

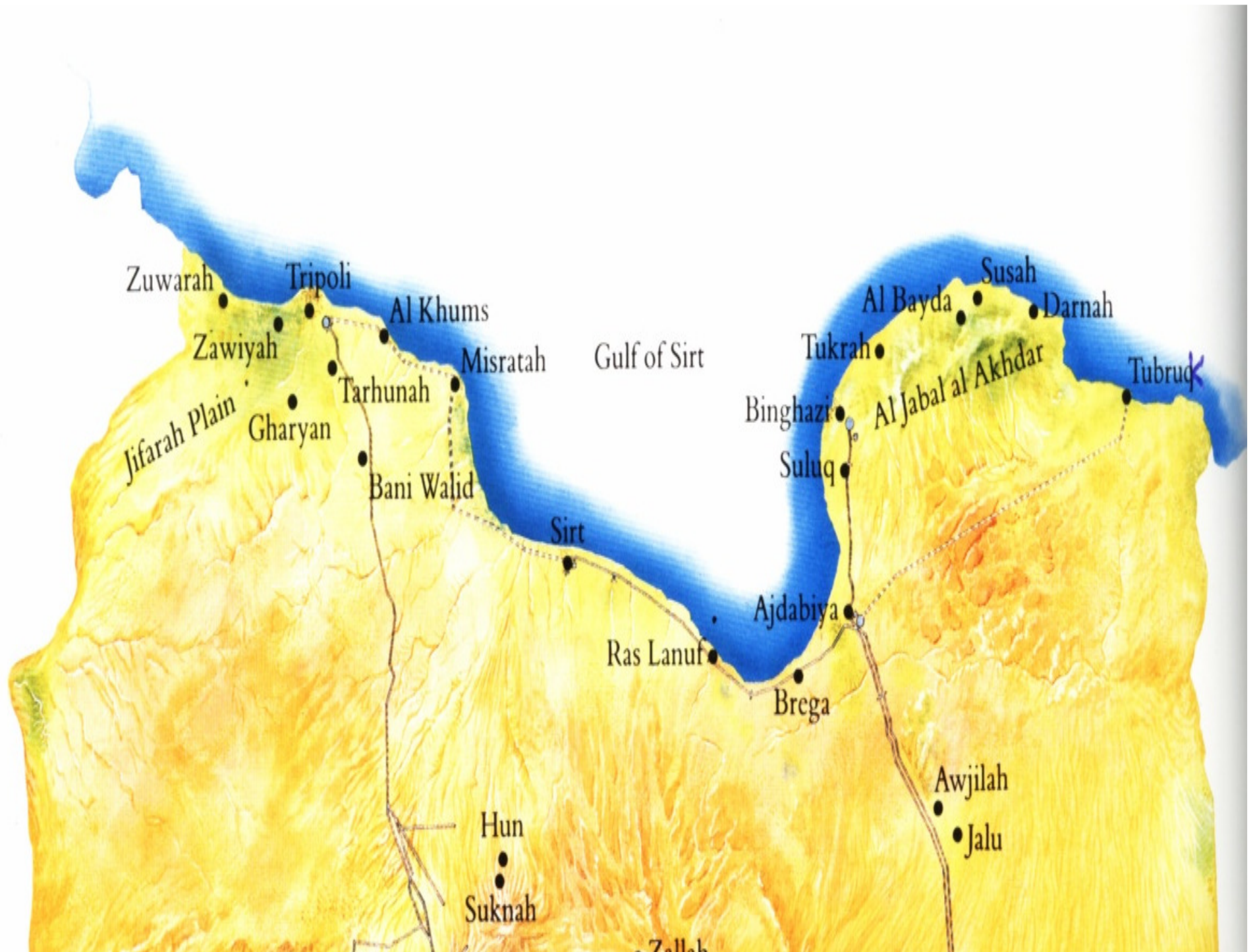
Presentation on the Proposed
Monitoring Programs of Libyans
Marine Environment

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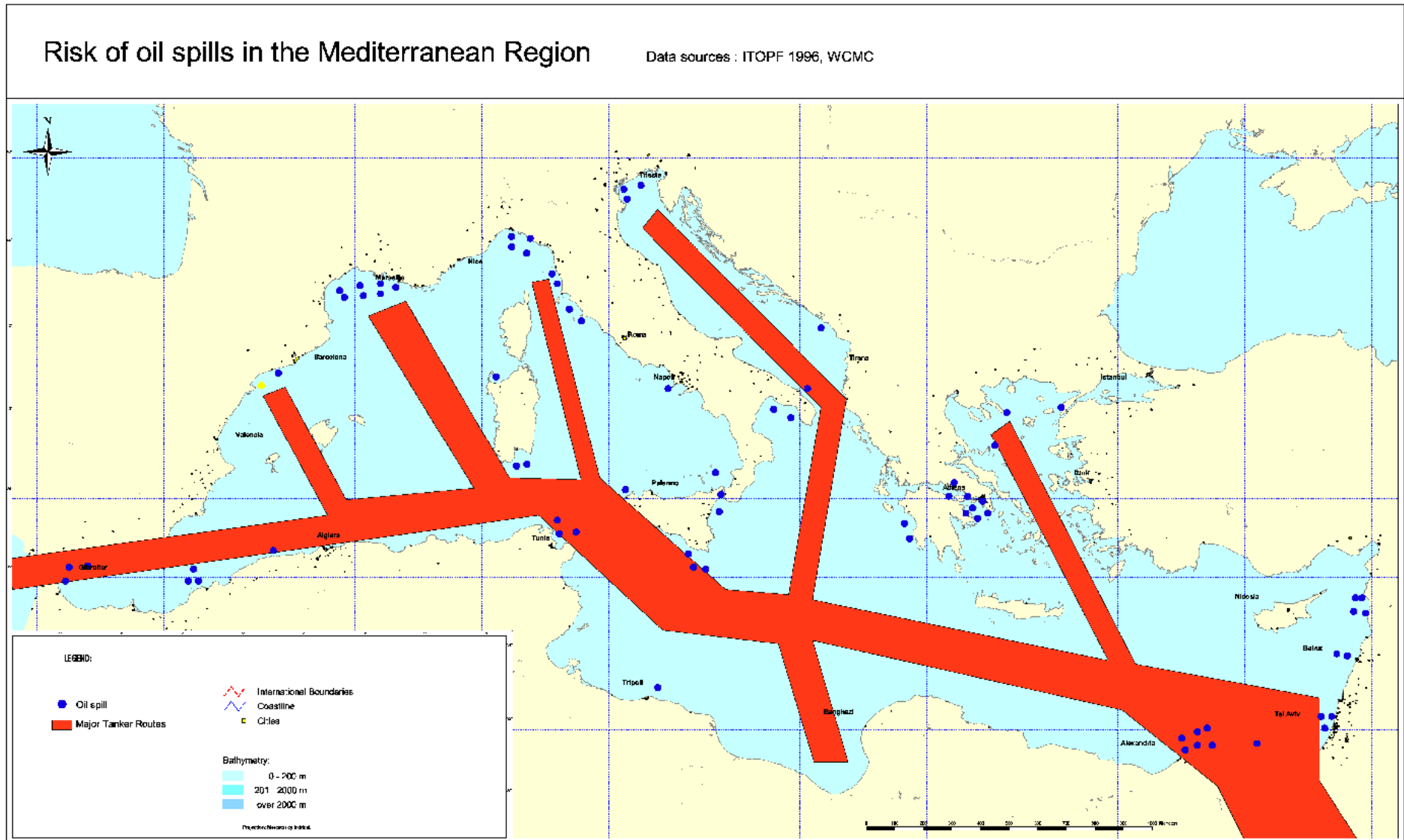
Alexandria , Egypt, 11-12 Spetmber 2018

Presentation Outline

- Introduction the main principle
- Legal Frame work & Competent Authorities
- Current Status
- National Work Plan For Marine (SEIS Project as an opportunity)
- Challenges



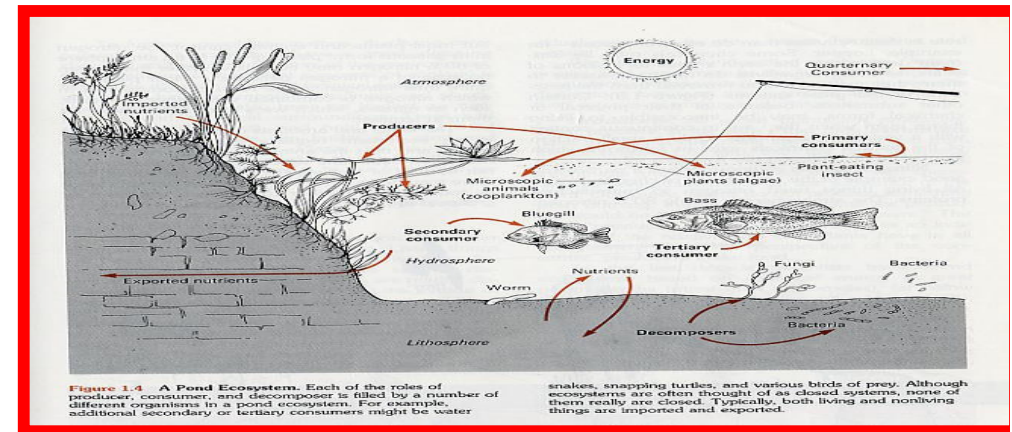
Libya has a long and active coastline about 6 % of the total Med. Cost



Environmental Monitoring

- **Monitoring** : is the process of gaining information about the status of the ecosystem by cheap and scientifically sound means.
- **Marine Ecosystem.** the aquatic or the marine Ecosystem consists of tree main component that are :-

- Water Column
- Living Organisms
- Bottom Sediment



in the context of Ecosystem Approach and IMAP implementation **Integrated Monitoring** means getting information from more than one component

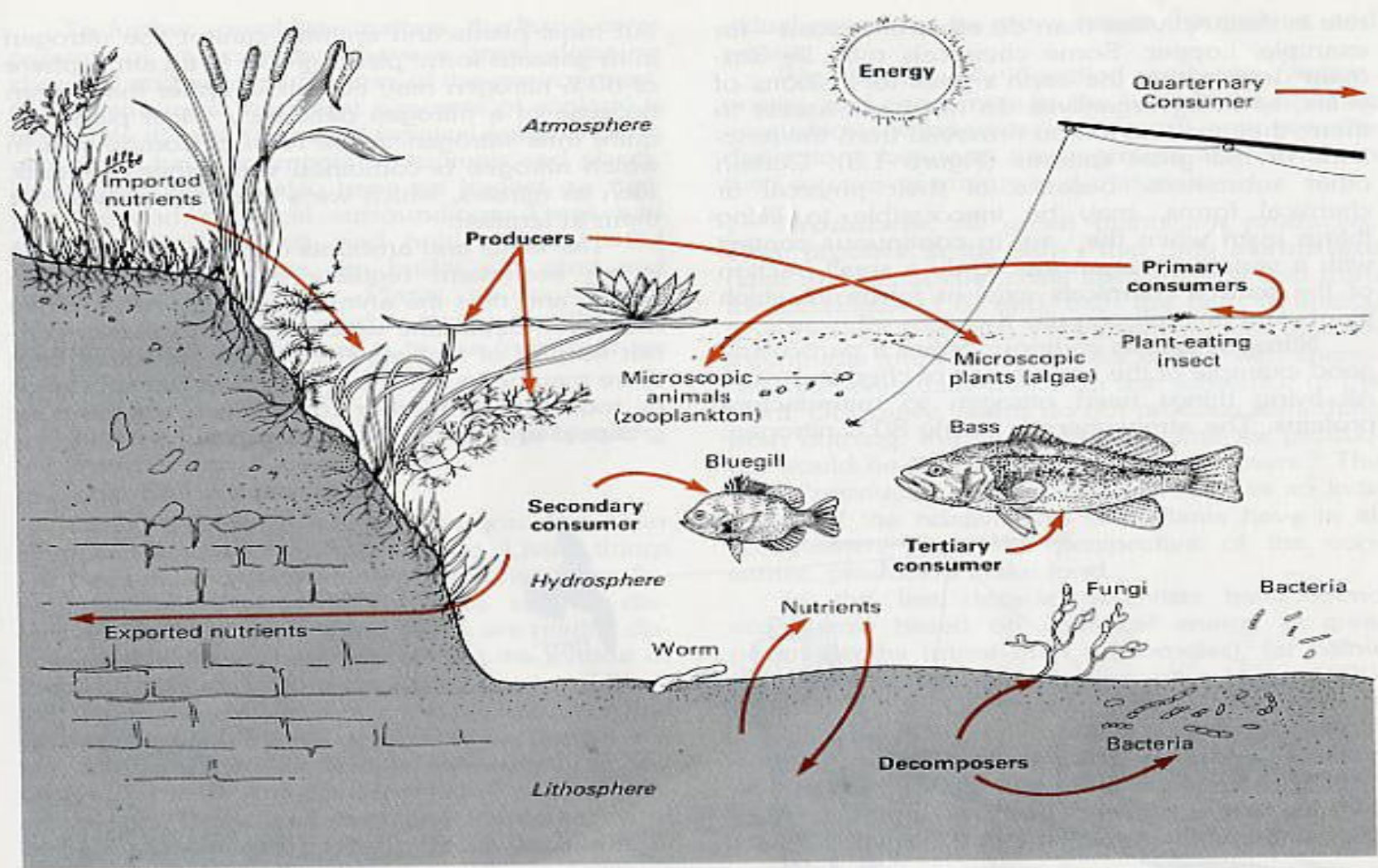
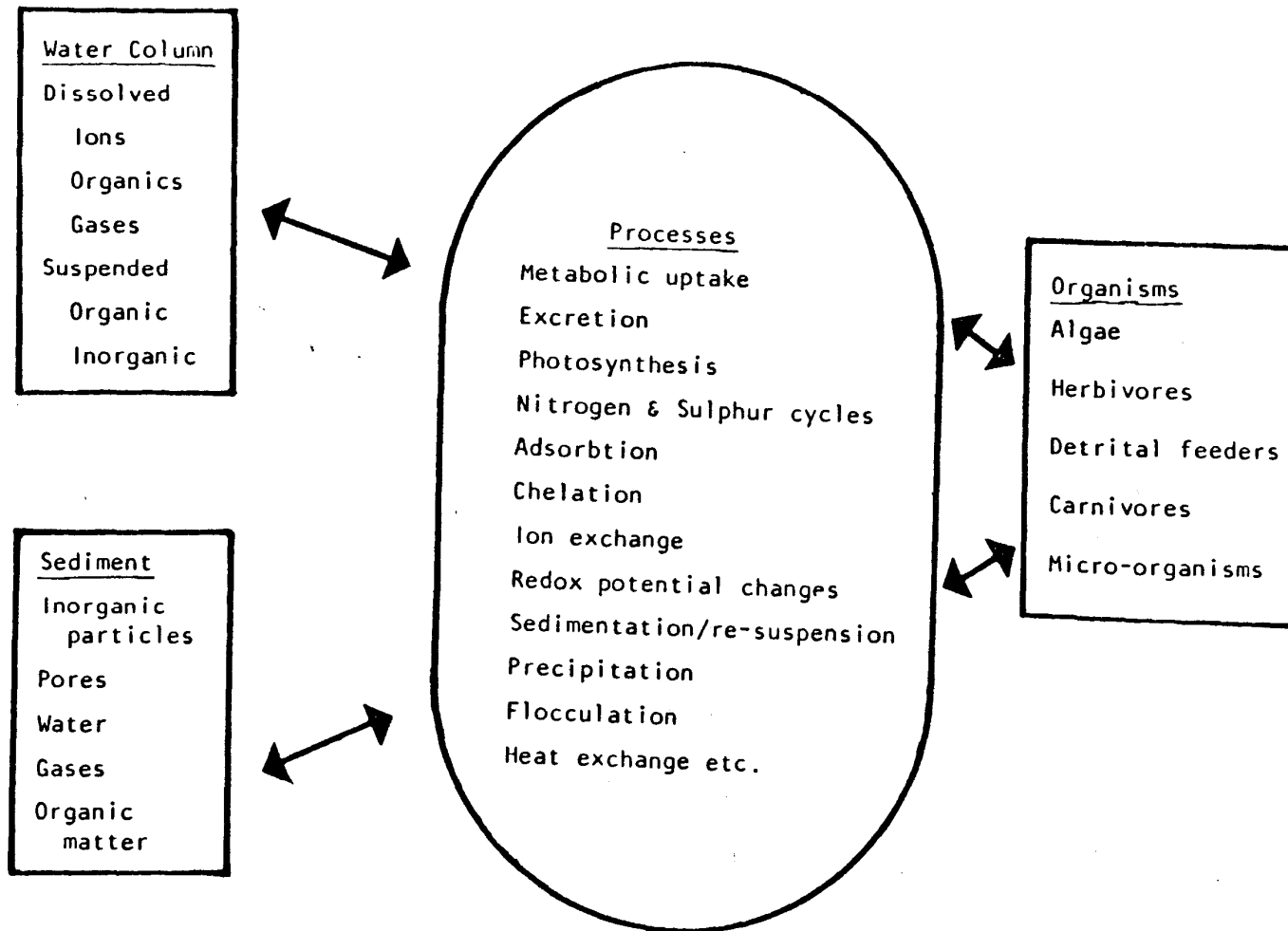


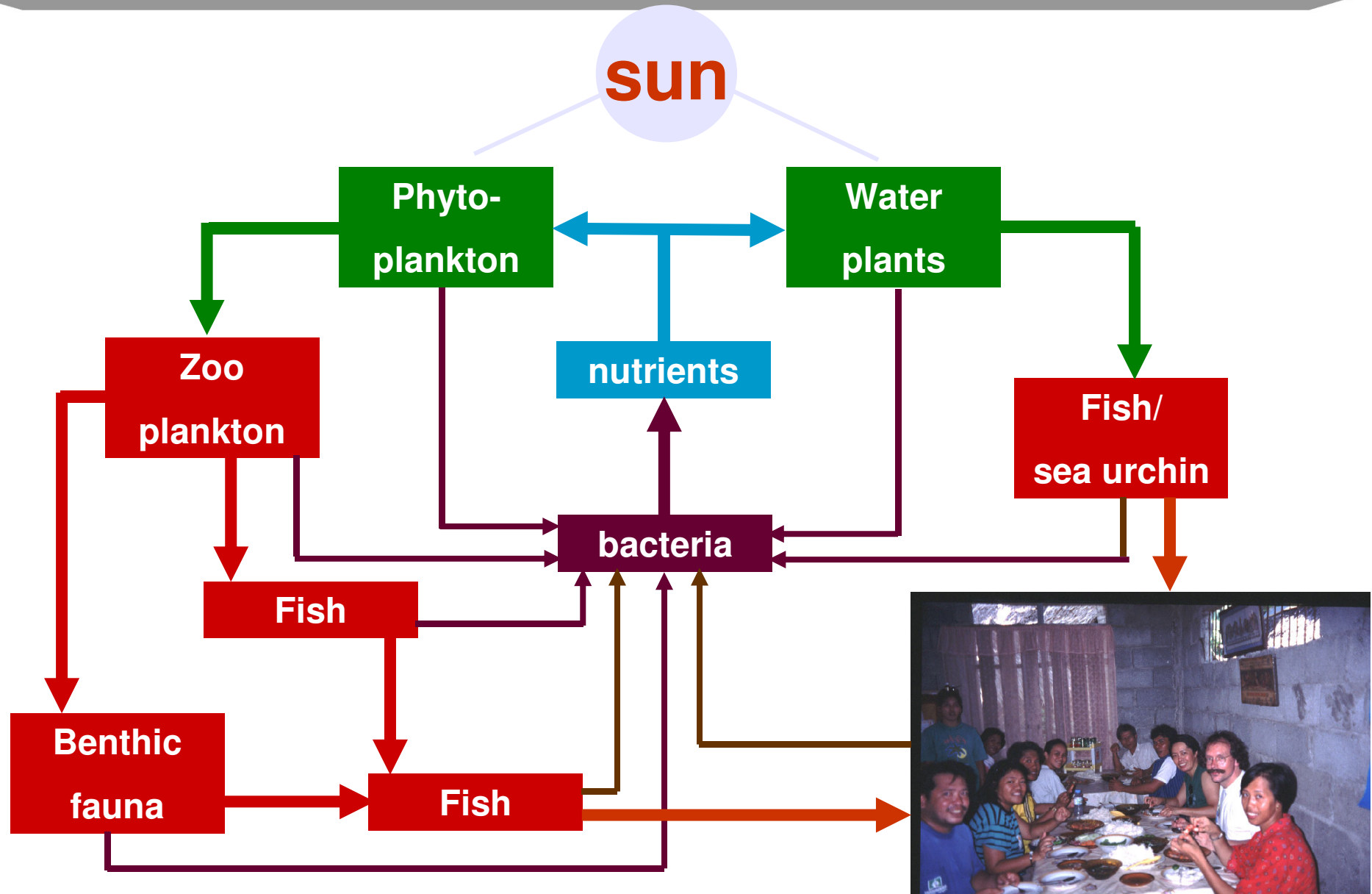
Figure 1.4 A Pond Ecosystem. Each of the roles of producer, consumer, and decomposer is filled by a number of different organisms in a pond ecosystem. For example, additional secondary or tertiary consumers might be water

snakes, snapping turtles, and various birds of prey. Although ecosystems are often thought of as closed systems, none of them really are closed. Typically, both living and nonliving things are imported and exported.

Fig 1 : A concept of functional compartments in an estuary linked by processes



Understanding environmental impacts: aquatic food web



Environment General Authority

Marine Biology Research Centre

Bureau of Statistics

In addition other important stakeholders include the Ministry of Local Government, Ports and Maritime Transport Authority, General Authority for Marine Wealth, General Authority for scientific research centers, the National Oil Corporation (NOC), and other research centers such as the Libyan Petroleum Institute (LPI), and academia, the Libyan Center for Remote Sensing and Space Science (LCRSSS) and a number of Non-government Organization that are focusing on the protect the marine environment .







Table (7) Shows the Total Nitrogen (TN mg/l), Standard deviation (SD) and the Confidence interval (CI) for all Zones.

CI	SD	Mean (mg/l)	Replicates	Location
8.18-5.22	4.009	6.36	6	A
3.60-1.70	1.025	2.25	6	B
5.11-3.82	2.453	4.86	6	C
3.14-1,19	1.704	2.93	6	D

Table (11) Shows the concentration of Total phosphorus (TP mg/l), the Standard deviation (SD) and the Confidence interval (CI) for all Zones.

CI	SD	Mean (mg/l)	Replicates	Location
1.49-2.43	0.45	1.95	6	A
0.51-1.39	0.17	0.95	6	B
1.67-1.67	0.04	2.22	6	C
2.33-2.33	0.15	1.28	6	D

Table (12) Shows the Flow, the concentrations (mg/l) and Load of BOD, COD Total suspended Solid (TSS), Total Nitrogen (TN) , Total phosphorus (TP) of the wastewater that enters the Lake.

Yearly Load ton	Daily Load ton	Concentration (g/m³)	Mean Flow m³ /day	Parameters
2971.47	8.141	195	41765	BOD
5456..75	14.95	358	41765	COD
1752	4.80	115	41765	TSS
65.7	0.18	4.40	41765	TN
25.55	0.07	1.73	41765	TP

Although Eutrophication is not a common phenomenon along the Libyan coastal water, continuation of sewage discharge with excessive input of phosphorus and nitrogen, would contribute largely to the acceleration of the occurrence of this phenomenon particularly around the major cities. Nutrient over-enrichment has a range of effects on coastal systems, but in general, it brings an ecological changes that decrease the biological diversity, (the variety of living organisms) in the ecosystem.

It is well known also that, when additional nutrients or organic matter enters to the coastal area or confined sea, or coastal lake will disrupted the overall equilibrium and upset the system leading to initiation of the Eutrophication process

Discharges of high-BOD/COD waters to the coastal environment should therefore be restricted unless a sufficiently high degree of dispersion is guaranteed by the outfall to avoid accumulation of particulate matters and the depletion of oxygen.

Marine plastic litter is a form of pollution and is an example of a market failure.

- **Currently no data available on marine littering**
- **In General A large percentage of marine litter is estimated to be of riverine origin (80 % ?) but we wanted to know the extent of the problem in Libya and its contribution since no river system exist**
- **Seasonal estuaries and point source input could be the major entry points of litter to the marine environment (it has to be measured)**

As our society has developed plastic, first developed in Libya the 1980's, it has become indispensable in our economic and social development, and has offered a great many benefits to the society covering every sector from health and food preservation. Today, we are inundated by a result of our careless approach to the use and more so the lack of planning for the post-use life of this durable material which has been accompanied by a significant social, economic and ecological cost

النسبة المئوية من الوزن	المكون
54.1	موا عضوية
12.1	ورق وكرتون
1.6	أخشاب
3.5	أنسجة مختلفة
7.8	بلاستيك
3.90	زجاج
6.9	معادن
10.10	أترية

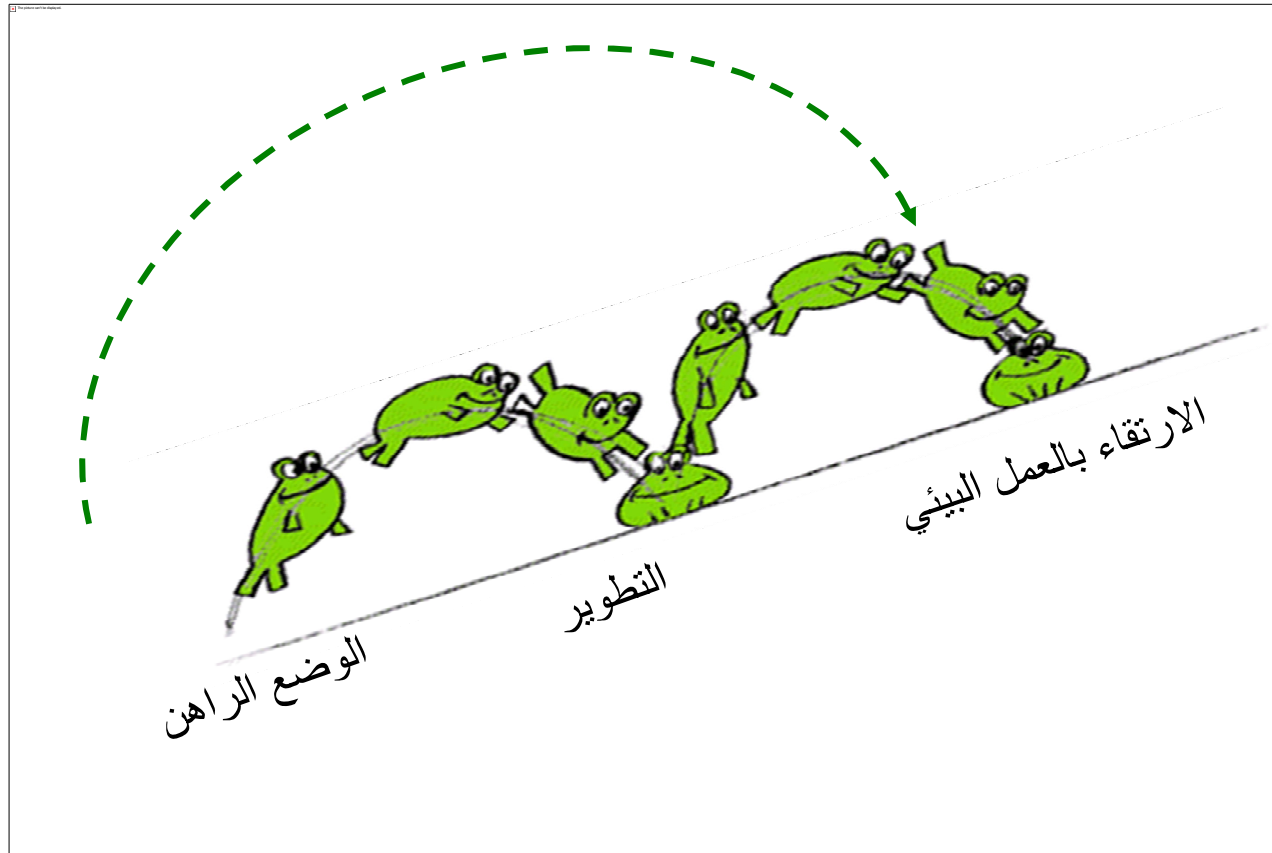
Waste Constituents In general

- **Organic** **55-70 %**
- **Plastic** **5-17 %**
- **Paper & cardboard** **11-17 %**
- **Glass** **2-2.5 %**
- **Metal** **2-2.5 %**
- **Other** **4-7 %**

The negative impacts of marine plastic litter and microplastics currently are widely recognized in Libya, in fact it had reached a level that can be considered **as beyond acceptable** at both **the ecological** and the **socio-economic** levels.

Future Plan

The SEIS project set the milestone that will leap frog the Marine Environment Monitoring programme as it take in board all the relevant stakeholder



In conclusion the country is working hard in developing more sustainable Environmental Information and Management System that should provide decision-makers and managers with the environmental information needed to take decisions concerning the marine environment.

It will also help formulating the proper strategy for increasing research and development of new technologies to combat marine pollution and environmental problems and to fulfill our obligation toward the BC.

وصف لحال الوضع الرهن بخصوص منظومة المعلومات البيئية

التحديات

النقص الحاد في وجود بيانات بيئية موثوقة	نقص أو ضعف الاطار التشريعي خاصة في مجال مشاركة وتنسيق البيانات بين اصحاب المصلحة	غياب التوافق بين اصحاب المصلحة والحاجة إلى المشاركة والتنسيق الجهود على المستوى الوطني	عدم وجود منظومة لتدفق البيانات وإدارتها
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انشطة مسحية تتطلب دعم

ضمان التعاون بين كل الجهات ذات العلاقة والحاجة إلى مشاركة البيانات والمعلومات البيئية	القيام بوضع خريطة مفصلة للجهات ذات العلاقة والبيانات المتوفرة وزمن توفرها	تصميم البيانات و آلية مشاركة المعلومات البيئية
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متطلبات المرحلة الأولى لبرنامج المراقبة للبيئة البحرية

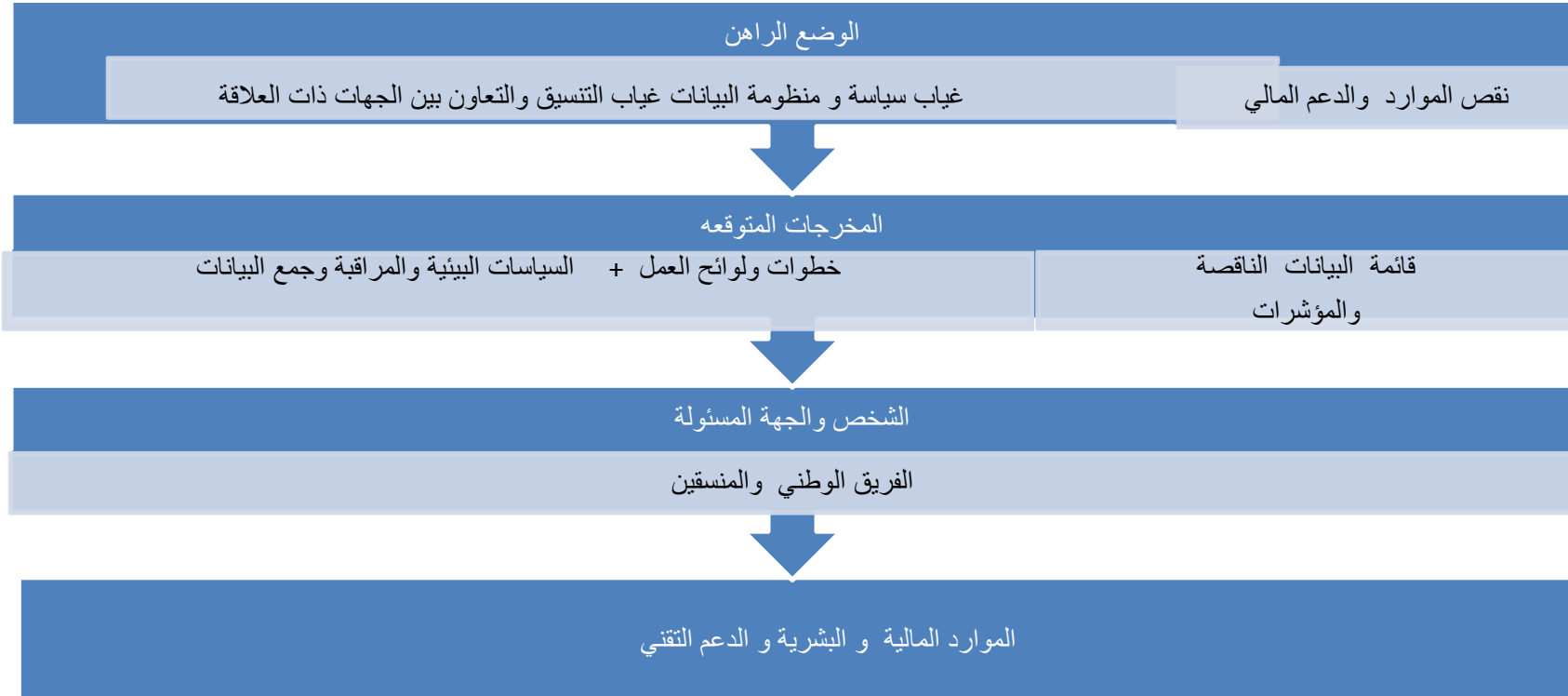
الاولويات

تطوير نظام مشاركة
معلومات وتقييم
البيانات وحساب
المؤشرات

تقوية تقرير حالة البيئة
Strengthening

تقوية التعاون بين
الادارات بالمؤسسات

Development of Shared System, Assessment of Data/Indicators



Infrastructure for the monitoring programme

Laboratories and equipment availability:

The Libyan Government has investment largely between 2005-2010 on setting up the infrastructure for many Ministries of which the laboratories equipment was one of the main area targeted for the investment and a number of new laboratories were established. In fact over the past years, various institutions have built their capacity to operate the laboratories equipment. Technical staffs are available but need to build their capacity in an effective way so that they can be successfully utilized in a program designed to monitor the marine environment. There are several laboratories that were capable in carrying out the monitoring programme of the marine environment as these are mostly equipped with the best equipment in the field of analysis. These laboratories are as follow:

Laboratory of Environment General Authority (EGA):

Within the project of equipping the laboratories of EGA, the Laboratory has reached the level where it can carry out the monitoring tasks with confidence. The laboratory was equipped with several instruments that covers most of the water analysis generally needed, such as Gas and Liquid Chromatography (GLC) with various detectors, Atomic Absorption Spectrometers (AAS) and Atomic Emission Spectroscopy (AES) devices. The lab has not been operated, it needs chemicals and reagents. The technical staffs also needs to build up their capacity in a more effective way so that they can be successfully be utilized in a program designed to monitor the marine environment.

Laboratory of Marine Biology Research Centre (MBRC):

Three laboratories were specifically working to measure pollution on the marine environment such as heavy metals in marine organisms waters and sediments. The laboratories is equipped with several instruments that is needed for the routine monitoring work particularly nutrients, Chlorophyll a and heavy metals .

Laboratory Libyan Petroleum Institute (LPI):

This lab provide analytical support and advice to NOC petroleum companies and to many private and government agencies, Moreover, a mobile laboratory introduced as a part of the continuous development to provide most of the necessary analysis through field visits,

Existing Monitoring Effort, Programmers, Networks or Initiatives of Relevance for Environmental Monitoring

Environmental monitoring of the marine environment can be defined as the systematic sampling of the main compartments of the marine environment that's water, biota and sediments in order to observe and gain information, as well as to derive knowledge from this process (Artiola *et al.*, 2004). Monitoring can be conducted for a number of purposes, including assessing the effects of anthropogenic influences, to establish environmental baselines, trends, and effects, to educate the public about environmental conditions, to inform policy design and decision-making and to ensure compliance with environmental regulations and conventions. There are different pathways towards ecosystem monitoring, depending on reporting requirements and budgets.

The Environment General Authority (EGA), is the responsible body for environmental monitoring in general and monitoring the marine environment in particular at the national level, in co-ordinations with all the relevant institutions such as the Marine Biology Research Center (MBRC), Water General Authority, Water and waste water General company and all other stakeholder.

The Environment General Authority is currently working to improve their environmental management by first improving institutional capacity and reforming environmental policy in the country. In 2005 EGA prepared a National Programme for Environmental Sanitation prioritized of projects for transformation plan for the years 2006-2011.

Controlling and monitoring of environmental pollution was one of the top priority issues addressed. The objective of the Programme was to strengthen national capacity in the field of monitoring. The main themes for improving the marine environment were:-

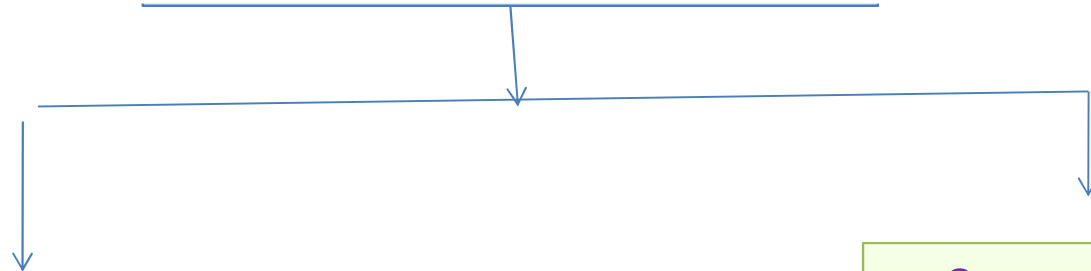
- Protection of coastal areas from degradation and pollution.
- Monitoring of the various environmental ecosystems.
- Protect the marine environment and reduce the causes (sources) of pollution to which it is exposed.

The main programme of the marine environment was to design a program for monitoring and measuring marine pollution on which an environmental database and information has to be built. It is believed that in order to create a data based, several monitoring and measurement stations has to be established and distributed throughout Libyan coast where its needed. This step has to be implemented and the financial resources for it has to be find and allocated.

In this proposed monitoring programme, the Ecological Objective EO5, EO9 and EO10 will be covered. The Ecological Objective EO5 for Eutrophication that covers the common indicators 13 for key nutrients in water column, and common indicator 14 for Chlorophyll –a in water column will be carried out by MRC and EGA .

The Ecological Objective EO9 for pollution and its common Indicator 17, 18 and 19 that deals with the concentration of key harmful contaminants will be determined and measured in biota (organisms have to be identified by MRC), sediment and seawater. There is a possibility with the coordination with LPI to include organics and metals and their load to the marine environment will be calculated. Libya has gained valuable experience in the Ecological Objective EO10 for Marine Litter (ML) through the Pilot project started last year where several surveys have been undertaken along the different beaches. The second phase will focus on the monitoring of the main three compartments of the marine environment that's water, biota and sediments, in order to get a clear picture on the status of the marine environment and determine its health to sustain biodiversity and their potential to provide and support essential ecosystem processes and services. Also to monitor in a scientifically sound means all the targeted Ecological Objectives and to achieve a full implementation of the IMAP .

**Environmental General
Authority (EGA)**



**Governmental Laboratories
Involved**

EGA

Marine Biology Research Lab-

Libyan Petroleum Institute Lab-

BoS for Indicators -

**Supporting
INSTITUTIONS**

Universities

**The Libyan
Academy**

**The Authorities of
scientific research**

The relevant

Research Centers

NGO

The Preliminary Proposed Stations for Marine Environment Monitoring

Site No	Considerat	Depth* (meter)	Distance from the beach (km)	Latitude N	Longitude E
Site 1 Ziwara	In the vicinity of Ziwara port & coastal urban area	<50	4	32°58'29.98"	12°4'46.83"
		50 - 100	15	33°4'58.56"	12°4'24.60"
		100 - 200	38	33°17'27.76"	12°3'43.65"
Site 2 Tripoli	In the vicinity of Miatiga Air port & coastal urban area	<50	3	32°55'24.18"	13°20'4.89"
		50 - 100	11	32°59'22.01"	13°19'57.46"
		100 - 200	14	33°1'38.71"	13°20'2.20"
Site 3 Ganima	remote area	<50	0.5	32°43'23.47"	14°4'50.83"
		50 - 100	1.5	32°43'57.37"	14°4'51.67"
		100 - 200	3	32°44'42.49"	14°4'49.45"
Site 4 Kaam	In the vicinity of Kaam river mouth	<50	4	32°32'36.34"	14°29'22.58"
		50 - 100	8	32°33'58.62"	14°31'45.78"
		100 - 200	14	32°35'35.60"	14°34'43.84"
Site 5 Buirat Alhason	remote area	<50	1.5	31°24'47.46"	15°44'35.98"
		50 - 100	3	31°25'12.21"	15°45'10.20"
		100 - 200	5.5	31°26'18.57"	15°46'6.77"
Site 6 Bin jawwad	remote area	<50	1.5	30°49'4.34"	18°5'32.34"
		50 - 100	2	30°49'18.05"	18°5'19.80"
		100 - 200	4	30°50'22.26"	18°5'50.27"
Site 7 Brega	In the vicinity of Brega oil port	20-50	1	30°25'32.29"	19°36'56.77"
		50 - 100	4	30°26'49.74"	19°35'24.19"
		100 - 200	7	30°27'41.08"	19°34'16.31"
Site 8 Benghazi	In the vicinity of Benghazi port & coastal urban area	<50	1.5	32°9'0.39"	20°4'0.20"
		50 - 100	3.5	32°9'52.85"	20°2'52.56"
		100 - 200	6.5	32°10'52.53"	20°1'22.18"
Site 9 Sosa	remote area	<50	1	32°54'32.28"	21°57'38.32"
		50 - 100	2.5	32°55'25.80"	21°57'37.47"
		100 - 200	5	32°56'35.26"	21°57'31.53"
Site 10 Tubroq	In the vicinity of Alhriga oil port	<50	1	32°3'17.16"	24°1'35.04"
		50 - 100	3	32°3'58.38"	24°2'16.01"
		100 - 200	4.5	32°4'45.42"	24°3'4.66"

Site (1), Ka'am beach



Sites



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