



creatures in the marine aquatic environments. These effects can be accumulated in the marine and terrestrial food chain endangering human health.

Also in this area (figure 1), pollution is accumulated due to the long use of oil extraction and the lack of plans for the management of environmental impacts. The obsolete and amortized

technology is another factor that has contributed to the pollution of the area from hydrocarbons.

The industrial activities in this area have to do with the tracking or research and exploitation of oil and natural gas. At the peak of production, there were developed 338 wells in the northern zone and 123 wells in the southern zone for a total of 461 wells [9].

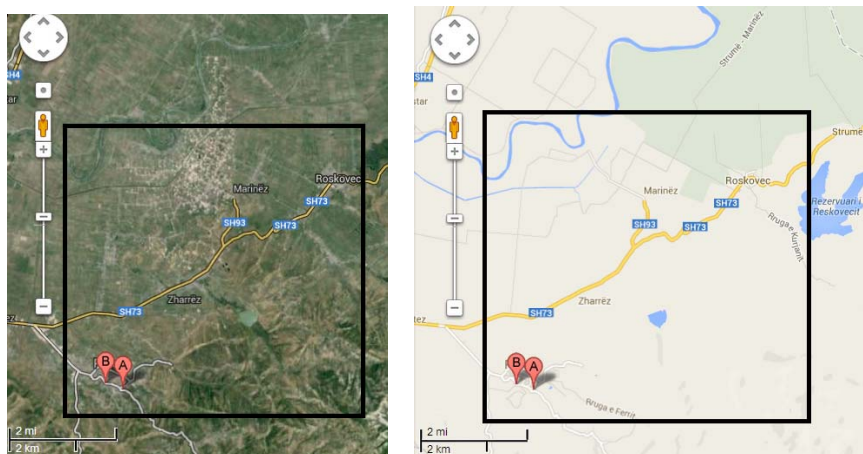


Figure 1. Satellite view of the study area

Table 1. Data for the territory of the area affected by the oil industry activity [9]

Form of the land use (ha)						
A	B	C	D	E	F	
Ballsh Municipality	27,77	-	3,12	10,72	-	10,99
Patos Municipality	2,434					
Roskovec Municipality	1,157	57	-	-	-	20
Bubullimë Commune	2,878	42	-	-	-	-
Cakran Commune	4,371	111	-	1,626	1,497	-
Kolonja Commune	2,833	-	-	32	-	-
Krutje Commune	3,781					
Kuman Commune	2,281	89	110	15	36	82
Mbrostar Commune	3,280	-	-	69	-	-
Portëz Commune	2,104	-	55	284	21	-
Qendër Commune	3,858	256	42	40	-	33
Zharrez Commune	2,090	2,090	36	77	336	721
Ruzhdie Commune	1,093	29	3	284	285	648

-721

A- farmland; B-land; C- meadows; D-forests; E- pastures; F-not productive

The area under study is one of the most important agricultural areas of the country. Agricultural activity accounts for about 60% of economic activity in the area.

### 2.2. Identification of environmental aspects

*Leaks from the mouths of wells.* In general, oil extraction wells during the work process cause environmental pollution. This situation results due to the bad hermetization of well mouths, therefore there are leaks in more than 50% of them. Oil and water

layer leaks from the well hole. A part of the oil coming from the mouth well spreads into the surrounding environment, while the other part goes into the hole of the well, which is a simple soil hole destined to accumulate fluids. The number of holes is equal to the number of wells on activity. In the rainy season, the water level in these holes rises and oil goes outside it, polluting the surrounding environment or passing into the irrigation and drainage canals and phreatic water.

*Oil storage in reservoirs.* The oil is stored in open reservoirs from which hydrocarbons evaporate. In this area is felt a strong odor from the high presence of hydrogen sulphide in the air. If inhaled for a long time, it can cause headaches and respiratory disorder.

*Emissions from Ballsh Processing Plant.* The plant discharges large quantities of oil in the environment, particularly in Gjanica River. One of the causes of the oil spill on the environment is that polluted wastewater plant is not treated to function properly.

*Fluid accumulation groups.* Another potential source, which causes environmental pollution are also fluid accumulation groups. These are distributed throughout the oil field sites. These groups serve for the development of gas separation process from oil and a portion of the water layer. Currently, in most of the groups, the gas separators are not in working condition, and the accompanying gas is discharged into the atmosphere, causing its pollution.

*Defects and accidents.* Environmental pollution is caused by defects that occur in gas or oil pipelines, which are associated with cracks or ruptures, thus discharging gas or oil into the environment.

### 2.3. Identification of spontaneous fauna in the area under study

The dominant species are *Glyceria plicata* dhe *Sparganium erectum* which are accompanied by: *Glyceria fluitans*, *Juncus effusus*, *Nasturtium officinale*, *Veronica beccabunga*, *Callitriche cophocarpa*, *Apium nodiflore*, *Bidens tripartita*, *Apium nodiflorum*, *Catabrosa aquatica* etj

In addition, there is identified the presence of the following species: *Brachypodium ramosum*, *Ruscus aquileatus*, *Asparagus acutifolius*, *Teucrium polium*, *Cistus incanus*, *Cistus salviafolius*, *Bellis perennis*, *Smilax aspera*, *Dactylis glomerata*, *Poa bulbosa*, *Micromeria juliana*, *Cynosurus echinatus*, *Pistacia lentiscus*, *Paliurus spina-christi*, *Pyrus amygdaliformis*

, *Quercus ilex*, *Arum italicum*, *Cynodon dactylon*, *Anthoxanthum odoratum*, *Briza maxima*, *Chrysopogon gryllus*.

The accompanying species with high value of coverage amount are represented by: *Typha angustifolia*, *Lythrum salicaria*, *Cladiummariscus*, *Alismaplantago-aquatica*, *Sparganumerectum*, etj.

### 2.3. Pollution pressure on spontaneous flora

The effect of a substance on an organism or creature is determined by the bio-availability. Bio-availability means the ability of a substance to enter or penetrate the body of a living creature. Furthermore, bio-availability is dependent on physical-chemical properties of the substance. Water solubility is a feature that affects bio-availability [2].

Chronic effects occur when the body is exposed to a low concentration for a long period of time. The effects may be different; growth reduction, anomalies, reproduction or production reduction etc., [4; 6].

Pollution can affect the distribution of species in the affected area. Some species may be more sensitive than others towards oil pollution. Some species may be reduced in number or disappear from the polluted areas. Other organisms may be more tolerant towards oil being able to colonize and dominate the contaminated areas [11].

From time to time, as a result of technological processes of oil wastes, significant oil quantities are discharged in Gjanica. The presence of high level of pollution has caused serious consequences on the flora and fauna of this area. This oil has not only changed the color of the river, where occasionally oil stains the entire surface of the water, but also the vegetation that once accompanied this watershed.

The plant leaves identified in the polluted site are covered with insects Necrosis is another symptom on the leaves of spontaneous plants observed under the effect of the pollution.

**Table 2.** Fluorescence parameters and photosynthetic activity in some species

Plant	Fluorescence parameters			Photosynthetic activity		
	Fo	Fm	Fv	Rfd	qN	NPQ
Ph. australis	126.7	357.2	230.58	1.479	0.855	1.087
Ph. australis	120.01	362.91	242.9	1.552	0.834	1.124
E.camaldulensis	159.94	640.33	480.39	1.786	0.856	1.718
E. camaldulensis	132.79	601.69	468.9	3.072	0.922	2.737
Ph.australis	110.99	509.71	398.72	3.043	0.94	2.583
Ph. australis	163.65	774.58	610.93	1.806	0.793	1.639
E. camaldulensis	124.46	459.3	334.84	1.557	0.856	1.186
E. camaldulensis	122.59	415.09	292.49	1.411	0.822	0.995



