical inputs in the finalized draft A stakeholder consultation session (2 days for at least 30 relevant stakeholders form public and private sector) held in each of the 5 coastal states of Mexico to present, discuss and obtain feedback from stakeholders for the proposed FMP In line with the provisions of the Mexican laws for public consultation processes the FMP for Little Scombrids is made available to the general public for consultation and comments. The FMP will be considered approved when all observations have been addressed as prescribed by the law for public consultation process Documents complying with administrative and legal requirements prepared by INAPESCA and the final FMP officially submitted to SAGARPA-CONAPESCA The FMP approved by the Federal Commission for Regulatory Improvements (COFEMER) submitted by SAGARPA-INAPESCA to be published in the Official Gazette Gender balance achieved amongst the members of FMC, the technical and	management plan by the technical and scientific advisory team Report on 3 consultation workshops (including agenda, list of participants and results) with fisheries officials from the 5 Mexican GoM costal states Report on the stakeholder consultation sessions (including agenda, list of participants and results) in the 5 Mexican GoM costal states Report on the public consultation process Official submission documents for the FMP from INAPESCA to COFEMER and COFEMER approval documentation Official Gazette of Mexico Gender disaggregated data on the composition of FMC, the technical and scientific advisory team and the public and private sector stakeholders to be invited to the management plan consultation meetings	INAPESCA as the national executing partner for this output will pro-actively support gender mainstreaming and ensure an equitable gender balance for the FMC, the technical and scientific advisory team and the public and private sector stakeholders to be invited to the management plan consultation meetings

INTERVENTION LOGIC		OBJECTIVELY VERIFIABLE INDICATORS	BASELINE	TARGETS (End of Project)	SOURCES OF VERIFICATION	ASSUMPTIONS
				scientific advisory team, and the public and private sector stakeholders to be invited to management plan consultation workshops		
Output 2.3	Technical support for the implementation of already existing management plans for brown Shrimp and red Grouper provided	Fishery Management Committees for brown Shrimp and red Grouper established and operating Effective implementation of existing Fisheries Management Plans supported Fisheries Management Plans disseminated and outreach activities conducted Compliance with and effectiveness of the Fishery Management Plans is monitored Gender balance assured for the positions supported by the project and the experts invited to meetings	Fishery Management Plans for brown Shrimp and red Grouper in Mexico have been developed but not yet implemented No FMCs are in place to drive the implementation of the FMPs for brown Shrimp and red Grouper Synergies with other programmes and projects (e.g. government poverty reduction/social programs and regional fisheries programmes e.g. REBYC II LAC or CLME+) for the implementation of FMPs in line with Ecosystem Based Approach to Management (EBM) and FAO voluntary guidelines for sustainable small scale fisheries (VGSSF) are not explored Lack of targeted capacity building materials for fisheries officials and fisher folks hinders the implementation of the management plans for brown Shrimp and red Grouper Fisheries officials and fisher folks engaged in red Grouper and brown Shrimps fisheries lack information and capacities for the implementation of the FMPs Capacities and resources of fisheries extension officers are insufficient to implement a train the trainers approach as requested for the broad up-take of the FMPs by fishing communities INAPESCA does not dispose of audience appropriate or gender specific didactic materials required for effective outreach activities to fishing communities and no outreach structure has been established to effectively disseminate and implement FMPs in rural fishing communities A lack of feed-back-mechanisms from fisher folks to decision makers hinders the continuous adaptation and improvement of FMPs INAPESCA lacks institutional capacity to monitor compliance or effectiveness of FMPs	At least 40,000 tonnes of seafood (red grouper, shrimp and other fish species) produced in a sustainable manner with ecosystem-based management plans in place. 5,000 small-scale fishermen (re grouper) receive governmental grants to develop sustainable fishing practices in support of the recovery of the ecosystem Red grouper stock rebuilt to at least 80% of B_{MSY} Brown shrimp stock is maintained at B_{MSY} At least ten no-take zones are declared with the participation of fishers 500 artisanal fishermen are engaged in alternative livelihoods, including tourism and aquaculture Children of fishermen seeking other livelihoods than fishing FMCs for brown Shrimp and red Grouper established and endorsed by CONAPESCA and State governments in line with the General Law on Sustainable Fisheries and Aquaculture and in line with the model developed by the North Pacific Fishery Management Council Executive Directors (EDs) of the FMCs for brown Shrimp and red Grouper appointed to oversee the process of implementing the FMPs Regular meetings of FMCs for brown Shrimp and red Grouper as required by law facilitated (a minimum of two 5 day meetings per year each for 20 participants) schedule and documents for these meetings prepared by the ED Gaps and detailed institutional coordination mechanisms with other programmes and projects assessed and steps towards successful implementation of the two FMPs in line with EMB and FAO VGSSF outlined	Reports to be provided by the national executing partner INAPESCA and FAO in its role as a provider of technical assistance: Report on establishment of the FMCs and INAPESCA website (list of members of the FMCs, letter of appointment) (INAPESCA) Report on process to recruit the ED (INAPESCA) 10 Meeting reports (including agenda and list of participants) of the FMC (INAPESCA) Report on administrative procedures to ensure the transfer of the ED positions into CONAPESCA's structures (no later than one year before project completion) Report on potential synergies with other projects and programs e.g. government poverty reduction/social programs and regional fisheries programmes e.g. REBYC II LAC or CLME+) including recommendation s how to capitalize on these use synergies Report on institutional gaps and steps towards successful implementation of the FMPs for brown Shrimp and red Grouper in line with EBM and FAO VGSSF (FAO) Report on the compendium of targeted capacity development materials developed for fisheries officials and fisher folks for FMP implementation (FAO) Reports on 2 capacity building workshops for the implementation of the FMP for red Grouper(FAO) Reports on 2 capacity building workshops for the implementation of the FMP for brown Shrimp (FAO) Report on the training of 5 fisheries	Government of Mexico and fisheries institutions (INAPECSA, CONAPESCA) remain committed to the implementation of the Fisheries Management Plans that were previously developed INAPESCA as the national executing partner for this output will pro-actively support gender mainstreaming and ensure an equitable gender balance for the FMC, and amongst the , the fisheries officials, fisher folks and NGO/CSO representatives to be sensitized and trained in the implementation of FMPs

INTERVENTION LOGIC		OBJECTIVELY VERIFIABLE INDICATORS	BASELINE	TARGETS (End of Project)	SOURCES OF VERIFICATION	ASSUMPTIONS
				Targeted and gender balanced capacity building materials based on international best practice (Ecosystem Approach to Fisheries, VGSSF, Bycatch and discard guidelines,…) for officials and fisher folks developed for the red Grouper fishery in Yucatan and the brown Shrimp fishery in Veracruz Capacities of 20 fisheries officials 40 fisher folks and 40 NGO/CSO representatives of both genders for the implementation of the FMP for red Grouper are strengthened through two 2 days training workshops in Yucatan Capacities of 40 fisheries officials 200 fisher folks and 40 NGO/CSO representatives for the implementation of the FMP for brown Shrimp are strengthened through two 2-day training workshops in Veracruz 5 fisheries extension officers for the red Grouper fisheries and 10 fisheries extension officers for brown Shrimp fishery trained and facilitated to organize at least 10 fishery communities workshops (at least 10 participants) each so that a minimum of 500 grouper fisher folks and 1,000 shrimps fisher folks can be reached and trained in the implementation of the FMPs for red Grouper and brown Shrimp Didactic materials (pamphlets, booklets, posters,…) containing summarized and audience and gender appropriate information, easily understood by fisher folks and other stakeholders developed by FAO reproduced and widely distributed by INAPESCA with the support of local networks, associations, NGOs, CSOs etc. At least 480 small scale fisherfolks, boats owners, community leaders, CSO and NGO representatives (240 male and 240 female) have been reached, sensitized and trained on the implementation of the FMPs for red Grouper and brown Shrimp through 12 one-day outreach workshops (each for at least 40 participants) At least 80 fish traders and fisheries businessmen (40 male and 40 female) will	extension officers for the red Grouperfisheries and 10 fisheries extension officers for the brown Shrimp fishery (FAO) Reports on the extension activities (50 fishery community training workshops for the red Grouperfishery and 100 fishery community training workshops for the brown Shrimp fishery) reaching 500 grouper and 1,000 Shrimp fisher folks (FAO) Report on the of production audience appropriate didactic material and on the distribution activities facilitated by (INAPESCA) Reports on 12 one day outreach and sensitization workshops for at least 480 small scale fisher folks, community leaders, boat owners, CSO and NGO representatives (INAPESCA) Report on four one day outreach and sensitization workshops for at least 80 fish traders and fisheries businessmen (INAPESCA) Report on the design and implementation of the customers satisfaction survey, and success story leaflets (one for fisher folks and (one for the fishery trade/industry) FAO) Report on the application of the GoM adapted fisheries management plan monitoring instrument developed by the CLME and bi-yearly monitoring reports of the impacts of the FMPs for red Grouper and brown Shrimp (INAPESCA) against the baseline at project launch (INAPESCA) Gender disaggregated data on the composition of FMC, the fisheries officials, fisher folks and NGO/CSO representatives trained and sensitized in the implementation FMPs' approval rating among fisher folks and the fishing sector measured by a 'customer satisfaction' survey of FMPs A reviewed and tailored version of the fisheries management plan monitoring system with SMART	

INTERVENTION LOGIC		OBJECTIVELY VERIFIABLE INDICATORS	BASELINE	TARGETS (End of Project)	SOURCES OF VERIFICATION	ASSUMPTIONS
				be reached through four one day outreach workshops (each for at least 20 participants) Gender balance achieved amongst the members of FMC, the fisheries officials, fisher folks and NGO/CSO representatives to be sensitized and trained in the implementation of FMPs	indicators developed by the CLME project piloted in the GoM to monitor the impact of the FMPs for red Grouper and brown Shrimp and bi-yearly impact monitoring reports prepared by the FMCs/EDs	
Output 2.4	FAO Voluntary Guidelines on Small Scale Fisheries implemented	Partnerships to improve data collection and promote research, in support of the reduction of Illegal Unreported Unregulated (IUU) fishing established Gender equality promoted e.g. through technical assistance to post harvest groups and by equitably addressing small scale fisher folks and field officers of both genders Enabling environment and policy for small scale fisheries strengthened Report on status of fishery prepared and measures to protect species implemented accordingly No take zones established and fishing season effectively reduced/closed Documented reduction of the number of artisanal and semi-industrial fishing boats Role of women in fisheries and post harvest activities strengthened, opportunities and barriers analysed Role of women in fisheries development strengthened.	Limited information on practises of artisanal fisher folks available and IUU poorly reflected in the National Fishery Registry While foreseen by law co-management of fishery resources by user groups and government is poorly implemented To date no curriculum for co-management for field officers and fishing community leaders has been developed, no outreach materials are available and CONAPESCA field officers have limited capacities to promote and engage fishing communities in co-management Limited support available for artisanal fisherfolks to identify alternative livelihoods contributes to overfishing an IUU Lack of feedback mechanisms hinders the further development and roll-out of fisheries co-management and insufficient extension services hinder the adoption of alternative livelihoods by artisanal fisherfolks Status of the fisheries system (biological, ecological, socio-economic components) at local scale is unknown A lack of economic incentives (eco labelling) for the adoption of sustainable fisheries encourages IUU fishing activities The role of women and men in fisheries and post harvest activities is inequitable, barriers and opportunities for women to play a stronger role are not systematically analysed To date ecosystem approach to fisheries management not yet applied for red Grouper and brown Shrimp fisheries	The minimum legal size to catch red grouper is enforced and the season closed to fishing effectively protects spawners At least three no-take zones are declared with the participation of fishers to protect red grouper juveniles 200 artisanal and 100 semi-industrial fishing boats withdrawn from the red grouper fishery More than 5,000 small-scale fishers of brown shrimp contribute to control IUU and fishermen comply with regulations, contributing to the recovery of the stocks Baseline report on practices of artisanal fisher folks including IUU in 10 rural fishing communities established and National Fishery Registry adjusted Educational materials (presentations, videos, leaflets etc.) to expose communities to co-management developed and disseminated and a minimum of 600 artisanal fisher folks (300 male and 300 female) in 10 locations sensitized and trained through 3 day workshops on fisheries co-management issues, concepts for participatory fisheries management in 10 communities developed, 200 key change agents (100 male and 100 female) identified and trained in depth on fisheries co-management Curriculum to train field officers and fishing community leaders in co-management developed and a minimum of 100 field officers and fishing community leaders (50 male and 50 female) trained through ten 3 day workshops to guide the 10 communities to play an active role in co-management. A critical gradual path towards co-management developed and	Reports of the national executing partner INAPESCA and FAO Report on artisanal fisher folks socio-economic situation and their fishery practices including IUU aspects (nature, extent, causes) in 10 rural fishing communities prepared and on technical assistance provided to CONAPESCA to reflect them in the National Fishery Registry, (FAO) Report on the educational and training materials for fisheries co-management developed (FAO) Reports on ten 3 days training workshops for at least 600 artisanal fisher folks in 10 communities and on in depth training of 200 key change agents in fishery co-management (INAPESCA) including gender disaggregated data on participants an trainees Reports on at least 40 participatory planning meetings organized by social scientists in which alternative livelihood opportunities were discussed and identified with 10 fishing communities (INAPESCA) Report on customer satisfaction including 2 leaflets of best practice and benefits achieved by applying co-management and supporting alternative livelihoods (FAO) Report on status of the fishery system (FAO) Report on eco labelling assessment for the red Grouperand brown Shrimp fishery identifying eco-label opportunities, benefits and costs (FAO)	Government of Mexico and fisheries institutions (INAPECSA, CONAPESCA) remain convinced that the benefits the implementation of the FAO voluntary guidelines or sustainable small scale fisheries can contribute to the sector to realize its full contribution to food security and poverty eradication and actively cooperate in the execution of the activities under this output. INAPESCA as the national executing partner for one part of this output will pro-actively support gender mainstreaming and ensure an equitable gender balance of the small scale fisher folks changes agents and of the trainees to be invited to the workshops and trainings on fisheries con-management,

INTERVENTION LOGIC		OBJECTIVELY VERIFIABLE INDICATORS	BASELINE	TARGETS (End of Project)	SOURCES OF VERIFICATION	ASSUMPTIONS
				implemented in each community Participatory identification of alternative livelihoods facilitated by social scientist who engage with the 10 communities at least 4 times during the first 2 years A customer satisfaction survey developed and implemented. Results are used as the basis to prepare 2 leaflets on success stories for further dissemination and up-scaling Status of the fishery system (biological, ecological, socio-economic components) at local scale and in regional context is determined Applicable certification schemes for red Grouper and red Shrimp fishery reviewed and stakeholders in 10 communities assisted through a participatory process in under-going the pre-assessment of potential eco-labelling approaches as a first step towards eventual full certification At least 1,000 women empowered and supported in ten 5 days participatory planning workshops to form post-harvest groups and to identify at least 10 community based and women driven concepts to strengthen their participation in fisheries and post harvest activities and to improve nutrition levels and living standards Ecosystem approach to fisheries adopted in 10 fishing communities for red Grouper and brown Shrimp, fishing areas zoned and sites of interest for conservation identified through consultative processes with rural fishing communities and at least 1,000 fisher folks (500 male and 500 female) assisted through 10 five-day participatory planning workshops in the identification of alternative livelihood approaches e.g. ecotourism projects in no take zones	Report on barriers and opportunities for stronger engagement of women in fisheries and post harvest activities (FAO). Reports on 10 women empowerment workshops and on community based women driven initiatives developed to strengthen the role on women in in fisheries and post harvest activities and to improve nutrition levels and living standards (FAO) Report on survey completed during workshops (based on questionnaires developed by Component 3, Output 3.1.2) to obtain information on common practices of households as regards solid waste and waste water Report on proposals prepared for local government to improve public services related to education, security, electric power, sewage, waste water collection, solid waste collection, accountability of public officials, etc. for rural fishing communities Reports on ten 5 days participatory planning workshop to adopt alternative livelihood concepts e.g. community based ecotourism in no take zones (FAO) documenting improvement of women's job skills, startups, or improvement of local businesses, creation of more spaces in civil society for women's participation, Number of women having received training in nutrition, health and formal organization for effective participation in the community	
Component 3	**Conserve and restore the quality of coastal and marine ecosystem through community involvement and enhanced bilateral cooperation**					
Goal	**Improve ecosystem health**					
Outcome	**Improved coastal and marine ecosystem health through the use of EBM**					
Output 3.1	Community	Comprehensive analysis on location	Preliminary list of communities prepared	6 communities for the implementation of the	Reports to be provided by the national	Community level of

INTERVENTION LOGIC		OBJECTIVELY VERIFIABLE INDICATORS	BASELINE	TARGETS (End of Project)	SOURCES OF VERIFICATION	ASSUMPTIONS
	education programmes on domestic waste water and solid waste sources implemented (Note: all activities related to solid waste are funded through co-financing)	and characteristics of communities and preliminary list of intervention sites confirmed Community profiles in support of development of customized education approaches developed Community education programme on solid and liquid waste management developed and implemented Gender balance assured amongst male and female workshop invitees trainees Womens skills improved through training in nutrition, health and formal organization for effective participation in the community Reduced pollution and nutrient loads to the mangroves Accelerated recovery of the mangrove and wetlands cover, resulting in measurable carbon sequestration, and water quality improvement Habitat recovered for ecologically important and /or commercially important fish species Habitat recovered for resident and migratory bird species	during PPG through a multi-stakeholder informal process Baseline (information on wastewater and solid waste generation and management) not available at the necessary detailed level and community entry points/change agents not yet confirmed Existing community education programs and training materials do not match community needs Costal communities, CSOs and municipal authorities do not benefit from outreach and trainings on solid and liquid waste management General awareness on benefits of better solid and liquid waste management in coastal communities hinders a wide range dissemination of best practices and an up-scaling of improved community based water and solid waste management	education programme confirmed using a multi-criteria decision support system and validated by SEMARNAT Baseline determined at the necessary level of detail through the implementation of a participatory survey, at least 360 community representatives in the 6 communities involved through 2 day consultation meetings (special focus will be put on ensuring gender balance of participants and moderators), a minimum of 180 survey questionnaires used to identify at least 40 households which commit to engage in follow-up activities. Current solid and liquid waste management practices assessed in a solid waste generation and characterization and waste water management report, gaps and opportunities for the development of a custom made educational program assessed (community profile and diagnostics) (Note: all activities related to solid waste are funded through co-financing) Tailor made educational and outreach materials developed for 3 target audiences (community representatives, representatives of women and children's associations and public authorities) At least 540 community representatives, representatives of women and children's group and government representatives (270 male and 270 female) trained through three 1 day workshops in each of the communities. Results achieved through the trainings and capacity building measures for improved solid and liquid waste management measured against the baseline (at least 180 randomly selected community members with equal gender distribution interviewed in the target communities in one day evaluation workshops) , success stories identified and used the for production of awareness creation and dissemination materials in support of the widest possible dissemination of information and results to communities in the coastal states of the GoM (Note: all activities related to solid waste are funded through co-financing)	executing partner UADY: Report on the process to confirm the 6 target communities and validation by SEMARNAT Report on the implementation of the participatory survey, the consultation workshops with community members and the signed commitment forms of at least 40 households that will be used as entry points (including gender disaggregated data on particpants) Report on the development of the community education program Solid waste generation and characterization report and waste water management report specifying gaps and opportunities for the development of a customs made community education programme on solid and liquid waste management Report on community and outreach materials (written and graphic materials) developed for 3 target audiences Report on 18 solid and liquid waste management training workshops including on the number of male and female community members trained Report on results achieved, success stories, production of awareness creation and dissemination materials and on dissemination activities	interest to engage in domestic waste water and solid waste management activities remains strong and sense of interest and ownership manifested by the national executing partner will be maintained UADY as the national executing partner will assure gender equity between representative of both genders invited to workshops and trained Pledges from government regarding co-financing will be honoured Improved management practices for solid waste and wastewater in each community are in place and effectively implemented

INTERVENTION LOGIC		OBJECTIVELY VERIFIABLE INDICATORS	BASELINE	TARGETS (End of Project)	SOURCES OF VERIFICATION	ASSUMPTIONS
				A 30% reduction of the discharge of pollutants from solid waste and sewage into the mangroves and wetlands A 30% decrease in the amounts of solid waste handled incorrectly Decreased content of nutrients and other pollutants in wetlands and mangroves and reduction of contaminated mangrove areas Area of mangroves and wetlands restored Local public policies that promote the proper management of solid waste and wastewater and consequently care of mangroves and wetlands are in place		
Output 3.2	Community based wetland restoration in selected sites achieved	Restoration sites are validated Community leadership/ownership is developed and gender balanced; women in particular have been trained and supported in leadership roles Restoration programmes implemented Gender equality amongst community leaders trained and gender equity in distribution of materials to working brigades is assured Mangrove cover is measurably increased (3,000 ha) and hydrological and biological connectivity are measurably improved Positive results obtained during the TDA Development project are replicated Significant, quantifiable and measurable carbon sequestration validated through time series maps prepared by the INECOL	Final selection of restoration sites has not been agreed upon Limited information available on habitat quality and on root causes of habitat degradation To date no coordination mechanisms are in place to facilitate community based mangrove restoration A lack of action plans hinders the mobilization of additional financing in support of the restoration activities Coastal communities and their leaders have no leadership/ownership in restoration activities Hydrologic restoration process developed and demonstrated to be more cost effective under the SAP development project not yet rolled-out To date no site specific restoration programmes exist Organisation structures as required for community engagement in mangrove restoration no yet in place and basic equipment (gum boots, gloves, shovels) not available to communities	A minimum of 6 restoration sites and the resident communities is confirmed through a participatory multi criteria selection process to confirm sites with the highest likelihood of long term success Detailed assessment of habitat quality prepared for 6 restoration sites and forensic ecology methods applied to explore and understand causes for degradation and presented in site specific baseline reports Coordinating Technical Groups established in the 6 restoration sites and facilitated to reach agreements on obligations and responsibilities of stakeholders, co-financing needs identified 6 specific projects and action plans to mobilize additional financing in support of the restoration activities developed for review and approval by co-financing institutions Training materials developed and 120 community leaders (60 male and 60 female) trained through six 3 day workshops in specific restoration techniques for mangroves and other wetlands including in situ field training, evaluation of current environmental restoration activities, site-specific demonstration of methods to prevent or mitigate degradation of coastal habitats, and control of native and invasive species	Reports of the national executing partner INECOL: Synthesis report on process for the final determination of the restoration sites Site specific baseline reports on habitat quality in the 6 restoration sites and on root causes for habitat degradation Report on establishment of Coordinating Technical Groups including agreements on responsibilities and obligations of stakeholders and on co-financing needs Report on specific projects and action plans to mobilize co-financing Report on training materials developed and on the 6 training workshops for community leaders including gender disaggregated data on participants. Report on adaption of the online course and NECOL and CONANP websites Site specific baseline reports for the 6 restoration sites Report on the process to develop and agree on 6 site specific restoration programmes with community leaders/opinion makers in validation workshops Report on the organization of the	Community interest to engage in mangrove restoration observed during the SAP development project and as expressed during the PPG phase continues to prevail INECOL as the national executing partner will mainstream gender into its activities and ensure a balanced distribution of men and women in training workshops and and gender equity in the distribution of working materials. The restoration efforts will have a significant and positive impact in reversing the effects of massive mangrove forest die offs Ecosystem goods and services will be recovered and community involvement will guarantee the sustainable management of mangroves and other wetlannds

INTERVENTION LOGIC		OBJECTIVELY VERIFIABLE INDICATORS	BASELINE	TARGETS (End of Project)	SOURCES OF VERIFICATION	ASSUMPTIONS
				On-line course for community based wetland restoration adopted to integrate small-scale fisheries relevant aspects Site specific baseline reports including GIS thematic maps for the selected restoration sites prepared, natural reference sites identified and field validation of degraded sites Six site-specific restoration programmes (including workplans, and timelines for the execution of restoration activities, data collection and quality control/monitoring , developed, fine tuned and agreed upon with at least 180 community leaders/opinion makers in six day validation workshops Restoration teams organized by the community leaders into brigades, equipped (boots, gloves, shovels etc.) and coached by INECOL Community supported conservation of mangroves and other wetlands—contributies to rehabilitation and conservation of mangrove forests, carbon (re)capture, water quality, and habitat recovery—in support of the increase of local fish populations and subsequent increase of fisheries, and adaptation to climate change	restoration teams including their gender composition and six monthly reports monitoring progress in community based mangrove restoration in the 6 selected sites Monitoring reports on the impact of the restoration efforts on mangrove and wetland cover, water quality (salinity and nutrients), below and aboveground carbon stores, and diversity of indicator species, such as native birds, fish and invasive species	
Output 3.3	Coordination and bilateral cooperation improved through strengthening of networks	Institutions mapped and opportunities for integration identified and followed up Proposals in support of the enhancement of governance capabilities and transformational opportunities developed/implemented	The establishment of an ecosystem based commission for the GoM was intensively discussed during the SAP development project. Given the multitude of existing bilateral agreements for the joint management of the GoM LME countries opted to strengthen institutional capacities for their implementation rather than establishing a transboundary commission	A Bilateral Coordination Group (BCG) with 5 Mexican and 5 US members (5 male and 5 female) established and facilitated to oversee the preparation and endorsement of a comprehensive review of existing agreements and of the institutional solutions/institutional capacities for their implementation A list of prioritized recommendations for action by the PMU identified by the BCG during a four day bilateral meeting Prioritized recommendations acted on by the PMU, including the organization of a series of meetings (on a yearly basis, as funds permit) to explore collaborative opportunities and identify possibilities for cooperation on education and research	BCG cleared report on existing agreements and institutional capacities for their implementation Report on 4 day bilateral meeting by BCG including list of prioritized follow-up actions for the PMU Yearly report by PMU on meetings organized and on collaborative opportunities identified, proposals developed and processes engaged in to support the implementation of priority transformational opportunities	Strong political will to cooperate in the application of an ecosystem based approach to management as manifested in the SAP will be maintained by both countries
Output 3.4	Effectiveness of Marine Protected Areas enhanced by	Continuous identification of transformational opportunities to capitalize on existing strengths in MPA	A MoU between SEMARNAT's CONANP and NOAA's National Marine Sanctuaries to collaborate in the support of the integrated	Coordination strengthened, focal points designated and a bilateral Working Group established, yearly coordination meetings	Official nominations of Focal Points Workshop reports including participation	Mexico and the US remain committed to the implementation of the

INTERVENTION LOGIC		OBJECTIVELY VERIFIABLE INDICATORS	BASELINE	TARGETS (End of Project)	SOURCES OF VERIFICATION	ASSUMPTIONS
	linking them into networks	networks Actions in support of selected MPAs implemented Network of marine protected areas covered by public policies to promote the protection and sustainable use of natural resources from an economic, touristic and food security perspective IUCN criteria converted into indicators to assess the degree of progress in the conservation and management of marine and coastal resources, as well as of the performance of the network of NPA's	management of the GoM's NPAs exists, however further support of coordination is required for the implementation of the draft working program Effectiveness of MPA management plan implementation insufficiently monitored and evaluated, lessons learned not systematically used to improve MPA management plans	facilitated and yearly thematic workshops organized for at least 20 participants (10 male and 10 female) Management plans of 2 representative MPAs selected by the Working Group, effectiveness of the management plans evaluated in two 5 day experts meetings, gaps analysed and recommendations for improvements of MPA management plans delivered to CONANP and US NOAA in a consultative meeting for review, consideration and application in other MPAs Improvement in management of MPAs contributes to the measurable recovery of species that they harbor PMU liaises with CONANP and NOAA and monitors the implementation of the measure identified to improve MPA management plans	lists and gender data available (PMU) Six monthly reports prepared by PMU in years 3,4 and 5 on progress in implementation of the recommendations for the improvement of the management plans of MPAs	MoU on cooperation in the integrated management of the GoM's NPAs and the implementation of the draft working program

Annex B: Responses to project reviews

(from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

UNIDO Responses to Council Review			
		Germany welcomes the PIF and appreciates the aim of promoting a healthy marine ecosystem. The project design is holistic, covering aspects related to water pollution reduction, protection and recovery of marine resources as well as conservation of the local environment. All described instruments have proven to work in projects worldwide. The transboundary approach as well as the envisaged implementation of the FAO guidelines for securing sustainable small-scale fisheries are seen as essential for the project's success.	Component 2 (Avoid depletion and recover living marine resources), which has been redefined as per the GEF SEC recommendation fully supports the transboundary approach by supporting the first transboundary stock assessment for the GoM LME. Furthermore under output 3.3. coordination and bilateral cooperation will be enhanced by strengthening and supporting transboundary networks. Under output 3.4. the effectiveness of Marine Protected Areas will be enhanced by linking them into transboundary networks. FAO involvement in the project has been carefully crafted. As decided by the partner countries FAO will provide technical assistance under an Interagency Agreement (see Annex H) to ensure that the principles promoted through the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries are implemented as broadly as possible and reach, in particular women as broadly as possible. This will facilitate their livelihoods and promote and sustain their long-term contribution to the communities they live in and support, and their essential contributions to society as a whole.
UNIDO Responses to GEF Secretariat Review			
	1	Include detailed information on the loading from the numerous sources of pollution identified and make sure to also have quantifiable output indicators listing the targets for the investments.	Information on pollution loading is provided in section baseline scenario 1.1. Pollution and in the report; Improve water quality (Y. Cachu, 2015 in Annex F)

	2	Please at time of CEO Endorsement include a strong analysis on the main sources of pollution in the GoM. Industrial pollution is a factor, but it seems questionable that cities and non- point agricultural pollution are not major contributors too. If this is the case, they should be taken into consideration towards implementing the SAP successfully. There are actual commitments in the SAP to decrease municipal discharges, which are neither reflected in component 1 or 3, except through constructed wetlands, which seems to primarily target small communities and not major cities.	The analysis of main sources of pollution has been comprehensively addressed in the FSP. Kindly refer to the following chapters: Baseline - Existing challenges – Pollution; Proposed alternative scenario – Component 1: Improve water quality; Annex I – Additional information – Improving water quality Additional supporting information can also be accessed through the following PPG supporting reports: • Improve water quality, GoM SAP Implementation Project (Y. Cachu – 2015); and, • Land based pollution reduction through TEST methodology implementation (Y. Cachu, 2015). As detailed in the document, significant and estimated reductions of pollutant loads are expected through these interventions. Data from CONAGUA's National Water Information System (http://201.116.60.25/sina/) and the Mexican Water Atlas (2007-2013) show that the investment in municipal wastewater treatment has resulted in continuously declining levels of BOD_5 from municipal discharges, but levels of BOD_5 and COD related to untreated industrial discharges have continued to rise with 6.95 million ton BOD_5/year in 2007 compared to 9.95 million ton BOD_5/year in 2013. CONAGUA estimated that in 2014, the treatment ratio for industrial wastewater was 40% lower than for domestic wastewater, even though BOD_5 levels from industrial discharges were five times higher. While the Government of Mexico will continue efforts to improve municipal wastewater treatment and while the US through the Gulf Hypoxia Action Plan (released by the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force) will continue to address agricultural pollution, focusing GEF incremental support on reducing industrial water pollution will result in the biggest marginal benefits in terms of pollution load reduction. This is fully aligned with the six year development plans of the Mexican States of Campeche, Tamaulipas, Tabasco and Veracruz, which all single out the importance of reducing pollution from industrial sources. In the case of Veracruz for example, the 2011-2016 Development Plan (Plan Veracruzano de Desarrollo 2011-2016) states that the 14 most important rivers in this state carry significant levels of pollution due to inadequately treated or untreated industrial

			wastewater discharges. These industrial discharges account for 68% of the volume of treated wastewaters discharged into rivers and streams, and 76% of BOD_5 load (as presented in the report 'Improve Water Quality", Y. Cachu, 2015 in Annex F)
	3	Please expand on criteria for prioritizing the industries at the pilot sites (e.g. Is it realistic to tackle such a broad range of industries? What is the size and relative loads from thee industries - or what are other criteria for selection?) Being a SAP implementation project, clearer indication of the impact of these measures will be needed at endorsement.	Sites for the implementation of the TEST methodology will be confirmed during the first year of the project, and upon completion of this process candidate industries located on these sites will be validated and ranked, based on as large a suite of parameters, including for example reported releases of pollutants to water bodies, water allocation volumes for consumptive use, enterprise belonging to a recognized heavily polluting sector, etc. The motivation and commitment of the industries management is also a critical element, to ensure sustainability in the application of the TEST approach. In addition, during the extensive PPG consultations, processes were also introduced and consulted on, and will be verified during implementation of the UNIDO TEST methodology. For example, a range of intervention options was identified and 2 main approaches were retained: that of a sectorial approach (sugar mills, slaughterhouses, etc.), or one targeting a representative sample of principal industries.
	4	Pilot/demonstration type investments are typical the main focus in foundational activities while SAP implementation may still pilot innovative approaches but is also expected to aim at targets for impact/stress reduction.	GEB targets have been clearly defined during the PPG and can now be found under section 5 Global Environment Objective
	5	Please elaborate a bit on how the demonstrations sites were identified	The 4 intervention watersheds of the Papaloapan, Coatzacoalcos, Panuco, and Grijalva-Usumacinta rivers, including Laguna de Terminos were selected given their size and importance in terms of discharges into the GoM, combined with the fact that they were identified to be pollution hot spots with high loads of industrial pollution, organic pollution, agrochemicals, suspended solids and heavy metals.

			The locations of the mangrove restoration activities were chosen to facilitate the replication and up-scaling of the successful results of activities launched under the SAP Development Project. During the PPG the preliminary localities (potential restoration sites see Activity 3.2.1 validation of restoration sites) were identified using a suite of criteria (natural resource focused: e.g. establish connectivity among presently disconnected coastal water bodies and decrease hypersalinity, opening migration paths for propagules from healthy wetland ecosystems and socio-economic focused: e.g. existence of organized or semi-organized communities, previous experience with mangrove restoration, expressed interest and support of Federal and State authorities, etc.) that will be further refined by INECOL and used for the final selection of a minimum of 6 sites and 6 leading communities
	6	What legal frameworks/legislation will support the on the ground activities? Further, please make sure to link the SAP Implementation to the GPA on LBS and the Protocol under Cartagena Convention.	The SAP Implementation Project will operate under the purview of an extensive policy framework, which includes an Inter Ministerial Commission for the Sustainable Development of Oceans and Coasts (CIMARES) chaired by SEMAR. Please refer to the Baseline Project section of the FSP, under the heading “Policy Framework”. Amongst others: Under component 1 output 1.1 the implementation of the revised version of the Official Mexican Standard (PROY-NOM-001-SEMARNAT 2015) for wastewater at the regional level. This revised standard will address additional parameter. (see output 1.1 for more detailed information) . Under component 1 Output 1.3. Implementation of the UNIDO TEST methodology industries will be provided the necessary assistance to comply with this more stringent standard by applying resource efficient and cleaner production. This is supported by the six year Development Plans for the States of Campeche, Tamaulipas, Tabasco, and Veracruz, which all single out the importance of reducing pollution from industrial sources. On the ground activities under Component 2 will be supported by the following legislation (more details are provided in the Report ‘Promoting Sustainable Fisheries in the GoM LME, A. Hernandez, 2015): In the US Magnuson-Stevens Fishery Conservation and Management Act of 1976 and the US Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (2006) created legal

			standards that fishery management plans must comply with. The General Sustainable Fisheries and Aquaculture Law (2007) has introduced Fisheries Management Plans in Mexico. This will support the activities to be implemented under component 2 output 2.2 Develop (Mexico)/Amend (US) management plans and activities to be implemented under component 2 output 2.3 technical support to implement already existing management plans. SAP implementation in linked to the Cartagena Convention in the section on Baseline projects for regional coordination efforts and support from financial institutions.
	7	Please develop an output to illustrate the impacts the project will have within the planned Small-scale domestic wastewater investments (component 3).	The approved PIF did not plan to allocate GEF resources in small-scale domestic wastewater investments, Component 3 Output 1 of the PIF states: While industrial sources of water pollution will be addressed in project component 1, this output will focus on domestic wastewater sources. Local authorities and residents will be sensitized in the need to reduce the amount of wastewater released directly into the river without treatment. An awareness raising program will be developed to inform the population of the meaning of the water quality data collected in Component 1 and how to proceed in case of pollution peaks, events associated to climate change and sea level rise, based on the State Programs of Action on Climate Change promoted by the Mexican Federal Government, which aims at improving the public perception on mitigating emissions of greenhouse gases as well as impacts, vulnerability and adaptation to climate change at the state and municipal level. Although this could have been contemplated in the early preparatory discussions for the PIF, small-scale domestic investments are not contemplated, per se, in the approved PIF

	8	Please include gender related activities and inclusion in all components, not only component 3.	Gender and CSO involvement are intrinsically interwoven into the FSP. The communities in which the SAP Implementation Project will deliver results will be confirmed in year 1 in particular by FAO during implementation of Component 2 (2.3 and 2.4 – Implementing existing fisheries management plans and, Implementation of VGSSF), as well as by Executing Agencies (UADY and INECOL under 3.1 and 3.2, Education programmes on domestic wastewater and, Mangrove restoration, respectively). The Project has also been designed to seek and support strong cross linkages, for example with Component 1, in particular Activity 1.4.2 the Environmental Monitoring System. It is expected for example that the Early Warning System will alert both women and men regarding the imminence of a health or environmental threat.
	9	UNIDO is clearly cutting edge as an implementing agency with regards to pollution control and is building on many successful interventions. Yet, we still lack an argument for the comparative advantage of UNIDO within the GEF family of agencies for working on fisheries and marine ecosystem protection/ conservation. Please provide assurance that by CEO endorsement there is a true partnership with another GEF agency in backstopping this project on the side of fisheries. It is not clear why the dialogue with FAO has not matured further.	FAO has been brought on board as provider of technical assistance (TA) and role was defined with the Agency and the countries during the extended stakeholder meetings organized during the PPG phase in Mexico City (April 2015) and in Miami (Aug 2015) and via teleconferences and personal meetings. An Interagency Agreement will be signed defining FAO responsibility for delivery of Outputs 2.3 and 2.4 - Technical support to implement already existing management plans; and, Implementation of FAO Voluntary Guidelines on Small Scale Fisheries – respectively (see Annex H)
	10	By CEO endorsement: The fishery project target will have to be defined. The component 2 proposal will have to be reformulated. The baseline will have to provide an overview of the situation, with a presentation of the legal frame, the fish stocks trends, the economic and social situation in related countries. The baseline will have to further develop the root causes of fish stocks depletion presented in the TDA. Finally, the baseline will highlight the major past and on-going related initiatives.	Component 2 has been reformulated in line with the decisions the partner countries took during the extended stakeholder workshop in Mexico City in April 2014. These decisions were communicated by Mr. Cesar Chavez, Mexican Focal Point on 3 June 2015 to GEF SEC. Target species has been defined, and the baseline now provides a detailed overview of the fisheries for these species. The project also reviews in detail the legal framework, fish stock trends and social situation in both countries. Please refer to the Component 2 of the FSP for additional information, as well as to additional supporting information that can also be accessed in the following PPG supporting reports (summarized in Annex F): • Report on TDA and fisheries related information (A. Hernandez – 2015) • Promoting sustainable fisheries in the

			GoM LME (A. Hernandez – 2015) • The legal framework of fisheries for Mexico and the US in the Gulf of Mexico LME • Report on previous efforts of U.S. and Mexico implement joint stock assessments for the project LME-GoM (A. Hernandez – 2015) • Report on the status of two Management Plans (preparation and implementation), whose implementation will be facilitated by the GoM SAP Implementation Project (A. Hernandez – 2015) • FAO voluntary guidelines for securing sustainable small-scale fisheries in the context of food security and poverty eradication (A. Hernandez – 2015) Root causes, as presented in the TDA have also been addressed, and major past and ongoing - as well as future initiatives - are also described in this SAP implementation project proposal.
	11	Please develop clear targets for all components, including Component 2.	Clear and measurable targets have been developed and integrated throughout. These were extensively negotiated during the PPG phase and agreed upon as realistic, implementable and measurable.
	12	The pressures on the GoM LME including fisheries seem to be multifaceted and to be including Climate Change, but other pressures also persists, such as overfishing, please elaborate on these pressures and their dynamic impact on each other.	Please refer to the section on Existing challenges, under the Baseline scenario chapter where these important points raised by the reviewers have been addressed in detail.
	13	The outputs will have to focus on addressing the major root causes and be well aligned with the TDA and the IW strategy. Clear definition of the expected project's results will be developed. The role of national executing partners will be specified.	Please see project document and Logframe. These concerns have been extensive and fully addressed throughout the document. Outputs are clearly in line with the TDA and the IW strategy. A clear definition of the expected project results has been included throughout the document and it is reflected in the logical framework. National Executing partners have been selected in line with their mandates and their comparative advantages. Their roles have been clarified and responsibilities and expected deliverables are clearly established and reflected. Each of the proposed national executing partners has been subject to a due diligence by UNIDO's procurement unit.

UNIDO Responses to STAP Comments			
	1	This project is based on the preparation of a TDA and further development of a SAP (to be signed by the two governments). The proposed project is about implementation of the SAP that identifies the following 6 key investment areas: 1) improve water quality; 2) avoid depletion and recover depleted living marine resources; 3) conserve coastal and marine ecosystems; 4) mitigate and adapt to climate change; 5) improve science education and outreach; and 6) cross cutting issues. The proposed project components focus on 1, 2 and 3 above. At the same time a key barrier as noted in the PIF is the political complexities and economic differences in the region and the need to overcome these. However, this issue is not targeted in the proposed components that are primarily of a technical character. The justification of the selection of components in the light of the larger set of issues referred to in the TDA and the SAP should be developed during the project preparation period and documented to ensure that limited GEF financial resources achieve the best possible impact and contribute to longer term sustainable development in this LME beyond the lifetime of the project.	The SAP Implementation Project is designed to support the achievement of the vision of a "decisive multinational effort to further enhance the sustainable use of resources as well as to ensure the provision of goods and services to the Gulf's bordering nations". As such this focuses on delivering results that directly contribute to the reduction of the negative effects of the root causes identified in the TDA and, actions outlined in the SAP. The basis for the application of the Ecosystem Based Management approach in the GoM-LME (EBM) and its resources was established during the Integrated Assessment and Management of the GoM SAP Development Project, and now requires practical application of interventions to address root causes and identified gaps, barriers, and constraints in order to promote reforms, investments and development of common mechanisms and tools. The proposed "decisive multinational effort to further enhance the sustainable use of resources as well as to ensure the provision of goods and services to the Gulf's bordering nations", offers that this new integrated vision must not only take into account biological and physical components alike but, be "spatial, multi-disciplinary, multi-criteria, multi-sectorial, and multi scale". All of these have been included in the current project. While the TDA and SAP reference a larger set of issues than those covered by the components for this project, it is important to note that they were selected by the partner countries, and are in line with their priorities to address the most pressing TDA and SAP related issues. In support of this, significant co-financing has been mobilized by the countries to address these priority issues through the consensually developed and agreed to set of interventions. These resources will support priority activities the countries have singled out to receive the GEF increment, which will effectively bridge the gaps identified in the baseline. As specified in Art 39 of the Mexican General Sustainable Fisheries and Aquaculture Law Fisheries Management Plans are much more than technical instruments, they contain management objectives, biological characteristics of the species, a description of the administration of the area and the mechanisms for participation of individuals and communities, status of exploitation,

			geographical locations subject to exploitation, socio-economic indicators of the people engaged in fishing, and fishing gear and methods authorized. Supporting bilateral cooperation for the implementation of the first transboundary stock assessment in the GoM LME and the development of management plans for this stock in Mexico/the amendment of management plans for this species (in the United States) in line with the results of the stock assessment, will significantly contribute to overcome the political complexities and economic differences in the region.
	2	Regarding the water quality component the approach is to primarily implement UNIDO's Transfer of Environmental Sound Technologies (TEST) approach to pollution control. This can be a relevant approach but the PIF does not explicitly refer to other government approaches to combat point source pollution	We note and appreciate the positive comment towards the relevance of the TEST approach and have addressed the concern about not referencing other government approaches to combat point source pollution. For example, the Project takes into consideration that the six-year Development plans of the States of Campeche, Tamaulipas, Tabasco, and Veracruz, all single out the importance of reducing pollution from industrial sources. In the case of Veracruz for example, the 2011-2016 Development Plan (Plan Veracruzano de Desarrollo 2011-2016) states that the 14 most important rivers in this state carry significant levels of pollution due to inadequately treated or untreated industrial wastewater discharges. The Project will address industrial water pollution in particular, contributing to the improvement in water quality, as well as reducing hypoxic zones. In support of this, Activities will also seek to support the environmental objectives and selection criteria of the Mexican Technical Standard NMX-AA-159-SCFI-2012, which establishes the procedure for environmental flow determination in hydrological basins, in particular ecological relevance and intensity of demand. The project will also support the determination of additional indicators which should be monitored in the country to provide a more complete assessment of water quality, in line with the revised version of the Official Mexican Standard for wastewater discharges (NOM-001) at regional level (including the priority hotspots). As presented in the report “Improve water

			quality (Y. Cachu, 2015 in Annex F) data from CONAGUA's National Water Information System (http://201.116.60.25/sina/) and the Mexican Water Atlas (2007-2013) show that the investment in municipal wastewater treatment has resulted in lower levels of BOD_5 from municipal discharges, but levels of BOD_5, related to untreated industrial discharges have continued to rise with 6.95 million ton BOD_5/year in 2007 compared to 9.95 million ton BOD_5/year in 2013.Provision of technical assistance to industries for the application of the UNIDO TEST methodology will contribute to reverse this trend. Strengthening the institutional capacities of the National Cleaner Production Center as well as strengthening the dialogue between industry and government will assure sustainability of this intervention. Furthermore under Component 1 water pollution indicators will be assessed and quality monitoring mechanisms will be reinforced (Output 1.1.) and an environmental monitoring program will be implemented (Output 1.4)
	3	The Coatzacoalcos river is named as a special hot spot to be addressed in this project, as it contains the second largest chlor-alkali plant in Latin America. More specifically, it is a plant that uses mercury in its production processes (as opposed to diaphragm or membrane processes); but this plant is one of two listed for Mexico under UNEP's Global Mercury Chlor-Alkali Partnership. Apart from the already recognized Industrias Quimicas del Itstmo chlor alkali plant, there are several additional mercury sources in the area. There are the Cangrejara and Morelos petrochemicals complexes, and several incinerators of regional hospitals and crematoria. There is an oil and gas refinery (General Lazaro Cardenas refinery) which operates at a capacity of 350,000 barrels/day. There are 23 incinerators in the Pajaritos petrochemical complex, one of which mainly burns wastes	We note also, and have taken serious consideration of the extensive comments regarding mercury contamination and the frequently exceeded exposure to levels, above recommended thresholds. This issue will be explored in depth in a complementary MSP currently being developed and the SAP Implementation Project has, throughout its narrative, opened links to complementing/benefitting from the results of this complementary project, for example through monitoring related activities

		from vinyl chloride production. Mercury can also come as a threat to human health from fish. Fish sampled in Coatzacoalas River (common and fat snook, gafftopsail catfish) had mercury levels above the US EPA mean Hg reference dose of 0.22ppm. This corresponds to a recommendation of not being eaten more than once a month. Some samples exceeded by about 1.8 fold the reference . Other studies have inferred air transport of Mercury from the aforementioned petrochemical chemical complexes, carried by prevailing wind currents in the region of Coatzacoalcos and going south and southeast to be deposited by rainfall.	
	4	Coordination of national governance would also benefit the project, though there does already seem to be consideration of several important national bodies, at various levels of government and/or private sector. Careful cobbling together and complementarity of roles of each in the project will be critical. This project's support to the broader water resources management programs implemented by CONAGUA should be referred. Ideally these activities fit strategically into CONAGUA's IWRM frameworks.	The STAPs comments on coordination of national governance have also been addressed. Under output 3.3 (Improved coordination and bilateral cooperation through strengthening of networks) the SAP Implementation Project will support SEMARNAT and SEMAR, which is the lead for the Inter-Ministerial Committee for the Integrated Management of Oceans and Coasts (Comisión Intersecretarial para el Manejo Sustentable de Mares y Costas - CIMARES). It is expected that governance capabilities of CIMARES will be enhanced. Coordination of national governance will also be enhanced as regards CONAGUAs activities. However this is also considered a priority for all components, which under the broader heading of capacity building, will actively pursue the empowerment of stakeholders. This is sought in order to provide them with the abilities and skills to plan, initiate, manage, evaluate (and learn) and complete activities. In addition, special consideration will be given to fragile stakeholder groups (women, children, marginalized communities, etc.) as well as to institutions that can play a key catalytic role in the implementation and successful results of the SAP Implementation Project (NGOs, CSOs, small businesses, etc.).

	5	Regarding the coastal components there is no mention of the role of reefs or estuaries in this PIF, though attention is paid to rehabilitation of fisheries. Reefs play important breeding and source areas for larger species such a grouper. UNIDO might commiserate with past/ongoing GEF projects such as the Ridges to Reefs programme (GEF ID 5404) or the "Reducing Pesticide Run-Off to the Caribbean Sea" (GEF ID 1248) project (though STAP is sure there can be other examples found across the GEF portfolio) to serve as additional sources of info and lessons learned. The issue of ecosystem management seems to have been skipped in favour of concentration on fisheries, which are likely impacted by degraded habitat as much as overfishing. Cleaning up the water and better management of fishing practices alone will not necessarily translate to rehabilitated fisheries.	The issue of estuaries and improving ecosystem health is addressed by output 3.2 (Community based wetland restoration) under which the results achieved by the SAP Development Project in mangrove restoration will be replicated and up-scaled. In conjunction with the activities supported under Output 2.4 (Implementation of the Voluntary Guidelines for Sustainable Small Scale Fisheries), which are geared to reducing IUU, eco-labeling (fisheries) and alternative livelihood options will contribute to reduce pressure on fragile coastal ecosystems and reverse the trend of habitat degradation.
	6	Finally there is no planning in place for resilience to climate. How is planning for climate change adaptation accommodating, or are rehabilitation targets being baselined on a past status quo? How will the fisheries industry be adapting	Climate change is addressed on one hand by activities and projects detailed in the baseline section, such as SEMARNAT´s conservation of coastal watersheds in the context of climate change; the World Bank project on adaptation of the Gulf of Mexico´s coastal mangroves to the impacts of climate change; the IADB project on adaptation, land use, and integrated management planning for the Grijalva and Usumacinta watersheds and the National Strategy on Climate Change and the Climate Change Special Program. On the other hand climate change adaptation will be mainstreamed into the fishery management plan to be developed under output 2.2. The Transboundary Stock assessment to be supported under output 2.1 will provide the baseline.

Annex C: Status of implementation of project preparation activities and the use of funds[56]

A. Provide detailed funding amount of the PPG activities financing status in the table below:

PPG Grant Approved at PIF: **300,000**			
Project Preparation Activities Implemented	***GEF/LDCF/SCCF Amount ($)***		
	Budgeted Amount	***Amount Spent Todate***	***Amount Committed***
Staff & Intern Consultants	115,613	101,310	
Local travel	65,182	46,501	12,000
Nat.Consult./Staff	43,873	43,873	
Train/Fellowship/Study	4,219	4,219	
Contractual Services	70,242	70,242	
Other Direct Costs	871	221	
Total	300,000	266,366	12,000

US$101,310 was spent on international consultants to review and refine the inputs provided by national consultants and for the consultative process to develop the CEO endorsement document and to coordinate this consultative process with Mexican and United States stakeholders.

US$46,501 was spent on local travel to facilitate the participation of Mexican stakeholders in consultative meetings that were organized in Mexico and the United States and to facilitate the local travel of national consultants during their assignments.

US$4,219 was spent on trainings of national experts

US$70,242 was spent to facilitate the provision of fishery related inputs into the project document by FAO by means of an interagency agreement[57].

US$221 was spent on other direct cost related to the development of the CEO endorsement document.

[56] If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue to undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities. Agencies should also report closing of PPG to Trustee in its Quarterly Report.

[57] See Annex G