AGRICULTURAL UNIVERSITY OF TIRANA
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ENVIRONMENTAL RISK MANAGEMENT PLAN

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ABBREVIATIONS AND ACRONYMS

ERMP	ENVIRONMENTAL RISK MANAGEMENT PLAN
GFCM	General Fisheries Commission for the Mediterranean
ICES	International Council for the Exploration of the Sea
MPA	Monitoring Protected Area
MARDWA	Agriculture, Rural Development & Water Administration
ME	Ministry of Environment
PESBLD	Pan- European Strategy on Biological and Landscape Diversity
ALDFG	Abandoned, Lost Discarded Fishing Gear
MSSD	Mediterranean Strategy for Sustainable Development

INTRODUCTION

ENVIRONMENTAL RISK MANAGEMENT PLAN for Vlora Bay has been developed within the framework of the Interreg IPA CBC Programme "Italy-Albania-Montenegro 2014-2020., "ADRINET" Adriatic Network for Marine Ecosystem"/ Code. 244

Development of the ERMP is only one of the activities of the ADRINET Project. The ERMP has been developed through participatory approach, including, meetings, questionnaires, etc. This is the first time that the ERMP has been prepared in a way that stakeholders were consulted during the process of Management Plan development and not at the end of the process. The approach raised interest among stakeholders who actively participated and contributed to the process.

1. Description of the vlora gulf area

The Vlora represents one of the most attractive coastal areas of Albania and is considered as a very important tourist area. From the strategic point of view, Vlora Gulf represents one of the most important natural, tourist and industrial areas. Vlora Gulf is located on the border between the Adriatic and Ionian Sea. Location is shown in Figure 1. It is a semi-enclosed bay with limited water exchange with the Adriatic Sea via the inlet channel (Rivaro.et al., 2011).

Figure 1 Map of Vlora Bay

After the Gulf of Durres, it is the largest and most important geographically and industrially. The Gulf of Vlora has an area of 305 km², length of 36 km and width of 10 km. It starts north with the Cape of Triports and ends west with the Cape of Gjuhezes. The Vlora Gulf waterfront is divided into two distinct parts:

- The southern part that begins south of the Uji i Ftohte and is called the Ducati Bay, which is narrower and deeper.
- The northern part called Vlora Gulf, which is wider and shallower.

The maximum depth of Vlora Bay is 57 m and is located in its southern part. The Vjosa river delta and the Narta lagoon form the northern boundary of the Vlora Bay. The island of Sazan

with its rocky shores makes this area one of the safest natural areas of the Adriatic Sea (Corsi I. et al., 2011).

Port of Vlora Amongst four fishing ports in Albanian Coast, Vlora (90,000 population) has a large dedicated fishing port. This port is located several miles from the main town. Has two total freight quays at 8 meters deep and is the ferry terminal closest to Italy (Brindisi 70 km). There is also a separate fishing port (in Triport), to the north, where 30-40 commercial fishing boats anchor.

Table 1. The more important fish species in the Vlora Gulf

No.	scientific name of the species
1.	Merluccius merluccius
2.	Mullus barbatus
3.	Mullus surmulletus
4.	Sparus auratus
5.	Dicentrarchus labrax
6.	Sardina pilchardus
7.	Boops boops
8.	Parapenaeus longirostris
9.	Exocoetus volitans
10.	Trachurus trachurus
11.	Mugil cephalus
12.	Apogon imberbis
13.	Arnoglossus thori
14.	Octopus.spp
15.	Sepia spp
16.	Loligo spp
17.	Pagellus Erythrinus

The information is mainly used by the NATIONAL PARK OF NATURAL MARINE MANAGEMENT ECOSYSTEM OF THE PENINSULA KARABURUNI AND SAZAN ISLAND (Vlora Region)

2. Environmental and ecosystems in Vlora Gulf

Vlora Gulf, is represented southeastern edge of Otranto Strait. The coastline of Vlora Gulf -Vjosa River Mouth area has continuously modified its configuration by sedimentation of alluvium transported by Vjosa River water and the swell of the Adriatic Sea.

Considering Vlora Bay a specific fishing area, a coastal zone, mostly coastal fisheries are on the basis of the economical and social activities in the area.

In Vlora area, like in all over coasts of Albania during last 30 years of transition occurred a massive demographic movement, chaotic urbanization of the Albanian coast, moving from highest to lowest areas, like marine coastal. This phenomenon brought increased settlement in the coast, biggest pollution; increasing the pressure over the fish resources, illegal mainly. The marine environment along the Adriatic Coast is affected by the considerable pollution of the last 30 years, both by discharge into the sea of polluted river water and by direct discharge of untreated urban and industrial wastewater.

2.1 Potential sources of pollution of the Vlora Gulf

Coastal areas today have become industrial and urban discharge collectors, including the Vlora coast. The marine and coastal environment of Vlora constitutes resources of high economic and ecological value for the country. As a result of the mismanagement of these resources, in recent years significant amounts of waste have been discharged directly into the sea or through rivers and atmospheric depositions (Corsi I. et al, 2011).

Figure 2 Direct discharges of waste from the Soda-PVC plant near the Gulf of Vlora.

In 1992 production of the Soda-PVC Plant was stopped (which produced polyvinyl soda and chloride using an outdated technology). This plant lay 4 km north of the city of Vlora, discharging significant amounts of liquid waste directly into the sea with a high content of mercury and other pollutants (Rivaro.et al., 2011). In addition, polluted sludge with a high mercury content was deposited in a damp (about 25 ha) (CISM, 2008).

Another source of pollution is the Vjosa River, which emanates from Greece and flows throughout the southern part of Albania and flows into the northern part of the Vlora Bay, bringing with it relatively high erosion materials of relatively high Ni, Cr content. and numerous urban and terrestrial pollutants (Rivaro.et al., 2011). As a result of the low rate of water circulation in the bays, the source of pollution are also the shipping activities, which discharge various pollutants such as fuel, trace metals, nutrients, and organometallic compounds (UNEP,

1990). Finally, the natural composition of the waters is affected by anthropogenic pollution as a result of urban discharges from surrounding areas (Tursi et al., 2011).

Monitoring the impact of urban discharges on coastal water quality is carried out in the city of Vlora. Under the scheme, the quality of discharge waters at the discharge point (collectors or pumping stations) and their impact on coastal water quality is assessed. In the city of Vlora, urban water is discharged through pumping stations and discharged into the sea in the Soda Forest area (ENVIRONMENTAL REPORT 2017-National Environment Agency)

3. Marine fisheries

3.1 The status of the fish stocks

Albania joins stock valuation only in campaigns organized by the AdriaMED Program which supports Adriatic countries in valuing fish stocks. But, there is no unified method of estimating stocks among states that share fishery resources. Moreover, developing countries such as Albania have not implemented a real system of production data on their biological, economic, social, basic ecosystems for fisheries as well as from fish trade or processing or manipulation. As long as there is no budget dedicated to research and a well-implemented legal and control basis there is no talk of unifying the GFCM for stock valuation policies. In the Bay Area of Vlora there is no valuation of stock in the area. What is known and clearly perceived is downward fishing.

The lack of connection between fish assessment and their management is the main problem for Mediterranean/Albanian fisheries (Vlora included).

4. Fishery activities implemented in the area

4.1 The fishing methods used

In the area of Vlora are exercised a variety of fishing activities and forms, aquaculture as well. It is the area where the beauty of the landscape is complemented with environmental assets of waterfront land, where the existence of a wide variety of wildlife calls for protection and carefully handling with them.

Fishing activities are equally with the same variegation in the area.

Artisanal fisheries have the roots of traditions since in ancient time and the coastal communities have inherited that skills generation to generation.

Here can coexist the artisanal or traditional fishing, entertainment or leisure fishing, sport fishing with the industrial, (pelagic or bottom trawl). Marine aquaculture by intensive floating cage has not damaged this coexistence, at least, as long as there is not an uncontrolled expands

of the aquaculture sites or unmonitored for the impact of irreversible environmental effects that can cause.

Table 2. Licensed Fishing Vessels In Vlora (2018)

NR	Vesel Name	Fishing Form
1	GABRIEL	Trawler
2	ODISEA 1	Selective
3	MEHMETI	SELECTIVE
4	GJYZELI	TRAWLER
5	DIAMANTE	SELECTIVE
6	DENIS	TRAWLER
7	XHOKLA	TRAWLER
8	KLODI 1	TRAW.+PELAG.
9	RICIOLA	TRAWLER
10	OQEANIA	TRAW.+PELAGIC
11	MELISA	TRAWLER
12	DE RADA	TRAWLER
13	FABIANO	TRAW.+PELAGIC
14	GERTA	TRAWLER
15	FIORE	TRAWLER
16	FORTUNELA	TRAWLER
17	ANDI II	TRAWLER
18	PAVARSIA	TRAW.+PELAGIC
19	KELI	SELECTIVE
20	SELMAN LEVANI	TRAW.+PELAGIC
21	ROZETA	SELECTIVE
22	AQCUARIO II	TRAW.+PELAGIC
23	RICIOLA 1	TRAWLER
24	DEVI	TRAWLER
25	MEDI	SELECTIVE
26	SULEJMAN HASANI 1	TRAWLER
27	ERIKLA	TRAWLER
28	LEDA	SELECTIVE
29	IL-PU	TRAWLER
30	POJANI	RRETHIME
31	RIGELS	TRAWLER
32	ELTJON	TRAWLER
33	LUCO-1	TRAWLER
34	PADAJ	SELECTIVE
35	BABALE	RRETHIME
36	AGIMI	RRETHIME
37	BISTRICA	RRETHIME

38	ORGESTI	PELAGICAGJIKE
39	LA SPERANCA	TRAW.+PELAGIC
40	KRISTO	TRAWLER
41	MIKAEL	TRAW.+PELAGIC
42	KARABURUNI	TRAWLER
43	QEPAROI	SELECTIVE
44	MUHARREM REXHO	TRAWLER
45	BABALE II	RRETHIME
46	AGIOS NIKOLAOS 2- HIM	SELECTIVE
47	LINDA	TRAWLER
48	ARDIT	TRAW.+ PELAGIC
49	SHANIKO	Trawler
50	ARDIANO	TRAWLER
51	AMERIKA	Trawler
52	ACQUARIO 4	TRAW.+ PELAGIC

Source: Fishery inspectorate of Vlora

Those with yellow highlight are of artisanal fishing (only them licensed) and potentially to fish within Vlora Bay.

It is a big number of Artisanal fishing, fishers and boats that are unlicensed, acting illegally fishing practices.

4.2 Fish depletion, assessments and related problems and impacts

Vlora bay has been from years under protection consideration from bottom trawl and pelagic fishing activities for the high environmental value that the area carries itself, but above all, for high positive effects on the maintenance and regeneration of the stock of some important marine reserve species in the area

Indeed, has not been fulfilled yet any real assessment of the fish reserve status on the area as well as fish stock or group stocks evaluation. On the other hand there is no assessment of fish production, yearly tendencies since no accurate statistical data's applied during last 25 years. To conclude on the tendency (decreasing or increasing) fish production must be implemented the accurate statistics over the years of all fishing impact on a stock or group of stocks, including the clear perception of the dimension of illegal, unreported and unregulated fishing activities in a selected area. If the legal aspects can be considered rather well we cannot say the same for their application in the field and moreover for inter-institutional cooperation.

4.3 Ilegal fishery activities occurring in the area

Continuously has been reported for the illegal bottom trawl within the Gulf of Vlora. Moreover, the illegality of the fishery activities is not only within the bay but is extended

outside the Gulf of Vlora, caused not only from the National operators but even from foreigner, mostly from Italian vessels. Some of them are evidenced, processed but never penalized. If we analyze the fishing fleet according the structure of them we can declare that only about 90% of professional fishing boats are licensed and registered in the National Fishing Fleet. When speaking for the artisanal fishery and Small Scale Fisheries less than 30-40% of them are licensed and or registered. So, the non licensed categories don't report and is out of monitoring for their activity and fish production. And the result comes directly in the fishing nets of the legal fishermen community which are landing fewer and fewer fish.

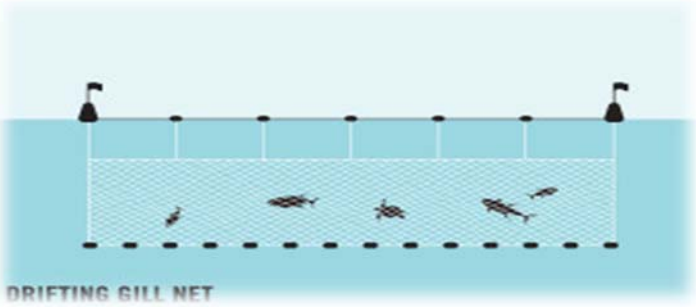
What are the mostly illegal of activities identified in the area?

Illegal Fishing which means fishing without license/Authorization, fishing in the prohibited areas, prohibited fishing gears and/or with smaller mesh size, by exterminator means, irregular fishing and with bad practices that results unfavorable for the fish reserve in area, that harm/mismanage the coastal lagoons with which the coast of Vlora is rich and the role of lagoons is irreplaceable to the fish resources.

Another kind of lawbreaking is the fishing practice by diving equipped with compressor. This has led not only damages the target fish but this kind of fishing is associated with the exploration and exploitation of corals, sponges, sea cucumbers, species prohibited by law and by which Vlora coast is rich.

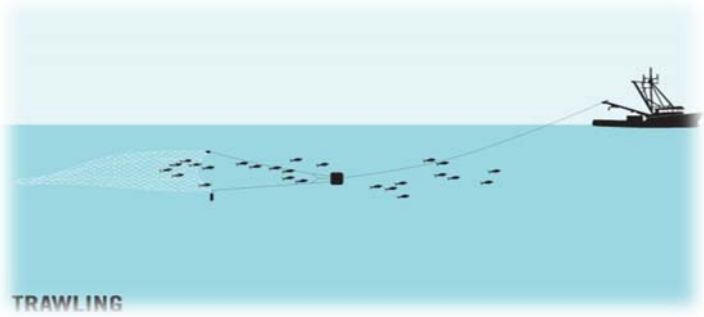
The coast of Vlora is rich on a variety of ecosystems which are not studied enough; such ecosystems appreciated for their combination of their impact on the maintenance and regeneration of fisheries resources. Empiricism and irresponsibility have accompanied economic activities in this area, which is so rich environmentally and of diverse.

Gillnets are sets of panels of uniform mesh size, which form a large net-wall hanging vertically in the water. Suspended in the top- or mid-depths of the water (a drift gillnet), or anchored to the seafloor (bottom gillnet), gillnets trap fish by their gills. They are very effective – and particularly destructive.



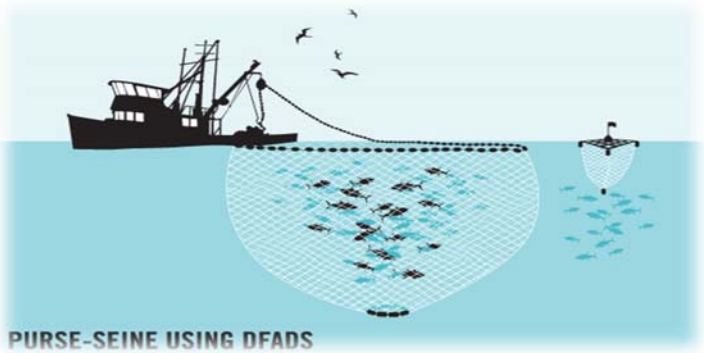
Trawling involves dragging a large fishing net with heavy weights behind a boat, either mid-water or across the bottom. The net indiscriminately catches or crushes everything in its path. Consequently, by-catch is extremely high and nets are often lost due to snagging on the bottom.

Trawling is a common fishing technique. **It is forbidden to trawl within Vlora Bay.**



Purse seine is a long wall of netting deployed around a school of fish and pulled tight, thus enveloping the school of fish (and any other animals) in a purse-like structure.

Purse seines target pelagic fish of all sizes, including tuna, and are therefore frequently used in the western Indian Ocean, often in combination with FADs (see below)



On the other **hand, pole and line**, are other traditional fishing technique associated with a low impact and **is sustainable fishing technique**.

5.Situation Description and Assessment: Collection of data from fishermen

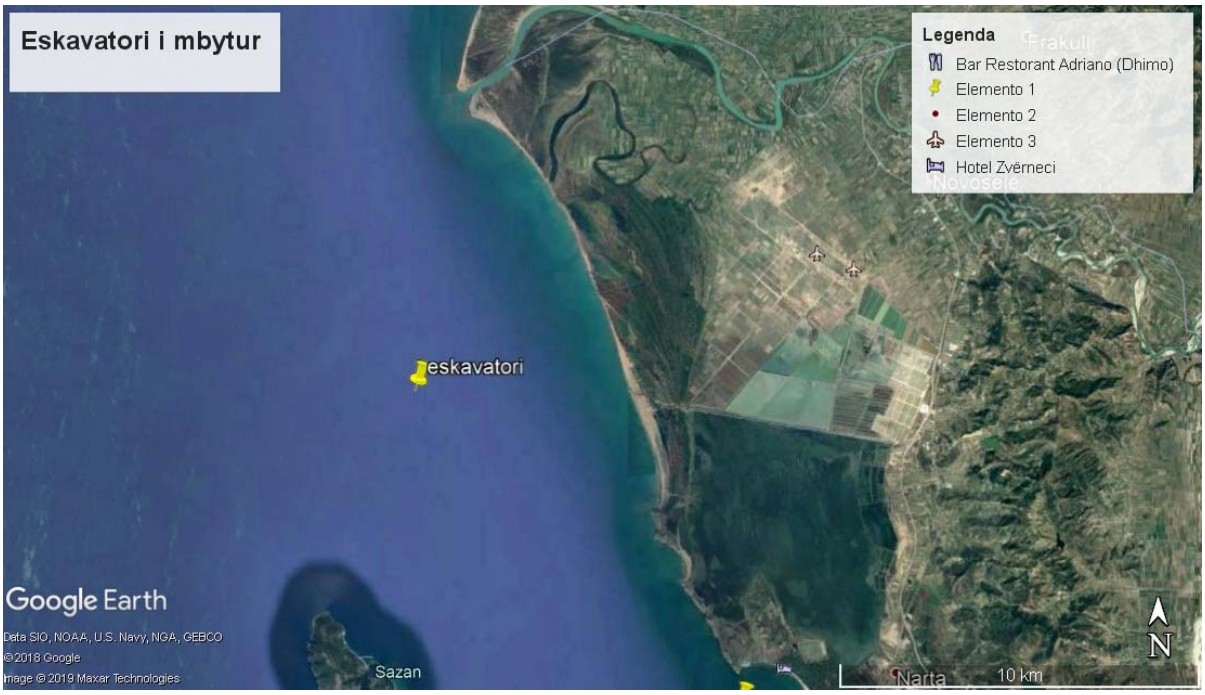
Abandoned, Lost or otherwise Discarded Fishing Gear: is a significant and persistent form of marine litter. ALDFG threats to marine habitats and wildlife (e.g. entanglement and 'ghost' fishing, digestion, etc.), human safety (e.g. divers, boat crews, etc.) and property damage (e.g. damaging propellers).

In most cases, the loss of gear from fisherman from vlora are unwanted by the fisherman but in some cases fishing gear is intentionally discarded, mostly to avoid the waste management cycle and related cost or efforts.

2 experts: Jerina Kolitari and Mimoza Cobani travelled to Vlora coastal area to have a conversation with different group fishermen in regard of best practices on fishing, on fishing methodologies used in Vlora Bay, on coastal ecosystem and marine ecosystems in general, on environmental and biodiversity aspects, fish resources and preserving a healthy sea conditions, what are the ghost nets, the relationship of ghost nets with the seabed condition, their economic and new-technologies challenges related to fishing and for ghost-fishing tracking and tackling, how to deter and select the areas where are accumulated ghost nets, the causes and factors, etc.

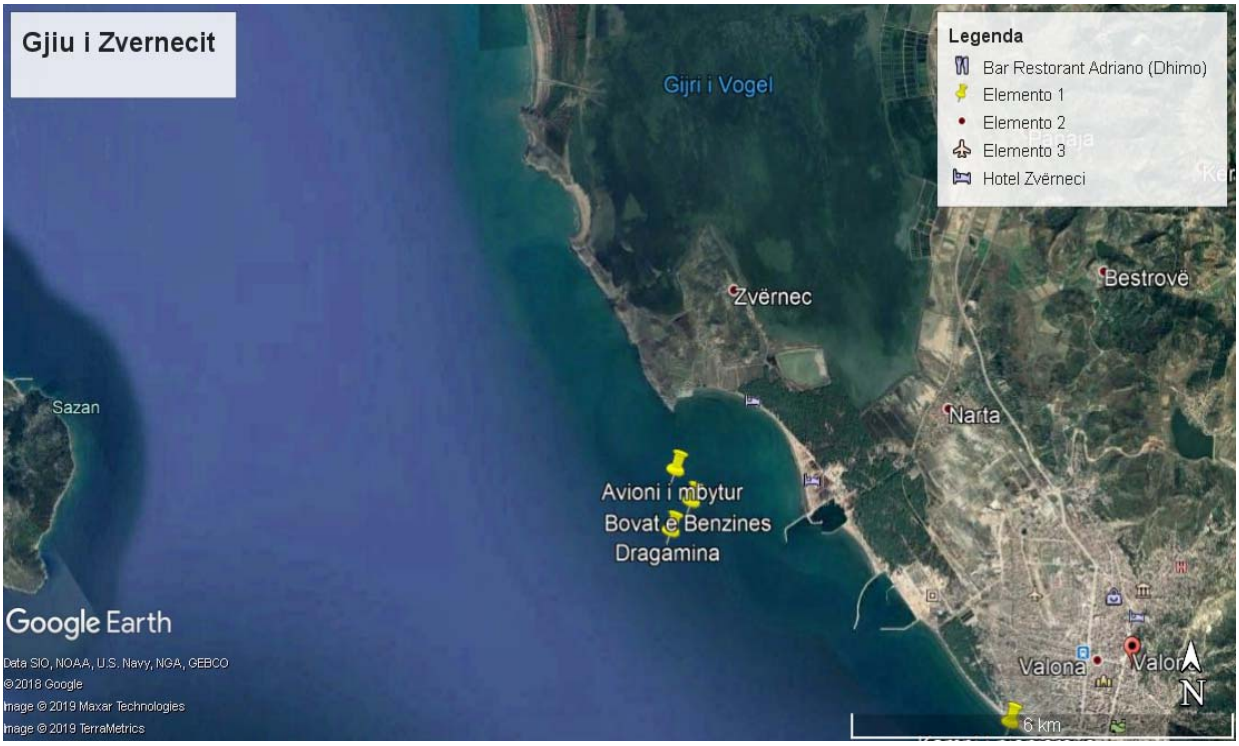
The mostly concentrated areas with ghost nets (lost or abandoned) are:

- **Place**: The ship drowned in the sea in 1940 year, depth 12 m (distance from the cost 1 km.
- **Place:** Spitalieri (the Hospital ship is drowned in the sea 1943 year), depth 32 m, distance from the cost 1,5 km.
- **Place:** Mermeri (Marble), depth 45 m, distance from the cost 3 km.
- **Place :** Shengjan (two drowned ships during Second War), depth 30m, distance from the cost 2 km.
- **Place:** "Eskavatori i mbytur": An area between Vjosa River mouth and Sazani Island.

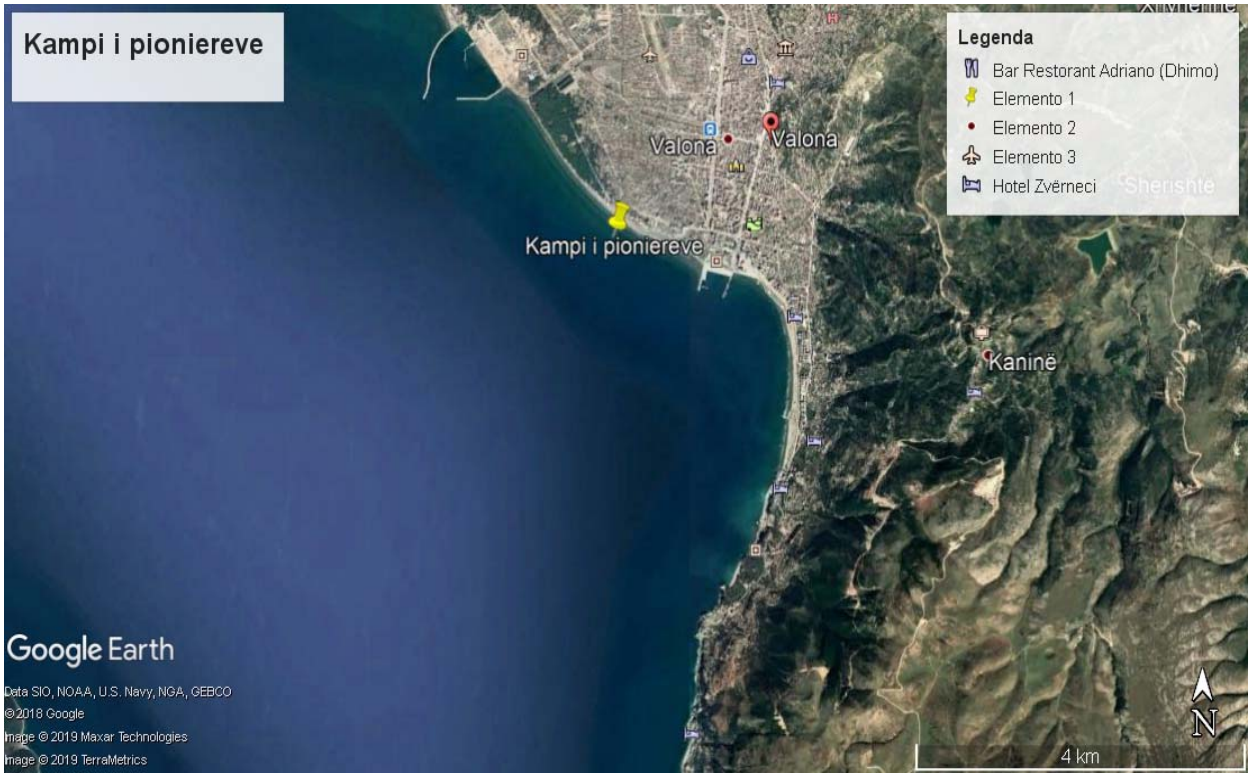


-Place: ***Zverneci Bay***, where we put together three topics: "***Dragamina"***, "***Avioni i***

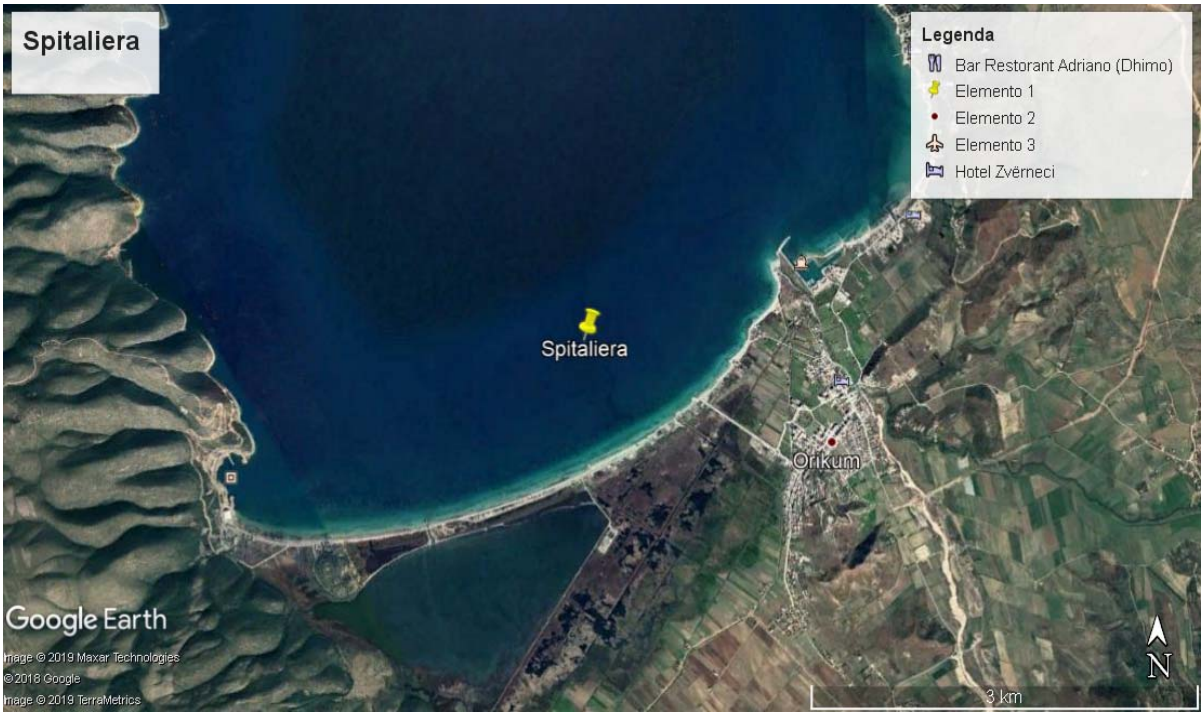
mbytur" and "***Bovat e benzines"***



-Place: *Kampi i pionierеve*. It is a site near Vlora city.



-Place: Spitaliera. It is an area near Orikumi city and the Orikumi Lagoon.



-Place: *Marble Bay*. It is an area that is in ***Karaburuni Bay***.

-Place: *Cave of Haxhi Akiut* (Shpella e Haxhi Aliut). It is an area in the ***Karaburuni Cape***

Those were a sites selected, according the conclusion from conversation with fishermen. The further selection, deterring three sites to used to clean from the ghost nets abandoned, (in the frame of this project) will be to Vlora Regional Council representatives to choose those three areas amongst the above sites.

In regards of the fishing trips and fishing routes we should stress that Vlora Bay is a Protected Area and according to its protection status and the Fishery Low Nr. 64 of date 31.05 2012 "On Fisheries", it is prohibited to apply Bottom Trawl Fishing on the Vlora Bay. In such condition we should say definitely that almost all fishing form applied in Vlora Bay is Artisanal Fisheries. This fishing form don't use fishing port facilities, they are based on capillary way along the sea coast. Some of the artisanal fishing boars we meet in the Treport Fishing Port.

6. Some important points to consider regarding ALDFG

- Collecting data, through interviews and questionnaires, from fishermen, scuba-divers, etc. to identify the accumulation areas of ALDFG is very important.
- Establishing a database with the identified locations and adding locations on a chart
- Establish contact relevant local authorities regarding the recovery activities in order to have support on the ground

Recovery actions:

- Establish a panel for action (team members),

- Deploy a good communication strategy,
- Get equipped vessel(s) and other equipment,
- Fulfil all precaution obligations required to obtain approval for the actions.

Management and storage on the land:

- Identify a site on land as the preliminary storage area
- their direct impact on the marine biodiversity remains completely unknown
- fisheries that deploy unattended gear like gillnets or trammel-nets were the primary source of ghost-nets,
- these nets are used especially near the coasts in rocky habitats (underwater ridges) characterised by high biodiversity and continue to fish species of high economic value.
- however, lots of them are fairly fouling and lie on the seafloor (older ones) potentially posing less threat to biodiversity
- lost fishing gear continue to trap fish 'unintentionally' also of particularly endangered and protected species,
- fish and crustaceans such as red scorpionfish and lobsters are endangered by lost fishing gear - an additional risk for several crustacean and fish species of conservation concern like Palinuruselephas and Scorpaenascrofa, respectively.
- operational challenges of locating, recovering and disposing of removed nets,

since the serious damage caused by ghost nets to the fisheries sector has not been assessed, the difficulty lies in convincing target groups to take an action for net removal.

6.Discussions regarding the analytical results performed

The most delicate phenomena of marine coastal water pollution in past years in Vlora Bay were heavy metal pollution (mainly metallic mercury from past discharges of a soda plant near the city of Vlora) and organochlorine pesticides (OCs). Moreover, urban waste is dumped into the sea without any treatment. In Albania, OCs were mainly used as insecticides such as dichlorodiphenyltrichloroethane (DDT), hexachlorobenzene (HCB), and lindane before 1990. As a result of recent transformations in agriculture, pesticide use has generally declined after 1990. From year to year, the distribution of PCBs has changed in favor of less volatile technical mixtures (such as Aroclor 1260), indicating a ground-based contribution, probably due to the importation of contaminated transformer oils or their malfunctioning existing.

No data have been available on the levels of those pollutants in biota from the coastal areas of the Gulf of Vlora until 2010

Implementing decisions on actions to monitor and evaluate marine pollution, in coherence with all partners, the AUT carried out analytical testing for: heavy metals was

measured in 86 cefalopodes samples (54 samples sepia.spp + 32 Loligo spp), polychlorinated biphenyls (PCBs) and organochlorine pesticides (56 samples), residues of antibiotics (68 samples) in fish were measured in fish. PcBs and heavy metals were measured in 2 samples, and PCBs in 2 sediments samples (Table 3)

OC pesticides and PCB were found to be below the detection limit, in fish, water and sediments. Overall, the results show an environmental quality of the Bay of Vlora, which similar to those a marine protected area.

In fact, what is to be discussed is that in the past years Hg levels have been problematic as a result of the of past industrial activities (especially soda plant discharges), those over the years, after its closure have improved significantly. Analyzes of antibiotic residues in fish also show satisfactory results

The results of analysis performed in samples fish, cefalopodes and water from Vlora Bay also support its suitability in environmental quality assessment of marine coastal areas.

Table 3 Analyzes performed by type of samples / parameters / analyzes - Vlora Gulf

Samples types	No. samples for testing:	No. performed analyzes	Parameters	**Method**
Cephalopods (*Octopus* spp. And/or *Sepia* spp. And/or *Loligo* spp.)	**80**	**86** **54** *sepia.spp* **32** *Loligo spp*	**Heavy metals (Pb, Cd , Hg)**	GC-MS/MS (POS 10-PSH-011)
Fish (Boops boops, Mullus barbatus, other demersal fish	**30**	**56** **22** Boops boops, **26** Mullus barbatus, **8** other demersal fish	**Pesticides (Organophosphates and Carbamate)**	GC-MS/MS (POS 10-PSH-012)
Fish *(Spaurus aurata, Dicentrarchus labrax)*	**40**	**68** **45** *Spaurus aurata* **23** *Dicentrarchus labrax*	**Antibiotics**	immunoenzymatic assay ELISA
Fish *Spaurus aurata, Dicentrarchus labrax*	**40**	**150** **30** ***Spaurus aurata*** **20** *Dicentrarchus labrax* 100 other	**Microplastic**	Stereomicroscope (protocol for macrolitter ingestion by fish)
Water	**2**	**2**	**PCBs**	GC-MS/MS (POS 10-PSH-011)
Water	**2**	**we couldn't make it**	**PAHs**	
Water	**not required to be analyzed**	**2**	**Heavy metals (Pb, Cd , Hg)**	GC-MS/MS (POS 10-PSH-011)

Sediments	**2**	**2**	**PCBs**	GC-MS/MS (POS 10-PSH-012)
Sediments	**2**	**we couldn't make it**	**PAHs**	

Below you will find the results obtained for the parameters / analyte in the respective tables

Table 4. Heavy metals in cefalopodes (Pb, Cd, Hg)

Method used: GC-MS/MS (POS 10-PSH-011)

Nr Samples	Parameters	Analyte	Unit of measure	Results
51 ***sepia.spp***	Heavy metals	Pb	mg/kg	<0.06
		Cd	mg/kg	<0.02
		Hg	mg/kg	<0.1
3 ***sepia.spp***	Heavy metals	Pb	mg/kg	<0.06
		Cd	mg/kg	<0.02
		Hg	mg/kg	0.12
23 ***Loligo spp***	Heavy metals	Pb	mg/kg	<0.06
		Cd	mg/kg	0.12
		Hg	mg/kg	<0.1
9 ***Loligo spp***	Heavy metals	Pb	mg/kg	<0.06
		Cd	mg/kg	<0.02
		Hg	mg/kg	<0.1

Table 5 Analyzes performed for pesticides in fish

Method /Reference GC-MS/MS (POS 10-PSH-012

Parameters	Analyte	Unit of measure	Results
Organochlorine	Aldrin	mg/kg	< 0.01
Organochlorine	Dieldrin	mg/kg	< 0.01
Organophosphorus	Chlorpyrifos	mg/kg	< 0.01
Organophosphorus	Chlorpyrifos-methyl	mg/kg	< 0.01
Organophosphorus	o,p´-DDT	mg/kg	< 0.01
Organochlorine	p,p´-DDT	mg/kg	< 0.01
Organochlorine	p,p´-TDE (DDD)	mg/kg	< 0.01
Organochlorine	p-p´-DDE	mg/kg	< 0.01
Organochlorine	Diazinon	mg/kg	< 0.01
Organochlorine	Endrin	mg/kg	< 0.01
Organochlorine	Heptachlor	mg/kg	< 0.01
Organochlorine	Heptachlor epoxide	mg/kg	< 0.01
Organochlorine	Hexachlorobenzene	mg/kg	< 0.01
Organochlorine	Hexachlorocyclohexane (HCH), alpha-isomer	mg/kg	< 0.01
Organochlorine	Hexachlorocyclohexane (HCH), beta-isomer	mg/kg	< 0.01
Organochlorine	Hexachlorocyclohexane (HCH), delta-isomer	mg/kg	< 0.01
Organochlorine	Lindane (Gamma-isomer i Hexachlorocyclohexane (HCH))	mg/kg	< 0.01

Organochlorine	Methoxychlor	mg/kg	< 0.01
Organochlorine	Mirex	mg/kg	< 0.01
Organophosphorus	Pirimiphos-methyl	mg/kg	< 0.01
PCB	PCB_28	ng/g	< 5
	PCB_52	ng/g	< 5
	PCB_101	ng/g	< 5
	PCB_138	ng/g	< 5
	PCB_153	ng/g	< 5
	PCB_180	ng/g	< 5

Table 6 Analyzes performed for residues of antibiotics in fish

Method /Reference: immunoenzymatic assay ELISA

Nr. of samples	Sample types	Substance (Antibiotic)	Unit of measure	Results
45	***Spaurus aurata***	Sulfonamide	ug/kg	It was not found
		Sulfamethazine	ug/kg	It was not found
		Oxytetracycline	ug/kg	It was not found
		Quinolone	ug/kg	It was not found
		Chloramphenicol	ug/kg	It was not found
		Nitrofurazone (SEM)	ug/kg	It was not found
		Furaltadone (AMOZ)	ug/kg	It was not found
		Furazolidone (AOZ)	ug/kg	It was not found
23	***Dicentrarchus labrax***	Sulfonamide	ug/kg	It was not found
		Sulfamethazine	ug/kg	It was not found
		Oxytetracycline	ug/kg	It was not found
		Quinolone	ug/kg	It was not found
		Chloramphenicol	ug/kg	It was not found
		Nitrofurazone (SEM)	ug/kg	It was not found
		Furaltadone (AMOZ)	ug/kg	It was not found
		Furazolidone (AOZ)	ug/kg	It was not found

Biota

There were small variability of different microparticles found in all species of fish, since we found only filaments and smaller fragments. We didn't expected to find so many filaments in fish gut, but this result is in correlation to high abundance of filaments in sea surface samples. There is also difference in number of filaments and fragments, which we can correlate to the specific fish feeding habits. Therefore we found the most microparticles, mostly filaments, in Pagellus Erythrinus that feeds low in the foodchain, It is omnivorous, but mainly feeds on smaller fish and benthic invertebrates either as direct primary consumers and detrivores, or at a secondary level feeding on small macrofauna, what means it eat on the shallow bottom floor and on the sea surface, preferably near waste waters and marinas. The least of microparticles we extracted from the gut of Solea soleaspecimen, which lives and feed mostly on the sea floor, were is not so much exposed to floating filament and fragments in the water column.

Table 7 Microplastic (qualitative assay)

Method used: Stereomicroscope (protocol for macrolitter ingestion by fish)

SPECIES		Nr. of analyzed samples	Microplastic		%
			Stomac	Intestine	
species selected for study by ADRINET	*Spaurus aurata*	30	4	2	20%
	Dicentrarchus labrax	20	3	2	25%
other species analyzed	*Mullus Barbatus*	20	3	2	25%
	Triglia Lucerna	20	1	1	10%
	Solea Soolea	20	2	2	20%
	Trachurus Mediterraneus	20	7	4	55%
	Pagellus Erythrinus	20	1	1	10%
	Sardina Pilcardus	20	2	1	15%
	Total	150	16	11	23%

Table 8 PCBs in Water

Method used: GC-MS/MS (POS 10-PSH-011)

Parameters	Analyte	Unit of measure	Results
Organochlorine	Aldrin	µg/L	< 0.05
Organochlorine	Dieldrin	µg/L	< 0.05
Organophosphorus	Chlorpyriphos	µg/L	< 0.05
Organophosphorus	Chlorpyriphos methyl	µg/L	< 0.05
Organophosphorus	Diazinon	µg/L	< 0.05
Organochlorine	Endrin	µg/L	< 0.05

Organochlorine	Heptachlor	µg/L	< 0.05
Organochlorine	Heptachlor epoxide	µg/L	< 0.05
Organochlorine	Hexachlorobenzene	µg/L	< 0.05
Organochlorine	Hexachlorocyclohexane (HCH), alpha-isomer	µg/L	< 0.05
Organochlorine	Hexachlorocyclohexane (HCH), beta-isomer	µg/L	< 0.05
Organochlorine	Hexachlorocyclohexane (HCH), delta-isomer	µg/L	< 0.05
Organochlorine	Lindane (Gamma-isomer i Hexachlorocyclohexane (HCH))	µg/L	< 0.05
Organochlorine	Methoxychlor	µg/L	< 0.05
Organochlorine	Mirex	µg/L	< 0.05
Organochlorine	o,p´-DDT	µg/L	< 0.05
Organochlorine	p,p´-DDT	µg/L	< 0.05
Organochlorine	o,p´-TDE (DDD)	µg/L	< 0.05
Organochlorine	p,p´-TDE (DDD)	µg/L	< 0.05
Organochlorine	o,p´-DDE	µg/L	< 0.05
Organochlorine	p-p´-DDE	µg/L	< 0.05
Organochlorine	o,p´-DDT	µg/L	< 0.05
Organophosphorus	Pirimiphos-methyl	µg/L	< 0.05
Bifenils PCB	PCB_28	µg/L	< 0.05
	PCB_52	µg/L	< 0.05
	PCB_101	µg/L	< 0.05
	PCB_138	µg/L	< 0.05
	PCB_153	µg/L	< 0.05
	PCB_180	µg/L	< 0.05

Table 9 Heavy metals in water (Cd, Pb, Hg)

Method used: GC-MS/MS (POS 10-PSH-011)

N r.of samples	Pb(mg/L)	Cd (mg/L)	Hg (mg/L)
P-1	<0.005	<0.005	<0.005
P-2	<0.005	<0.005	<0.005

Table 10 PCB in sediments: 2 samples

Metoda/Referenca GC-MS/MS (POS 10-PSH-012)

Parameters	Analyte	**Unit** of measure	Results
PCB	PCB_18	mg/kg	< 0,002
	PCB_28	mg/kg	< 0,002
	PCB_52	mg/kg	< 0,002
	PCB_44	mg/kg	< 0,002
	PCB_101	mg/kg	< 0,002

	PCB_138	mg/kg	< 0,002
	PCB_153	mg/kg	< 0,002
	PCB_180	mg/kg	< 0,002
	PCB_194	mg/kg	< 0,002

7. Recommendations for improving enforcement, controls and fishery regulations.

To improve enforcement of fishery structures it is important starting communications, legislation analyzing, building a common operational plan, upholding a task force structure for each MPA. (Management Protected Area)

There are regional organizations with which Albania has a very dynamic and fruitful collaboration. This is GFCM and all policies are oriented in the management of fishery resources, conservation, sustainable and responsible use of them. GFCM recommend and is asking from member countries to proclaim as much as possible Marine Protected Areas. Taking into consideration such regional organization and building a good communication especially in exchanging information would be useful.

8. Proposed measures for a sustainable Small Scale and Artisanal Fisheries outside the borders of MPA-s and for increasing the fish population in the area.

Small Scale Fisheries in Albanian fleet and fishing reality is mostly defined Artisanal/Traditional Fishing. This fishing fleet segment represents the small boats with 5-40 HP that fish no more than 3 NM from the coast, with around 100-120 fishing days per year, with small incomes only for daily consume. The artisanal boats don't use a fishing harbor, so are not easy to be monitored. Mostly of them are not licensed, so they don't report their catches. It is rather familiar activity where women give a good contribution. This kind of fishing is rather marginalized, neglected but it is a big reality in Albanian fishery and Vlora also.

In the outside borders of MPA-s this kind of fishing should be more attractive for operators, so, became most imperative knowing that situation through evaluation of the number of boats, their production per fishing day, the legality of their activity by the purpose of differentiation from the legal operators. With the legal operators should be built a healthy partnership with MPA-s administrators.

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