

ENVIRONMENTAL IMPACT OF INDUSTRIAL DEVELOPMENT IN THE SOUTHWEST ALBANIAN REGION

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ABSTRACT

The industrial development in Albania was transformed into a priority in economy after World War II, accompanied with the construction of several plants and factories. Through the five year state plans it was aimed at applying and developing a wide – ranging industry. This brought to the development of the chemical industry, mechanical industry, light industry, food industry etc. The technologies applied in this Albanian “industrial revolution” were taken from the European Eastern countries or China, places with which Albania had closer cooperation relations. In most cases these technologies were not up to date or even in contrary cases, there were no periodical investment made on their renovation and maintenance with the passing of time. With the fall of the communist regime in the country, these technologies were transformed from industries supporting the economical development, into impeding industries and even causing environmental pollution.

This article focuses on the appraisal of the interdependence through the industrial development and the natural environment in the southwestern region of Albania. The article analyses in further detail the present state in the district of Fier, the causes of contamination engender and it also tries to emphasize the precautions to be undertaken in order to reduce pollution. Air pollution, water pollution and soil pollution, are all factors connected to oil development industry in this district, a factor that has deeply influenced the life quality of the inhabitants.

To conclude, solutions are presented to improve the pollution situation in these study areas. Some methods used in the study are: observation methods; comparative methods; analysis methods and prognosis methods.

Keywords: Industrial development; pollution generators; waste management; landfills; eco – solutions.

INTRODUCTION

This paper is focused on the Southwestern part of Albania and more specifically in one of the areas which have had a big industrial development, such as the Region of Fier. Despite the fact that this research is focused on regional level, it can serve to other researchers and can be taken in consideration for the research work n national level and maybe even in international level. Territory in the study has been one of the regions with intensive development of the industry, where we can mention: hydrocarbure extract industry, hydrocarbure processing industry (diesel, gas etc.); chemical industry (fertilizers of nitrates); energetic industry (Thermo central of Fier and Ballsh); light industry, food processing industry etc.

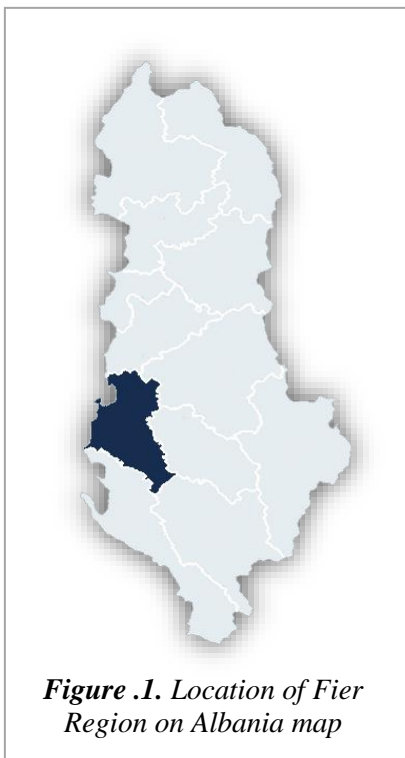


Figure .1. Location of Fier Region on Albania map

This article is focused on environmental impact have brought the development of this economic sector on the territory under this research study. Analyzing of environmental situation is done with the purpose to make evident environmental impact of these industries, which are clearly evident with a lot of environmental living creatures and human being health problems. More specifically this purpose had consisted in data collection on the site and the use of efficient methods, in order to introduce and analyze the impact of industry over the environment of this area.

Results which are taken out from this research work are used to give some conclusions and recommends in function of situation improvement in rapport with industrial development and natural environment. We think that these results will be valuable for the researchers, policy makers and inhabitants of this area themselves.

MATERIALS AND METHODS

Data for realization of this research are taken directly from the measuring on the site, from the data collected from institutions in national and regional level and through the use of different literature. Analyses of environmental parameters is done taking in consideration the basic standards and international units.

In order to realize the objectives of this research work are used some methods such are: method of observation, method of statistical data collection on the site, method of processing and that of evaluation, method of introducing and map analyzes through the use of GIS; comparative methods and method of prognosis.

INDUSTRIALIZING OF THE AREA AND PROBLEMS IN RAPPORT WITH ENVIRONMENT

Development of industry in Fier Region among the positive impacts had caused also negative impacts showed through environmental pollution. Among the evident problems the most emergent of environmental problems are:

1. Storage of Arsenic
2. Pollution caused from oil industry
3. Administration of stone and urban wastes
4. Pollution of TEC-s

As main generator of the above mentioned problems are evident:

Implant of nitrate fertilizations Fier. This implant has functioned from 1967- 1992, using as the raw material unprocessed oil with a high percentage of sulphur. After the economical structural changes of 1990, fertilization industry affected from the social economical and political transition and from the lack of supply with raw materials (as the result of difficulties to be supplied with natural gas) was not anymore competitive in the market and consequently did not functioned any more. Actually this important branch of chemical industry (nitrogenous fertilizer with high quality) is considered as bankrupt.

Non functioning of this implant which supplied with fertilizer the agriculture for many years it was accompanied with a non maintenance and abandoning of it. This brought showing of a very severe problem with a very high environmental risk which was related to the arsenic storages, which served as raw material for the production of nitrogenous fertilizers. Arsenic in this implant was deposited in steel barrels. From the water samples which were taken from the leaking of basements, was found arsenic with a concentration 97.7 mg/l and land samples there were arsenic concentration from 830 – 172.300 mg/kg [9]. (*In some Europeans countries like in Germany the allowed level of arsenic in industrial areas is 140 mg/kg.*). Due to some problems from the amortization in 2005 through a project, it was engaged the Italian Company “Selca”. According to this project has to be eliminated 850m³ arsenic, using the fund 1 million euro, given from European Community [1]. But this project did not give any result. Environmentalists in this period of time gave the alarm that if arsenic was going to be eliminated, the poison was going to be distributed in Gjanica river and later was going to end to Adriatic Sea. This was going to be a big ecological catastrophe not only for Fier but also for the rest of the country. The quantity of arsenic actually is deposited in a concrete basin, in order to be preserved from any possible leaking in the environment.

Fier is a very important industrial city but also a pollution base inherited from the past. In Fier and Ballsh are situated also two main refinery, which are functioning partially as the result of raw material lack. Also exists other polluted areas identified from UNDP [6], such are: Store room of pesticides in Lushnje- expired pesticides; plastic plant in Lushnje- 1700 ton toxic chemicals; Storage room of dangerous chemicals hospital Lushnje- 2 ton lindane and 13 barrels with toxic chemicals; Fertilizers plant Fier- 25 ton NH₃ (ammoniac) liquid. Risk level of these polluted area is average, meanwhile higher is showed at unprocessed oil factory Fier. Presences of industries which operate with an old technology have turned the Fier Region in one of the most polluted areas including it into the map of “hot areas”.

Oil fields in Patos – Marinzë. Patos is a small town but with huge economic resources, since represent the centre of oil industry, bitumen and chemical industry in Albania. Oil fields in Patos – Marinzë with 2000 wells, which produce 400 ton/day unprocessed oil, are one the biggest oil fields in Europe, with calculated reserves of 500 million ton. [1] This field is a pollution resource for air, land and waters and without doubt even for the inhabitants of Marinza, which are exposed toward the serious health risk. This as the result of pump bad maintenance, which leak and pollute the environment. Industry which is up to a certain level is controlled by the state has been reconstructed in order to privatize and turn it attractive for the foreign capital.

Oil areas in this region, despite the fact that some of them are privatised, still have pollution problems. The wells privatized by Canadian company “Bankers,” is noticed to have again some leaking which polluting day by day agricultural terrain. One of the main aims of privatizing the oil wells from private companies has been minimizing of pollution and this has been also the cause of people revolts. From the conversations with inhabitants results that, is still the same bad situation despite people hoped to minimize the pollution. According to them this pollution continues affecting the quality of agriculture land.

Oil refinery Ballsh. TEC of Ballsh produce 300000 ton oil per year. This refinery discharge huge amounts of oil in the environment round 22590 ton per year, affecting potentially the pollution of Gjanica river [4]. It brings a lot of pollution especially for the wells of drinkable waters along the river. Technologies with which are obliged to

function the oil sources of Alb Petrol belong to '50 -'60, while those K.P.TH.N.¹ of Ballsh, TEC of Ballsh and U.P.N.² Fier, are technologies of '60 -'70 and like this they bring problems with environmental pollution not only in their territory but also for the community around them. TEC of Ballsh is used to keep the refinery with proper evaporation, and at the same time is keeping Ballsh town and refinery with technological water being also the main line for the electrical power in the south of Albania. Also the long functioning of processing of heavy oil, with high concentration of oil, mechanical wastes, salts and huge amounts of oil gases caused amortization of technological lines and equipments. As the result the environment pollution level in K.P.TH.N. Ballsh, UPN Fier, but also in all oil well sources is very high. As the result of technology used for oil drilling, pollution sources are found at well source and follow up to processing plant.

This plant is one of four main factors that damage the natural balance. Due to it in atmosphere are released sulphur dioxide, and carbon dioxide. With passing of time pollution level have been increased despite the fact that is invested always for substitution or repairing of apparatus and technological lines. In general the plant is completely amortized being so one of the biggest resources for pollution. Despite the fact that this plant represent one of the most important industrial in national level, where are employed a considerable number of employees, still is the main factor of environmental pollution and cause for the health problems of inhabitants, especially in Ballsh and Fier.

INDUSTRY AND AIR, WATER AND LAND POLLUTION

Water pollution Main hydric elements of Fier region are rivers of Shkumbin, Vjosë, and Seman with its branch Gjanica. These rivers results to be polluted from the industrial-economical activities of human beings.

Gjanica river flow through the Fier city and results to be dead from ecological point of view. Indicator for the high level of pollution of Gjanica river is the evident change of its quality directly after discharging of polluted water from oil sub products with a high concentration of acid and phenols, which for a long time are discharged in nature. Into it are discharged 12.58-1891m³/month, waters which content oil 0.2-6 mg/l [5], its pollution caused damaging of fauna and flora of this river and all community who is living along it.

Such pollution has been even at Adriatic coastline causing a threatening problem for the coastline tourism. The factors which cause this are decanting implants, being in a very amortized conditions and wells of oil production centers in Usojë, (Kash) Ballsh and Visokë, as the result of damaged technological equipments and long period of their use. As the result of pollutions in these centers and especially in Gjanica River the pollution level is very high. Main sources of Gjanica River from the industrial activity are non functioning of Electro-dehydro-hydrolyzation of K.P.TH.N Ballsh and non functioning of Water Cleaning Scheme of K.P.TH.N. Ballsh where are collected the waters which are discharged during the processing activity K.P.TH.N. Ballsh.

In Gjanica river except the superficial waters which flow as the result of decanting process are joined even other uncontrolled waters. These waters from the quantitative point of view has very small values almost inconsiderable, while from the content of pollution

¹ Eng. - Combine Deep Oil Processing in Ballsh (Alb. - K.P.TH.N. - Kombinati i Përpunimit të Thellë të Naftës në Ballsh)

² Eng. - Oil Processing Plant (Alb. – U.P.N. - Uzina e Përpunimit të Naftës)

materials point of view, their impact is very big. This come as result of putting most of industrial sectors along it, such are: center of oil production in Ballsh, oil source of Visoka, sand source of Patos and Kasnica (bitumen sand), which are as the result of old technology, do not fulfill the requirements for environmental protection. The evident amortizing of these equipments has brought the uncontrolled leaking of oil on the land surface. These leaking come from the oil wells, transport tubes, oil collecting groups, which did not have any processing activity.

Pollution level in different periods of year result different. In summer, the pollution level is higher than in winter period, and as bigger the flow of waters the lower is pollution level.

Oil presence in water environment has negative effects, since it can be found in forms of transparent skins on the water surface which reach the parameter thickness 0.000125 mm [8]. This skin being on the water surface is an obstacle for interference of sun beams in water environment and the contact of the oxygen of air with water, bringing a lot of consequences for the water flora and fauna. During the contact of water with oil, water get a characteristic taste and smell decreasing the oxygen concentration on it. Water is an important element for human beings, agriculture and live stock. Irrigation waters cannot content more than 500 mg/l chlorure. [8] Pocom water pollution risk in a distance of 13 km from the refinery industry in Ballsh is actually limited. But the contrary it happen with the wells supplied from the bottom stream of Gjanica river, since the villages, which use these wells, exist the pollution risk. There are done proposals from the water supply enterprise to supply these villages from other resources, but till now have not been found any fund for them.

Air pollution from industry. Air pollution problems identified in our area where is done this research come from the pollution of TEC Fier, which while is burning the raw material release sulphur gas untreated before 3.5-6%, [2] oil industry, urban wastes, and auto flux. Industry which is situated more closer to urban area have a direct impact in air quality of this area. One of the most biggest urban center of the region is Fier city which results with high pollution level as the result of above mentioned factors. Close to it is situated TEC of Fier which in the past have been one of the air polluter. During the last years TEC-i is functioning with minimal capacity producing 10-30 MW/hour and as raw material is used fuel produced from Oil Processing Plant in Fier. The fuel used content 3.5-6% [5] sulphur which during its burning form sulphur gases and later joining with water evaporation form sulphuric acid which has corrosive features. Thermo central of Fier in 1997-1998 released in air 1765 ton fumes, 7100 ton SO₂ and 14200 ton CO₂. [3] Another factor with a great impact in air pollution especially in Ballsh and Fier, is oil industry. From the observations on the site is noticed that as the result of heavy situation of collective reservoirs in oil industry discharge oil gases. This situation is evident even from evaporations that happen during the oil processing at decanting stations in Usoja, Visoka, Zharrëz, Marinëz. Pollution is noticed also in oil fields Patos- Marinëz, where are released in air 6400 m³ gas, equal to 115 ton sulphur per year [4]. Since the oil is kept in open reservoirs from which are evaporating small portions, releasing in air a disgusting smell.

Air pollution has brought negative effects even for human health. The polluting elements in the air interfere into the lungs, in this way they are bringing negative effects for human health. Data taken from Regional Hospital of Fier show an increasing of patients who suffer from severe diseases with severe problems for their health such are: pneumonia, bronchitis, tuberculosis, allergies, but also genetic mutations etc., as the result of high level of pollution from the presence of gases in the air. Also a serious concern is the

increasing of cases of employees in oil drilling and processing industry who suffer from professional diseases. The oil areas have H₂S (sulphur hydrogen) and this gas is concentrated close to the land. [3]

A critical situation is especially in the big cities is also the quantity of polluting elements in the air. This alert situation is showed also through analyses of quality level analyses in Fier city.

Table 1. Results of urban air quality in 2012 [7]

Microgram (μg) / m^3	LNP	PM10	SO ₂	NO ₂	Ozone
Fier	221	97	20	25	74
Albanian norm ('12)	140	60	60	60	65
EU Standard	-	40	20	40	-

According to the table, (which is based on air monitoring for a period of three months in Fier), quality level of air in 2012 result lower, compared with 2003, for terms of PM10 (particles that can be breathed 10 mikron) and Ozone, but anyway is higher compared with level of Albania. The norm of PM10 result higher compared with European Union Meanwhile in Fier SO₂ (Sulphuric dioxyd) has the same level with EU norm.

Land pollutions. In regional level are noticed some problematic areas of polluted lands, certainly a problem strongly related to economic and developing factors of the past. A negative impact on the land structure and flora, decreasing the production of agricultural products and the flora in general, is affected from hydrocarbures. Their existence in high levels is seemed to be decreased the quantity of land feeding elements, especially nitrate. Nitrate in high level in such lands affect the yellowing of leafs and other plants and in immaturity of agricultural products. As the result of high viscosity and high oil density, but also of land structural features, the pollution of lands from oil, resources of Alb Petrol result have not interfered deeply. This pollution has damaged many land areas possessed from the farmers who live close to oil areas, for which they have been reimbursed. According to the data of Alb Petrol company results that in 2010, number of cases when farmer have been reimbursed for damages caused in their agricultural products, lands which are damaged from the activity of oil drilling and transport process in all resources, were round 129 cases, from 246 cases that were in 2009, in a land area 145590 m². [1] This surface is decreased as the result of the checking in time process done from the Environmental Department in Patos, in order to rehabilitate the environment in decanting process Sheqisht, Visoka, and the oil transport station in Zharrëz etc.



Figure 2. The main hotspot of Fier region

A panorama over the most polluted areas in Fier Region is given through the map done for this purpose. These map serve to interpret and analyze polluted areas in one side and from the other side face with each other factors which caused these pollutions. based on what is observed we can say that we have to do with industrial areas that have a high level of pollution (especially with areas where industry have been developed during communism period), and the same for the areas with high level of urbanization. it seems that humanism of the area where the research study is done is the basic factor which has caused the most severe problems with pollution of environment.

SOME RECOMMENDATIONS IN ORDER TO IMPROVE SITUATION

At the end are given some suggestions to improve the environmental situation in the area

which have been part of this research study.

- Improvement of existent environmental situation from polluted waters, collecting them in oil fields and putting in efficiency cleaning implants at decanting and processing plants
- Taking technical administrative measures in order do not allow spreading in the air of oil gases.
- Industrial implants that will be constructed in the future in the area where is done this research will have also other research studies in order to preserve pollution level in optimal parameters.
- Subsequent developments will ask to speak about an eco-economy, where economic development will be harmonized with sustainable environmental development.
- Construction of managing and treating systems for drinkable water , in order to have a sustainable use of resources and reducing of pollution, increasing of efficiency for the use of water resources and protection of water layers.

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