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The goal is to analyze the problems of environmental control and outline alternative solutions of the identified problems.

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Chapter 1

The condition of environment in Ukraine

1.1. Environment in Ukraine is dangerous for life

All the resources necessary for our life are taken from the environment. This is the air we breathe, water which makes up 60% of our body¹ and which makes our life possible, soil, which is used to grow agricultural products, and natural landscapes, which are a perfect place for rest and relaxation.

According to WHO, all the surroundings, conditions or influences affecting a human being are factors that influence his/her health². To such factors belong, inter alia, chemical and biological pollution of air, water and soils, noise, agricultural methods, irrigation schemes, man-made climate change, change of ecosystems³.

It is not only life and health of people that are affected by the environment. Economy of each country is dependent on the balanced use of available natural resources, which are inseparable part of the environment. Taking care of nature is an unavoidable prerequisite for sustaining economic development. Some countries, including Guyana and Costa Rica, are fully dependent on their natural systems as the basis of their wealth and work a lot to protect them. So, sustaining nature is not only about protecting the environment, it is about keeping the economy going⁴.

It is natural that the state should balance human needs for healthy environment and economic growth at the expense of use of natural resources. In the majority of developed countries this balance is sustained by the environmental control bodies. These bodies can have different names – inspections, agencies, services. What matters is the goal they pursue which is conservation and improvement of the environment. It can be achieved by means of:

- observation (monitoring) of the environment,
- control over activity of people, businesses, institutions and organizations that can affect the environment
- analysis of the collected information to put forward proposals concerning improvement of the environment.

Insufficient control results in neglected condition of the environment. Consequently, it has a negative impact on both human health and economy of the state.

1.2. Nowadays health status in Ukraine is estimated as unsatisfactory

¹ <https://water.usgs.gov/edu/propertyyou.html>

² http://www.who.int/quantifying_ehimpacts/publications/preventingdisease.pdf p. 21

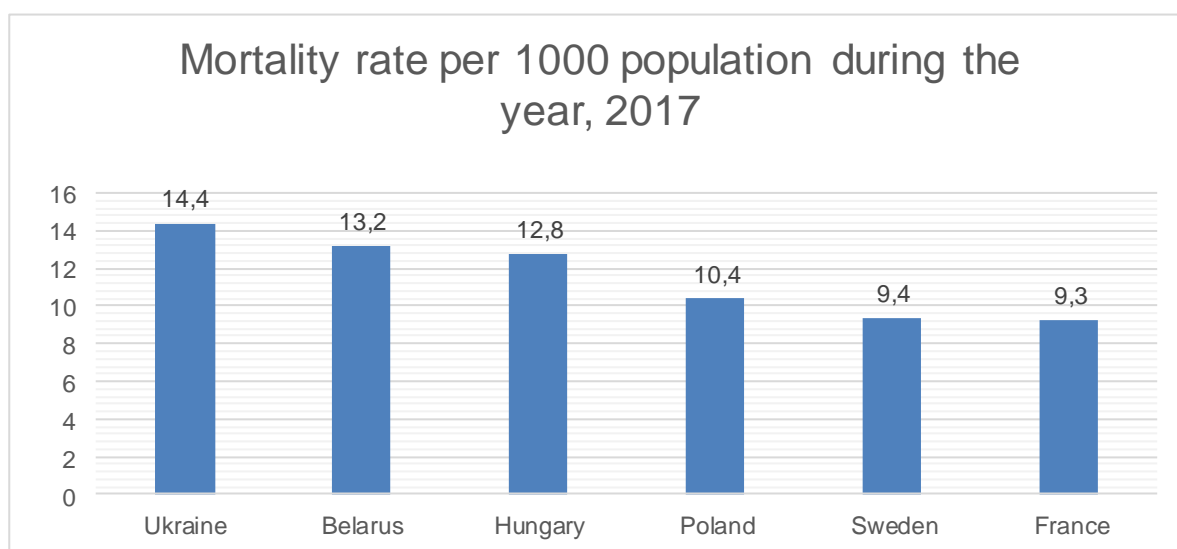
³ http://www.who.int/quantifying_ehimpacts/publications/preventingdisease.pdf p. 23

⁴ <https://www.theguardian.com/environment/blog/2013/jan/09/economy-nature>

Ukraine takes the fifth place regarding mortality rate⁵. Average mortality rate indicator is 14,4 per 1 000 population and is quite high⁶ in comparison with other countries. For instance, in Poland this figure is 10,4, in Belarus – 13,2, Hungary – 12,8, in Sweden – 9, 4, France – 9, 3 (see Figure 1).

Fig. 1. Prepared by the authors based on the The World Factbook, Central Intelligence Agency data⁷

Estimated life expectancy in Ukraine is 71,8 years⁸. On the basis of this life span it is expected that 64,1 years Ukrainians will live in health⁹. In the neighboring and developed countries life expectancy is significantly longer. In Poland estimated life expectancy is 77,6 years, Belarus – 72,7, Hungary – 75,9, Sweden – 82,1, France- 81,8 years. Similarly longer is healthy life expectancy (see Fig. 2)



⁵<https://www.cia.gov/library/publications/the-world-factbook/rankorder/2066rank.html>

⁶<https://www.cia.gov/library/publications/the-world-factbook/rankorder/2066rank.html>

⁷<https://www.cia.gov/library/publications/the-world-factbook/rankorder/2066rank.html>

⁸<https://www.cia.gov/library/publications/resources/the-world-factbook/rankorder/2102rank.html>

⁹http://gamapserver.who.int/gho/interactive_charts/mbd/hale_1/atlas.html

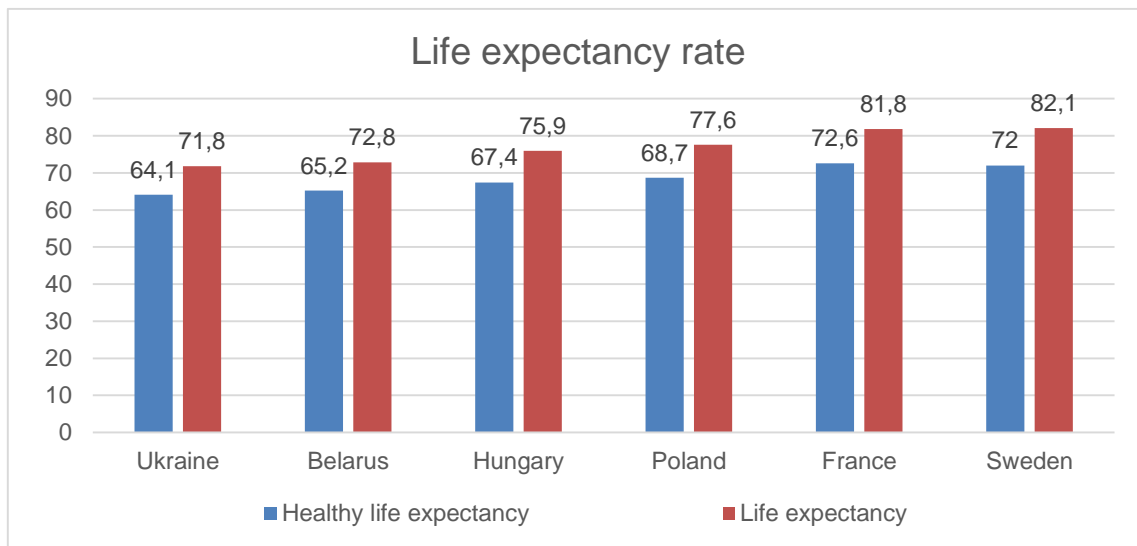


Fig. 2. Prepared by the authors on the basis of *The World Factbook*, *Central Intelligence Agency data*¹⁰

Life expectancy directly depends on human health. One of the elements that affects the health of Ukrainians is the condition of the environment¹¹. What factors lead to such condition of health and life of Ukrainians?

1.3. The air: what is in the lungs of Ukrainians?

Air quality is an important environmental component, a necessary condition for life on Earth. Air pollution represents the biggest environmental risk to health. In 2012, one out of every nine deaths was the result of air pollution-related conditions. Of those deaths, around 3 million are attributable solely to ambient (outdoor) air pollution (business activity, energy, transport, etc.). Air pollution affects all regions, socioeconomic groups and age groups¹².

Negative changes in the air happen due to coal combustion, waste burning (including burning landfill waste), pesticide spraying, large cattle farms, metal and by-product coke plants and cement plants, located all over Ukraine, vehicle emissions, etc. Mostly air pollution comes from fuel combustion, both from transport vehicles and stationary sources (power plants, industry, households or biomass burning, etc.)¹³.

Air in Ukraine is extremely polluted. According to the World Health Organization, as of 2012 Ukraine occupies the sixth place as to the general number of deaths (54 507 deaths) and the first place in the world as to the number of deaths per 100 thousand people (120 deaths) caused by air pollution¹⁴ (see Fig. 3).

¹⁰ http://gamapserver.who.int/gho/interactive_charts/mbd/hale_1/atlas.html

¹¹ <http://www.who.int/hia/evidence/doh/en/>

¹² <http://apps.who.int/iris/bitstream/10665/250141/1/9789241511353-eng.pdf?ua=1> 15 p.

¹³ http://www.who.int/gho/phe/outdoor_air_pollution/en/

¹⁴ <https://www.theguardian.com/environment/2016/sep/27/more-than-million-died-due-air-pollution-china-one-year>

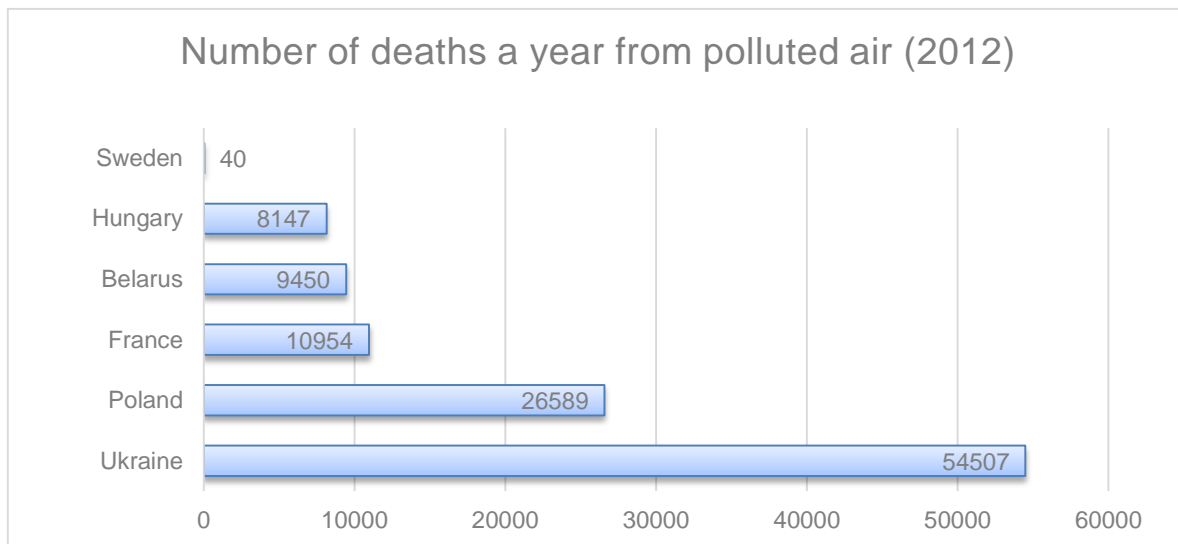
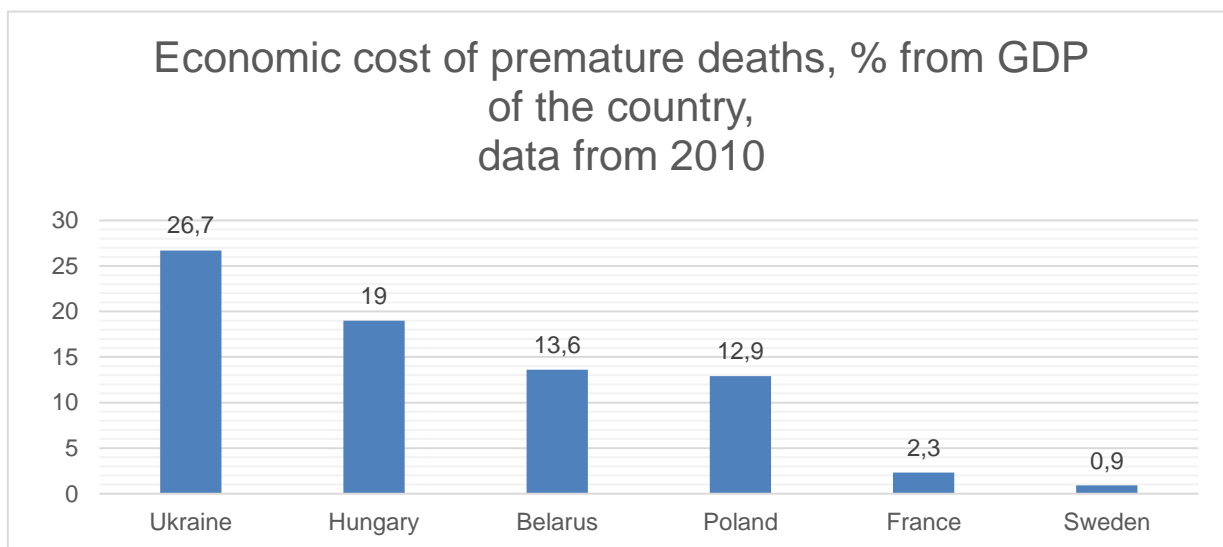


Fig. 3. Prepared by the authors on the basis of the data from *The Guardian* and *World Health Organization*¹⁵.

Economic estimation of the total cost of premature deaths¹⁶ from diseases related to air pollution in Ukraine is 94 201 million dollars¹⁷ (according to the data from 2010). Comparison of this figure with the GDP of Ukraine shows that social cost of premature deaths will be 26.7%¹⁸. This figure is very high if compared with that of other countries. So, for 2010 in Poland this percentage was 12, 9 % of GDP, Belarus – 13, 6 % of GDP, Hungary – 19 % of GDP, France – 2,3 % of GDP, Sweden – 0, 9 % of GDP. In fact, premature deaths caused by unhealthy environment affect the economy of the country (see Fig. 4).



¹⁵ <https://www.theguardian.com/environment/2016/sep/27/more-than-million-died-due-air-pollution-china-one-year>

¹⁶ Evaluation of premature deaths economic cost for society is based on the evaluation of average life cost. The detailed methodology is provided in the original research: WHO Regional Office for Europe, OECD (2015). Economic cost of the health impact of air pollution in Europe: Clean air, health and wealth. Copenhagen: WHO Regional Office for Europe, http://www.euro.who.int/_data/assets/pdf_file/0004/276772/Economic-cost-health-impact-air-pollution-en.pdf

¹⁷ http://www.euro.who.int/_data/assets/pdf_file/0004/276772/Economic-cost-health-impact-air-pollution-en.pdf , 25 p.

¹⁸ http://www.euro.who.int/_data/assets/pdf_file/0004/276772/Economic-cost-health-impact-air-pollution-en.pdf , 28 p.

Fig. 4. Prepared by the authors on the basis of data of the World Health Organization Regional Office for Europe¹⁹

As reported by the World Health Organization, air pollution causes respiratory diseases, cancer, cardio-vascular diseases that further results in lethal cases (see Fig. 5)²⁰. Thus, in 2012 the number of deaths caused by these diseases amounted to 28 673. Cardio-vascular system is most negatively affected by air pollution.

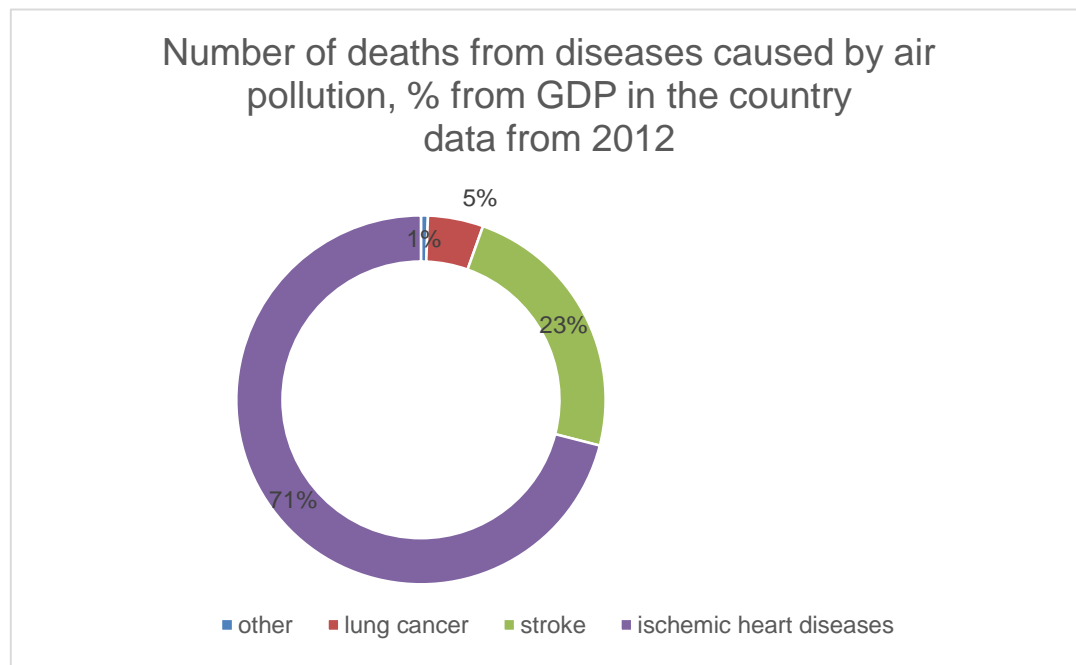


Fig. 5.

Prepared by the authors on the basis of data of World Health Organization²¹.

For instance, on 14-20 February 2017 Kyiv recorded air pollution with harmful substances. Nitrogen dioxide thresholds were exceeded 2,0-3,9 times; formaldehyde - 1,3-2,1 times²². During the second week of January 2017 Zaporizhya Regional Hydrometeorological Centre recorded high level of air pollution with phenol, nitrogen dioxide and dust²³.

The majority of hazardous²⁴ substances in the air do not have any smell or colour, however, their presence in the air endangers human health, namely:

- nitrogen oxide can cause extreme fatigue, breath instability and death as a result of pulmonary edema;
- phenol leads to drastic changes in the hematopoietic, cartilage and bone cells, and with skin exposure can cause burns;
- hydrogen sulfide can result in death from respiratory arrest or cardioplegia.

In addition, dangerous for environment and human health are hydrogen nitride, methane, formaldehyde that cause respiratory diseases and cardiovascular disorders. Dust (fine solid particles in the air) consists of other pollutants, it can cause allergy and lung edema.

¹⁹ http://www.euro.who.int/__data/assets/pdf_file/0004/276772/Economic-cost-health-impact-air-pollution-en.pdf , 28 p.

²⁰ <http://apps.who.int/iris/bitstream/10665/250141/1/9789241511353-eng.pdf?ua=1> 71 p.

²¹ <http://apps.who.int/iris/bitstream/10665/250141/1/9789241511353-eng.pdf?ua=1> 71 p.

²² <http://www.umoloda.kyiv.ua/number/0/2006/108996/>

²³ <http://zp.depo.ua/ukr/zp/u-zaporizhzhzhi-zasikli-visoke-zabrudnennya-povitrya-fenolom-17012017095400>

²⁴ http://p-for.com/book_496_glava_22_2.13._Zabrudnennja_atmosfernog.html

Fuel combustion from transport vehicles is one of the significant sources of air pollution²⁵. According to the Ministry of Infrastructure of Ukraine, nowadays Ukraine numbers more than 9,2 mln transport vehicles, including 6,9 mln motor cars²⁶. 2016 saw increase in the number of cars per 1000 capita, which for the first time has exceeded the threshold of 200 cars²⁷. Moreover, in comparison with the data of the first quarter of 2015, the first quarter of 2016 saw increase in car import by 57 %²⁸. Increase in the number of cars results in higher pollution of air with car exhaust fumes that contain carbon monoxide, carcinogenic agents, such as benzopyrenes and other harmful substances.

Cases of air pollution can be traced almost in any settlement of the country.

Case study 1. Air pollution from pig and poultry farms that happens all over Ukraine

According to the research of the International Charitable Organization «Environment-People-Law» (EPL), the environment in Ternopil²⁹, Poltava³⁰, Ivano-Frankivsk³¹ regions in 2015-2017 is polluted by pig and poultry farms.

Pig farms and poultry farms are places where large numbers of pigs, poultry and feed are managed and, accordingly, places where large amount of organic waste is produced and stored. This organic waste can be a source of harmful pollutants of the environment which adversely affect health, well-being and life of people.

Manure from pig farms has the highest risk for people and the environment as it is the source of methane outburst. One pig produces from 6 to 17 kg of manure per day. One ton of manure produces 52 m³ of biogas, containing 60% of methane, which belongs to ozone-destructing substances and causes global warming³². Methane is harmful for human health; it causes pulmonary edema, breathlessness, accelerated heart rate and headache.

Moreover, manure from animal farms can contain residues of antibiotics and premixes (hormones), 75% of which can be excreted unchanged with urine and fecalia, and nitrates and eggs of worms, which through soil, air and water can be transferred to humans. Some of these hormones ruin endocrinal system and can affect reproductive system of animals and humans.

Presence of nitrates in manure is likely to pollute soil, surface waters and agricultural products grown at this fertilized soil. Pollution of groundwater with nitrates from manure can become a serious danger for the health of the population. Consumption of such water can lead to:

- miscarriage risk in pregnant women;
- methemoglobinemia or the so called «blue baby syndrome», a form of child poisoning when oxygen-carrying function of erythrocytes is significantly reduced, which causes skin cyanosis. In extremely severe cases it can be lethal.

Manure also may contain bacteria causing meningitis or leading to brucellosis. Farming

²⁵ http://www.who.int/gho/phe/outdoor_air_pollution/en/

²⁶ <http://mtu.gov.ua/content/statistichni-dani-po-galuzi-avtomobilnogo-transportu.html>

²⁷ https://gazeta.ua/articles/avto/_v-ukrayini-zroslo-kilkist-avtomobiliv-na-tisyachu-osib/680260

²⁸ <https://www.epravda.com.ua/news/2016/07/15/599255/>

²⁹ <https://provse.te.ua/2016/05/nezakonnyi-svynarnyk-u-smykivtsyah-zabrudnyuvav-richku-hnizdechnu/>

³⁰ <http://bastion.tv/news/svinokompleks-silski-tradiciji-zasmerdiv-biliki-meshkanci/>

³¹ <http://epl.org.ua/law-posts/minimizatsiia-vplyvu-na-dovkillia-ta-zdorov-ia-zhyteliv-vid-funktsionuvannia-svynarnykyv-tzov-danoshu/>

³² <http://epl.org.ua/announces/a-svynari-proty-abo-chomu-asotsiatsiia-svynariv-ukrainy-proty-prozorykh-ievropeiskykh-pravyl-vedennia-biznesu/>

waste can also contain viruses, including hepatitis E.³³

The very premises of pig farms produce emissions of ammonia, hydrogen sulfide, methane, propion aldehyde, caproic acid, methyl mercaptan, as well as fur dust and microorganisms. These substances cause respiratory diseases, diseases of kidney, liver, can lead to poisoning.

According to recent data, in Ukraine there are about 3800 pig farms most of which pollute the environment and bear risks for human health³⁴.

For instance, EPL research shows that in 2017 in Bilyky village of Poltava region, where a pig farm is located, nitrate and ammonia thresholds were exceeded dozens of times. These substances were carried into surface and groundwater consumed by local population.

Case study 2. Air pollution from Trypillia TPP

The most powerful power plant in Kyiv region – Trypilska TPP – is located in the town Ukrainka of Kyiv region³⁵.

The emissions from the Trypillia power plant elevate the levels of toxic particles, SO₂ and NO₂ in the air over entire central Ukraine, with some of the worst impacts felt in Kyiv due to prevalent wind patterns. Exposure to these pollutants increases the risk of diseases such as stroke, lung cancer, heart and respiratory diseases in adults, as well as respiratory symptoms in children. This leads to premature deaths from these causes³⁶.

Trypillia power plant produces emissions of solid particles PV_{2.5}, which cause the aforementioned diseases. The average PV_{2.5} levels in the air in Kyiv amounts to 20 µg/m³. Though due to the emissions from the Trypillia coal-fired power plant they can show daily increase up to 70% as compared to the average indicator.

Apart from cardiac and respiratory diseases and cancer with lethal cases, emissions from Trypillia TPP annually cause 440 cases of babies born with a low birth weight, 80 cases of chronic bronchitis, 15 000 asthma attacks in adults and 1800 in children³⁷.

Ukrainian legislation regulates levels of air emissions, installation of filters on emissions sources and responsibility for violations of these provisions. At the same time, air pollution in Ukraine illustrates the insufficient control over the quality of air. In addition, there are no data on air condition and the sources of air pollution. Consequently, Ukrainians do not know what air they breathe, what is the amount and kinds of pollutants present in the air from different pollution sources.

Air monitoring in Ukraine is performed by the State Meteorological Service. However, observations are made only in 39 out of 460 cities of Ukraine³⁸, i.e. air condition is monitored less than in 10 % of Ukrainian cities. In 2016 the powers of sanitary supervision over air condition control were transferred from the Sanitary and Epidemiological Service of Ukraine (SES) to the State Service of Ukraine on Food Safety and Consumer Protection (Derzhprodsposhyvsluzhba of Ukraine). However, after restructuring SES laboratories are subordinated to the Ministry of Health Care of Ukraine (MHC) but they do not have

³³ <http://www.who.int/mediacentre/factsheets/fs280/en/>

³⁴ https://www.google.com/maps/d/viewer?mid=1sBqGO5820GOz7n3pnwfcTENsgFQ&%3Bhl=en_US&%3Bll=51.888498641382&ll=48.87750985373208%2C31.127083500000026&z=6

³⁵ <http://www.centrenergoc.com/divisions/trip/>

³⁶ <http://www.greenpeace.org/eastasia/Global/eastasia/publications/campaigns/Climate%20and%20Energy/Trypillia%20case%20study.pdf>

³⁷ <http://www.greenpeace.org/eastasia/Global/eastasia/publications/campaigns/Climate%20and%20Energy/Trypillia%20case%20study.pdf>, 10 p.

³⁸ http://www.cgo.kyiv.ua/index.php?fn=u_zabrud&f=ukraine&p=1

controlling powers. At the same time the State Service on Food Safety and Consumer Protection has controlling powers but does not have its own laboratories.

In addition, one can argue that emissions data do not objectively illustrate the true state of things with air condition. It is related to the fact that monitoring of air condition is done in approximately 10 % cities of Ukraine. There are no laboratories and other technical means which are necessary to record air condition. Official data are also established on the basis of emission data, which are directly provided to the State Statistical Service of Ukraine by the enterprises. However, nobody checks whether the data submitted are reliable.

The inconsistency of the results with the actual air condition is also conditioned by the peculiarities of the way scheduled inspections of enterprises are organized. For example, the State Environmental Inspection of Ukraine should notify the company within 10 days prior to the scheduled inspection. As a rule, after such notification the enterprises either start repairs or reduce production. Therefore, the inspections may not reflect the actual volume of emissions to the atmosphere. Accordingly, generalized data of such inspections also do not show the actual condition of the air.

As a consequence, Ukrainian people continue inhaling polluted air and accumulate in their lungs harmful substances, which, being transferred with oxygen in the blood, penetrate into each part of the body and cause chronic and lethal diseases.

1.4. Contaminated soil: junk food, polluted water, morbidity and premature mortality

Soil is one of the environmental components. Soil quality reflects the general condition of the environment. Substances present in the soil can be transferred both to the surface and groundwater, as well as evaporate in the air. In a similar way, hazardous substances present in the air or water can accumulate in soils and through food products and drinking water penetrate into the human body.

WHO researches have shown that chemical and biological soil contamination is one of the factors affecting human health³⁹.

The most frequent contaminants of soil in Europe are heavy metals and mineral oil. Approximately three million sites in Europe are estimated to have been contaminated with heavy metals⁴⁰. Mining, industry, smelting, agriculture and burning fossil fuels, disposal of municipal waste, paint and electronic waste contribute to the burden of heavy metals in soils⁴¹. Heavy metals enter human body in food products grown on contaminated soils, as well as water resources that come into contact with contaminated sites. Accumulation of heavy metals in a human body leads to severe diseases described in Table 1.

Hazardous chemical substances in European soils⁴², Table 1

Heavy metal in soils	Pollution sources	The way of getting into human organisms	Consequences for health
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³⁹ http://www.who.int/quantifying_ehimpacts/publications/preventingdisease.pdf 23 p.

⁴⁰ http://ec.europa.eu/environment/integration/research/newsalert/pdf/IR5_en.pdf 4 p.

⁴¹ http://ec.europa.eu/environment/integration/research/newsalert/pdf/IR5_en.pdf 9 p.

⁴² http://ec.europa.eu/environment/integration/research/newsalert/pdf/IR5_en.pdf 10 p

Arsenic	Pesticides; gold, lead, copper, nickel, iron mining, steel processing; coal burning; wood processing.	Consumption of contaminated groundwater, food prepared with this water, or food crops irrigated with water high in arsenic	Gastrointestinal tract, liver, cardiovascular, neurological diseases, cancer, increased risk of miscarriage, stillbirth and pre-term birth.
Asbestos	Mining of asbestos for construction and asbestos product manufacture	Exposure occurs through food and water; it can also lodge in the skin.	Asbestos fibres become lodged in lung tissue which causes lung cancer and other pulmonary diseases.
Cadmium	Zinc smelting, mine tailings, burning coal or waste containing cadmium, nickel-cadmium batteries, accumulators, TVs, solar cells.	Accumulation in plants, cultures growing in cadmium-contaminated soils or irrigated with cadmium-contaminated water. Accumulation in animal meat.	Liver and kidney damage, development of itai-itai disease ⁴³
Dioxin	Waste incineration, reprocessing metal industry, paper and pulp industry,	Consumption of contaminated food	Dioxins are highly toxic and can cause reproductive and developmental problems, damage the immune system, interfere with hormones and also cause cancer.
Fluoride	Coal mining	Consumption of contaminated water	Skeletal fluorosis, pain in the joints
Lead	Batteries, ammunition, paint, hair dyes, fishing equipment, vehicle exhausts, mining industry, water pipes.	Consumption of contaminated food, water	Neurological damage. Reduces IQ and attention. Impairment of hand-eye co-ordination. Encephalopathy. Bone deterioration. Hypertension. Liver disease.
Hazardous pesticides	Herbicides derived from trinitrotoluene with impure dioxin. Synthetic insecticides, such as DDT (crop dust), which, despite being banned, are still used.	Accumulation of pesticides in food products. Being accumulated in soils pesticides enter groundwater.	Organic chemicals, including pesticides, have been linked to a wide range of health problems. Conclusive proof of cause and effect in humans is challenging due to consumption of a wide range of pesticide at low level.

⁴³ Chronic intoxication with cadmium salts caused not only the intolerable pain in the joints and spine, but also osteomalacia and renal failure that resulted in the death of patients. <https://uk.wikipedia.org/wiki/%D0%86%D1%82%D0%B0%D0%B9-%D1%96%D1%82%D0%B0%D0%B9>

Mercury	Electrical switches, fluorescent light bulbs, batteries, thermometers, dental fillings, coal mining, pesticides, medical waste, burning coal and fuel oil, chlor-alkali industry	Consumption of contaminated food	Central nervous system damage. Affects brain development, resulting in a lower IQ. Affects coordination, eyesight and sense of touch. Liver, heart and kidney damage
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The table is prepared by the authors on the basis of the European Commission data⁴⁴

It should be noted that Ukraine does not have comprehensive information on the condition of its soils. At the same time almost all the industries leading to heavy metals accumulation in soils are present in the country (Table 1).

Case study 1. Soil contamination from landfills

In 2016 Ukraine produced about 11 million tons of waste, which are buried at 5,5 thousand landfills with the total area of more than 9 thousand hectares. Most landfills do not comply with environmental standards, and as a result waste infiltrates get into soil. Operation of spontaneous landfills causes air and water pollution.

Thus, soil samples research has shown that Hrybovychi landfill badly affects soils in the area of direct landfill impact. Since June 2017, the amount of chlorides, cadmium, manganese and lead in the soil has increased⁴⁵.

Unauthorized landfills are located in every rayon of Ukraine⁴⁶; consequently, soils in such areas are exposed to contamination.

Case study 2. Soil contamination with hazardous toxic waste banned to be used in Europe

Hexachlorobenzene (HCB) was buried in the landfill in Kalush of Ivano-Frankivsk region in the period of 1973-2000. HCB is poisonous substance that affects almost all the organs in the human body, primarily liver, cardiovascular and CNS systems, and can cause cancer.

The landfill is located at 1km distance to the nearest village and 12 meter distance to Sapohiv river (the Dniester basin). In 2013-2014, the state funded clean-up of the landfill from waste and its remediation.

At the end of March 2015, after the “clean-up” works had been completed, EPL took samples from the landfill. Examination of the samples has shown that concentration of hexachlorobenzene exceeded the norm by half a million times⁴⁷.

Soil contamination and the environment in general has a partial impact on the sad statistics in Kalush rayon: according to the results of research at the Ivano-Frankivsk National Medical University, the level of cancer in Kalush rayon is higher than the average indicators of Ivano-

⁴⁴ http://ec.europa.eu/environment/integration/research/newsalert/pdf/IR5_en.pdf 10 p

⁴⁵ http://dei.lviv.ua/index.php?option=com_content&task=view&id=1512&Itemid=145

⁴⁶ <https://ecomapa.gov.ua/>

⁴⁷ <http://epl.org.ua/announces/epl-pro-doslidzhennia-kaluskoi-problemy-z-vyvezennia-heksakhlorbenzolu-abo-iak-za-derzhavni-hroshi-ochyshchaiut-terytoriiu-ukrainy/>

Frankivsk oblast⁴⁸. For cancer Kalush rayon 1.5 times exceeds oblast indicators. At present, there are 1524 cancer patients registered in the city clinic. Only for the period of less than nine months of this year 121 cancer patients were registered, the diagnosis of which was confirmed by the experts from the regional oncology clinic. In 25 patients (from 121) the disease was diagnosed already in the 4th stage, which is 20.7% of all the patients registered this year. Also 27 cases of visual forms of cancer were identified⁴⁹.

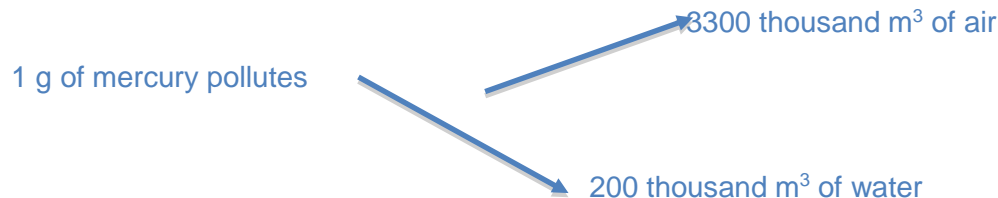
After findings of exceeding indicators, the authorities did not take any action to clean the landfill. At the same time, in the third quarter of 2016 Ivan-Frankivsk laboratory centre of the Ministry of Health Care of Ukraine did not detect exceeded concentration of hexachlorobenzene in the area of landfill impact⁵⁰. The population of Kalush district is still exposed to the hazardous impact of hexachlorobenzene waste.

Case study 3. Contamination of soils with mercury

In Ukraine there are frequent cases of soil contamination with mercury. Thus, landfills of waste fluorescent lamps, containing mercury, were found near the town of Chyhyryn in Cherkasy region⁵¹, in the territory of Dykanka rayon in Poltava oblast⁵², in the city of Kyiv in Kolektorna Street⁵³. At the end of 2016 in the village Zmitniv of Sosnytsia rayon in Chernihiv oblast about 35 thousand fluorescent lamps were dumped on the side of the road, which led to soil contamination⁵⁴.

When fluorescent lamps are damaged, mercury vapour gets into the air and later in soil and water resources.

Every compact fluorescent lamp contains up to 4 mg of mercury. Mercury is an extremely hazardous substance that is accumulating in the human body and cannot be cleared from the body.



Moreover, when mercury enters aquatic ecosystems, water microorganisms transform it into methylmercury – mercury compounds, which in small doses have much more hazardous effect than elementary mercury.

Also mercury can contaminate soils from enterprises that use it for production process. In particular, soils near «Radical» plant in Kyiv are contaminated with mercury (69 mg/kg with the norm being 2,1 mg/kg), concentration of which hundreds of times exceeds baseline values and dozens of times exceeds current threshold limits. Also, this area shows

⁴⁸<http://www.galychyna.if.ua/publication/society/nezdorove-dovkillja-nezdorovi-ljudi/>

⁴⁹<http://kalushfm.com.ua/index.php/publikatsii/statti/item/4929-tsoho-roku-u-kalushi-na-oblik-onkoloha-vziato-bilshe-sotni-zhyteliv-po-oblasti-ikh-chyslo-shchoroku-zrostaie-maizhe-na-4-tysiachi-kalushpro>

⁵⁰<http://www.ses.if.ua/ua/monitoryng/post407>

⁵¹<http://poltava.depo.ua/ukr/cherkasy/u-cherkasah-znaydeno-zvalishche-lyuminescentnih-lamp-22112016094400>

⁵²<http://region.unn.ua/uk/news/81565-vartist-utilizatsiyi-rtutnikh-lamp-zi-lvova-koshtuvatime-blizko-150-tis-grn>

⁵³<http://ntn.ua/uk/video/news/2016/03/11/20410>

⁵⁴<http://pik.cn.ua/23963/bilya-sela-zmitniv-znaydeno-zvalishche-vidpratsbovanih-lyuminescentnih-lamp/>

significant excessive concentrations of lead (145 mg/kg with the norm being 32 mg/kg) and cadmium (0,58 mg/kg). The soils alongside highways and near bus stations are polluted with lead (88 mg/kg) and zink (350 mg/kg), CHP soils are characterized by significant increase in the concentration of zink (350 mg/kg) and copper (110 mg/kg).⁵⁵

However, the population of Ukraine is not aware of the components of the soils, as under research is only insignificant amount of soils. The state enterprise «Institute of Soil Protection» states that contamination of Ukrainian soils does not exceed the threshold values, though this monitoring is conducted in specific sites in all the regions. There can be from 10 to 61 sites per one region⁵⁶⁵⁷. Thus, there is no general picture about the condition of all soils.

The State Environmental Inspection exercises control over soil condition in the area of influence of industrial enterprises. At the same time after the results of the control SEI in its website informs only about soil pollution, but does not notify the population on the danger of using such contaminated soils⁵⁸.

The population of Ukraine does not know what soils agricultural products grow on and cattle feeds on, which soils water resources go through and what goes into the air as a result of soil evaporation.

1.5. Is water dead, contaminated? No drinking! No swimming!

Water is essential for life. The amount of fresh water on earth is limited, and its quality is under constant pressure. Preserving the quality of fresh water is important for the drinking-water supply and food production. Water quality can be compromised by the presence of infectious agents, toxic chemicals, and radiological hazards⁵⁹.

Each of us uses water every day – for washing oneself, cooking, drinking, cleaning, washing, watering flowers and vegetable gardens, swimming in the pool or open pond, fishing, hydro energy, using mineral sources for therapeutic purposes. Water is used both for the cattle and for industrial processes.

As of 2015, on average, 25 percent of the samples of drinking water taken from piped water supply systems and private wells in Ukraine do not meet the European Union quality standards⁶⁰.

Drinking water quality is an important environmental health problem in the country, both in urban and rural areas. In towns, the main drinking water problems are low water quality and limited water supply. In rural areas, where wells provide a more substantial source of water, the problems include water shortages and contamination of drinking water sources with

⁵⁵http://econf.at.ua/publ/konferencija_2015_03_19_20/sekcija_1_ekologija_i_prirodokoristuvannja/ekoanalitichni_doslidzhennja_form_znakhodzhennja_vakzikh_metaliv_u_runtakh_kijivskogo_megapolisu/16-1-0-236

⁵⁶ <http://www.iogu.gov.ua/monitorynh-obektiv-dovkillya/vazhki-metaly/>

⁵⁷ <http://www.iogu.gov.ua/monitorynh-obektiv-dovkillya/monitorynhovi-dilyanky/>

⁵⁸ <http://www.dei.gov.ua/menyu-3/2011-12-19-07-30-27/zv2016/dijalnist-zvity-4kv.html>

⁵⁹ <http://www.who.int/topics/water/en/>

⁶⁰ http://www.fao.org/nr/water/aquastat/countries_regions/UKR/

chemicals such as manganese, iron, hydrogen sulfide and nitrates. There is also extensive leakage into the underground waters of chemicals and pesticides⁶¹.

Inadequate management of urban, industrial, and agricultural wastewater means that the drinking water of hundreds of millions of people is dangerously contaminated or chemically polluted. It is estimated that about 842 000 people die each year from diarrhoea as a result of unsafe drinking-water, poor sanitation and hand hygiene⁶². In the European region the same reasons cause 14 deaths every day⁶³.

The poor drinking water quality causes such diseases as cholera, hepatitis A, oncological conditions, metabolic disorder, endocrine dysfunction, allergies and skin diseases⁶⁴.

Case study 1. Water contamination in the regions of Ukraine

According to Kyivvodokanal (Kyiv Water Supply Company), which is in charge of evaluating water condition in the capital, the values correspond to the norms (data for November 2016). Similar data are shown by the company for the previous months⁶⁵. The same situation is in other regions of Ukraine. Still, these data do not always meet the reality.

At the same time, according to the results of private laboratories in Kyiv region, 23 % out of 3328 water samples taken from Kyiv water supply system and neighboring settlements contained dirty water and 20 % – moderately contaminated water⁶⁶.

In addition, Chief public health officer of Kyiv informed that in Troyeshchyna village sanitary and microbiological indicators of tap drinking water exceeded the norms⁶⁷.

Unsatisfactory water indicators were also observed in Kyiv water supply system. Iron concentration was exceeded. In water it can cause skin irritation, affect liver and cause heart myocardial infarction⁶⁸.

Water from industrial and private wells, used by population, is also contaminated.

During the first quarter of 2017 laboratory centre of the MHC in the Carpathian region conducted monitoring of 577 individual wells, 10,8 % of water from which do not comply with sanitary and hygienic norms. Nitrates were found in 62 samples. 39 samples were examined for bacteriological indicators, out of them 15 samples did not meet sanitary and hygienic norms, which made up 38,5%⁶⁹.

For the period of 7 months in 2016 the sanitation and hygiene laboratories in Zhytomyr oblast examined 2797 samples of drinking water from decentralized water supply sources, and 935 (33 %) samples were found as such that did not meet the requirements of current legislation as to the nitrates concentration⁷⁰.

The country has 3039 rivers more than 10 km long. If one counts all the streams, the number will be 10 times higher. Also, there are 6904 lakes with the size from 1 and more km². Their total area is 61,72 km², amount of water is 9,69 billion m³. Till 2015 sanitary and

⁶¹ http://www.fao.org/nr/water/aquastat/countries_regions/UKR/

⁶² <http://www.who.int/mediacentre/factsheets/fs391/en/>

⁶³ <http://www.euro.who.int/en/health-topics/environment-and-health/water-and-sanitation/data-and-statistics>

⁶⁴ http://www.fao.org/nr/water/aquastat/countries_regions/UKR/

⁶⁵ <http://vodokanal.kyiv.ua/ua/page-kontrol-yakosti-vody>

⁶⁶ <https://voda.org.ua/region?10>

⁶⁷ <http://perspektyvy.kyiv.ua/news/na-troschin-z-pd-kranu-teche-otrujna-voda/>

⁶⁸ http://24tv.ua/chi_bezpechna_voda_u_kiyivskih_kranah_n701712

⁶⁹ <http://www.ses.if.ua/ua/novynu/post512>

⁷⁰ <http://zt-oblses.gov.ua/?p=1281>

epidemiological service examined about 2200 well ranges⁷¹. After reorganization of the SES, new data are absent. Only 10% of all water bodies are examined regarding water condition⁷².

Water monitoring in Ukraine is insufficient and does not reflect objective situation regarding pollution. State Hydrometeorological Service conducts monitoring on hydrochemical composition of water at 151 water bodies and hydrobiological observations are conducted at 45 water bodies⁷³. 8 water bodies are subject to observations related to chronic toxicity of water, at these bodies surface water radioactive pollution indicators are determined. However, less than 1 % of water bodies undergo such studies.

Moreover, Ukraine does not have any measures on preventing pollution of water bodies. For instance, in July 2016 pollution of the Oster river (Chernihiv oblast) resulted in mass death of fish⁷⁴. In April 2016, there was mass death of fish in the river Sluch (Baranivka in Zhytomyr oblast) due to dumping of hazardous substances⁷⁵. At the beginning of October 2016, there was another case of pollution of the river Sluch⁷⁶. Similar events are traced in 2017. There is systematic pollution of rivers and other water bodies.

Control and monitoring in their current format do not always state the cause of pollution and do not prevent deterioration of water quality. Every day Ukrainians consume drinking water coming from different sources of water supply, which often contains hazardous substances.

Water, soils and air in Ukraine are extremely polluted. The reason behind it is that practically there is no monitoring of their condition and control over impact on them. Poor condition of the environment is one of the reasons for life expectancy in Ukraine to be one of the shortest in Europe. This situation can be improved. Ukraine is not the only country facing such a situation. Experience of other countries shows that it is possible to remedy the situation when care of the environment is taken on a regular basis and not from time to time.

Chapter 2

The Institute of control over the state of environment in Ukraine

The current legislation of Ukraine regulates use of natural resources, air emissions, discharges into water resources, their volumes, etc. In order to ensure fulfillment and compliance with these norms, Ukraine has introduced an institute of environmental control, which provides for corresponding responsibility on the part of those who violate these norms.

However, according to the data provided in the previous chapter, atmospheric air, water resources and soils are contaminated, resulting in the population morbidity, often with lethal cases. Illegal use of natural resources, sales of large volumes of illegally mined minerals,

⁷¹ Ibid.

⁷²<http://www.uiph.Kyiv.ua/download/Vidavnictvo/Shchorichna%20dopovid/%D0%A9%D0%BE%D1%80%D1%96%D1%87%D0%BD%D0%B0%20%D0%B4%D0%BE%D0%BF%D0%BE%D0%B2%D1%96%D0%B4%D1%8C.2015.pdf>

⁷³http://www.cgo.Kyiv.ua/index.php?fn=u_zabrud&f=ukraine&p=1

⁷⁴<https://life.pravda.com.ua/society/2016/07/14/215189/>

⁷⁵http://ipress.ua/video/na_zhytomyrshchyni_cherez_ekologichne_lyho_ogolosheno_nadzvychnu_sytuatsiyu_162297.html

⁷⁶<http://zhitomir-online.com/podiyi/54646-u-baranivci-zafiksuvaly-masovu-zagybel-ryby.html>

which also occur, leads to the destruction of natural landscapes, ecosystems, as well as to financial losses of the state. But with the absence of proper monitoring, it is difficult to accurately estimate the amount of losses and damage caused to the environment.

What is the current state of environmental control, how can it be characterized and what factors stood behind its formation?

2.1. Evolution of changes in environmental control

Currently control over compliance with environmental legislation is exercised by:

- the State Environmental Inspection of Ukraine – over compliance with the legislation requirements in the field of environmental protection⁷⁷;
- the State Service of Ukraine on Food Safety and Consumer Protection – over compliance with the hygiene, health and animal well-being legislation, legislation on safe and qualitative food products indicators, compliance with phytosanitary measures, detecting factors of human environment that have detrimental effect on human health⁷⁸;
- the State Service of Geology and Mineral Resources of Ukraine – over geological study of the mineral resources and their rational and efficient use⁷⁹;
- the State Agency of Forest Resources of Ukraine – over compliance with the regulations on forest resources management⁸⁰;
- the State Service of Ukraine for Geodesy, Cartography and Cadastre – over compliance with land legislation, use and protection of lands of all categories and types of property, fertility of soils⁸¹;
- the State Agency of Fisheries of Ukraine – over use and renewal of water bio resources in exclusive (sea) economic zone of Ukraine, territorial sea, internal water bodies of Ukraine and water resources beyond Ukrainian jurisdiction⁸²;
- the State Agency of Water Resources of Ukraine – control over compliance with the operation regime of water storage reservoir, water economy systems and channels⁸³;
- the State Service of Ukraine for Transport Safety – over compliance with requirements to prevent environmental pollution from car vehicles, railway, sea and river transport ⁸⁴.

Activity of these bodies is outlined and coordinated by the Cabinet of Ministers of Ukraine directly and through the corresponding Ministries, namely:

- State Environmental Inspectorate of Ukraine, State Service of Geology and Mineral Resources of Ukraine, State Agency of Water Resources of Ukraine – through the Ministry of Environment and Natural Resources of Ukraine.

⁷⁷ <http://zakon3.rada.gov.ua/laws/show/454/2011>

⁷⁸ <http://zakon2.rada.gov.ua/laws/show/667-2015-%D0%BF>

⁷⁹ <http://zakon2.rada.gov.ua/laws/show/1174-2015-%D0%BF>

⁸⁰ <http://zakon3.rada.gov.ua/laws/show/521-2014-%D0%BF>

⁸¹ <http://zakon2.rada.gov.ua/laws/show/15-2015-%D0%BF>

⁸² <http://zakon3.rada.gov.ua/laws/show/895-2015-%D0%BF>

⁸³ <http://zakon2.rada.gov.ua/laws/show/393-2014-%D0%BF>

⁸⁴ <http://zakon2.rada.gov.ua/laws/show/103-2015-%D0%BF>

- State Service of Ukraine for Geodesy, Cartography and Cadastre, State Service of Ukraine on Food Safety and Consumer Protection, State Agency of Fisheries of Ukraine, State Agency of Forest Resources of Ukraine – through the Minister for Agricultural Policy and Food Products of Ukraine.
- State Service of Ukraine for Transport Safety – through the Ministry of Infrastructure of Ukraine.

Until 2007 environmental control, although having some disadvantages related to the lack of professional staff and low material and technical resources and cases of corruption, still was effective. Inspectors of environmental control had the right to go to the site where violation or a particular event took place as soon as they learnt about it. Planned measures of control were carried out without any warning of the enterprises. The Prosecutor's Office supervised all the state bodies exercising control over the environment, as well as all natural and legal persons that should comply with the environmental legislation. This led to the fact that control was mainly qualitative, operational and aimed at obtaining objective information on the impact on the environment, the causes of violation, pollution and elimination of these reasons.

On 5 April 2007, the Verkhovna Rada of Ukraine passed a Law «On the Key Factors of the State Supervision (Control) in the Field of Commercial Activity» as of 05.04.2007 № 877-V⁸⁵, which introduced provisions on systemic changes in control procedures:

- 1) Obtaining a permit from a central executive body to unscheduled control events:

In real life it will take from two weeks up to six months or longer to obtain such a permit, consequently, the controlling body cannot go to the site where something happened, halt the violation, find the perpetrators and record all the circumstances of a case.

- 2) Written notification of the commercial entity on scheduled inspection not later than ten days prior the inspection (part 4 Article 5 of the Law):

The enterprises got time to prepare for the inspection, as a consequence, the amount of emission or discharges have been intentionally reduced and the enterprise did not work with its full capacity, etc. Thus, the controlling bodies at the moment of inspection could not get objective information on enterprise performance and the way it affects the environment.

These changes make the foundation for reducing the quality of environmental control. The necessity of obtaining a permit for unscheduled inspection delayed the inspection, which prevented halting the violation, identification of the circumstances and those liable for the violation. Very often it led to the fact that environmental damage left unredressed. Written notification of the enterprises enabled them to prepare for the inspection and stop emissions and discharges for a certain period of time, reduce their amount which made it impossible to estimate actual amounts of the environmental impact made by the enterprises.

At the end of 2012, the State Environmental Inspection departments in rayons⁸⁶ were cancelled and the number of environmental inspectors was reduced, which became another factor that influenced operational efficiency and quality of control.

Next drastic changes in the system of control took place in 2014, when control measures in the field of environmental protection were actually temporarily cancelled. The Law of Ukraine «On the State Budget of Ukraine for 2014» introduced the provision, according to which during August-December 2014 the inspections by controlling bodies took place exclusively

⁸⁵ <http://zakon3.rada.gov.ua/laws/show/877-16/ed20070405>

⁸⁶ <http://zakon3.rada.gov.ua/laws/show/5456-17/print1452608675620040>

on the permission of the Cabinet of Ministers of Ukraine or following the request of the economic entity regarding such an inspection. This provision introduced **moratorium on inspections**, which practically were not conducted – as of the fourth quarter 2014 the number of inspections was reduced by 98,5% in comparison with the 4th quarter of 2013⁸⁷(see Fig. 6).

The moratorium was extended to January-June 2015⁸⁸. In parallel to this, the changes to the Fiscal Code of Ukraine were adopted, according to which the moratorium was extended for the whole period of 2015 and 2016⁸⁹. The inspections of environmental legislation compliance were not conducted in 80% of enterprises and 99% of entrepreneurs⁹⁰.

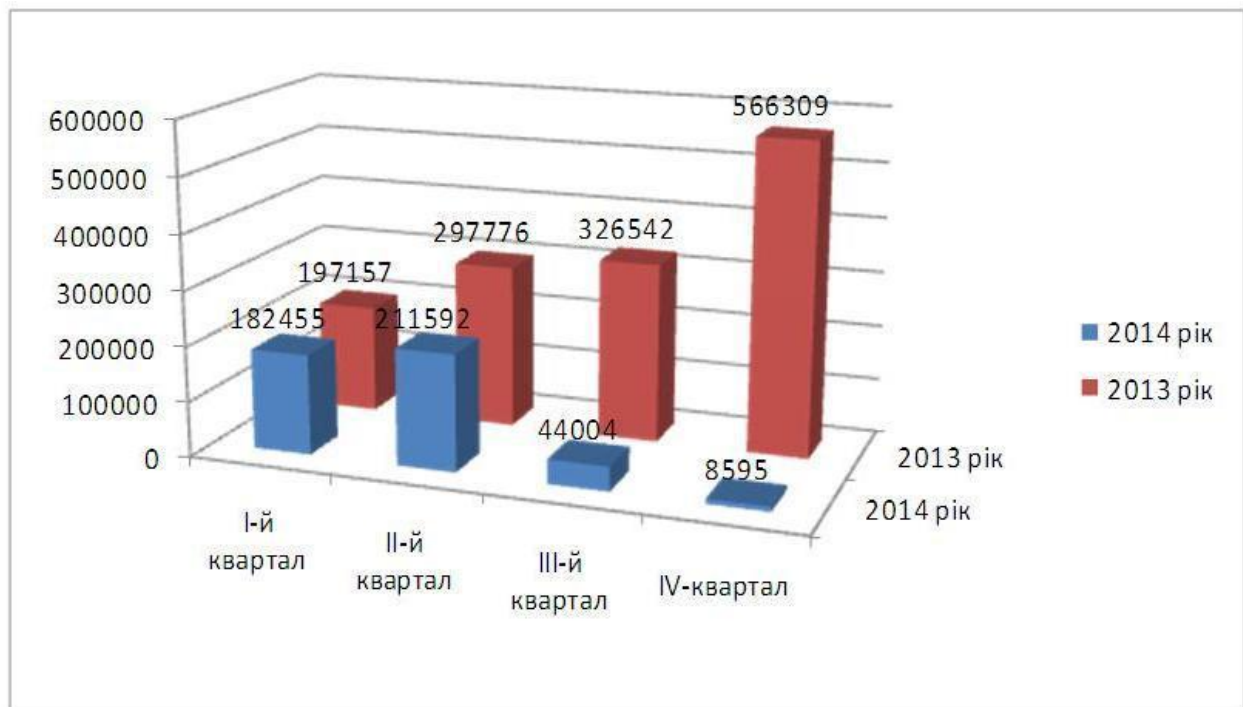


Figure 6. Prepared by the State Regulatory Service of Ukraine⁹¹.

In November 2016 the law was adopted which extended the moratorium on inspections in 2017 with the exception of control in certain fields, in particular inspections of the State Environmental Inspection in the field of environmental protection. The plans of the state bodies on the moratorium for 2018 and the following years are unknown.

Thus, there is a 2,5-year gap regarding inspection of commercial entities for their compliance with the requirements of environmental legislation. The moratorium on inspection has been introduced to liberalize the system of control and create favourable conditions for doing business. It is known that development of business is a very important economy-boosting element. At the same time, development of entrepreneurship cannot take place at the expense of neglecting environmental or any other legislation requirements, as it may result in doing harm for the environment, health and life of the population, as well as the budget of the state.

Switzerland, Canada, Denmark, the Netherlands, Great Britain, Norway that make top ten countries for doing business as of 2017⁹², have strict rules of environmental legislation

⁸⁷ <http://www.dkrp.gov.ua/info/4238.htm>

⁸⁸ <http://zakon3.rada.gov.ua/laws/show/76-19/print1452608675620040>

⁸⁹ <http://zakon3.rada.gov.ua/laws/show/71-19/ed20141228/page13>

⁹⁰ <http://dkrp.gov.ua/info/4463>

⁹¹ <http://www.dkrp.gov.ua/info/4238.htm>

compliance. In these countries business is developing not at the expense of enterprises being exempt from control. Liquidation of corruption factors during events of environmental control also happens not due to cancellation of inspection.

Moratorium on inspection related to the compliance with environmental legislation can be implemented on condition of additional measures that prevent environmental damage. In the opposite case it will be impossible to prevent causing damage to the environment, identification of people who are to blame for environmental pollution, illegal use of natural resources, etc.

Apart from temporary ban on control measures, on the 14 October 2014 the general supervising function of the Prosecutor's Office was cancelled that was the last and very significant driving force for annihilation of the institute of control⁹³.

Till October 2014 the Prosecutor's Office was supervising legislation compliance and application, compliance with the environmental norms by all the enterprises, institutions, organizations, state bodies, including activities of the state environmental control bodies. The Prosecutor's Office had the right to issue acts of prosecutor's response (application) with a requirement to eliminate the violation and the reasons behind it⁹⁴. Thus, in 2014 the mechanism of environmental control quality inspection and environmental damage prevention was cancelled.

Cancellation of rayon departments of the State Environmental Inspection, introduction of the procedure of getting preliminary inspection permit, cancellation of general supervision and introduction of moratorium on inspection resulted in the fact that there was no control over preventing environmental damage and conservation of the environment, as well as violation detection.

On 31 May 2017, aiming to address the issues of inefficient environmental control, the Cabinet of Ministers of Ukraine adopted the Concept of Reforming the State Supervision (Control) System in the Field of Environmental Protection⁹⁵. However, the Concept includes provisions which are similar to the changes mentioned above. For instance, the concept provides for even more extensive reduction of the bodies dealing with environmental protection to 10 territorial agencies at the level of 10 regions, reducing business pressure by means of cancellation of the inspections. It also does not provide for supervision function, etc. Analysis of similar changes happening in the field of environmental control during the previous years does not create grounds for quality control improvement.

The abovementioned changes affected the philosophy of control, its quality as well as the condition of the environment. Due to these changes control over environment has become ineffective. What are the features that can be applied to characterize the current state of environmental control?

2.2. Functioning of the environmental control in Ukraine

The current control is not aimed at environment protection

Control over the environmental condition in Ukraine is now brought down to inspections of a limited number of commercial entities and keeping to the inspection plans. Consequently, results of such control are reflected in the number of inspections conducted and fines

⁹² <http://forbes.net.ua/ua/gallery/1797-krashchi-krayini-dlya-vedennya-biznesu-v-2017-roci>

⁹³ <http://zakon2.rada.gov.ua/laws/show/1697-18/ed20141014>

⁹⁴ <http://zakon3.rada.gov.ua/laws/show/1789-12/ed20131011/print1452608675620040>

⁹⁵ <http://zakon2.rada.gov.ua/laws/show/616-2017-%D1%80>

imposed⁹⁶, and not in the objective environmental indicators (physical and chemical characteristics of water, air and soil).

During the inspection environmental control bodies check whether the corresponding permits are available. At the same time such controlling bodies practically do not check real amounts of emissions, discharges, amount of use of natural resources, presence of the relevant equipment, treatment facilities, filters, etc.

Moreover, during the period of 2,5 years there was practically no control due to moratorium. As a result, there was no protection of the environment even in compliance with the formal legislative requirements.

Control does not prevent environmental damage

Control measures primarily are aimed at recording the violation, however they do not establish all the factors that cause such violations, consequently, these causes are not eliminated.

In addition, the controlling bodies do not have full and reliable information on the condition of the environment. For this reason it is difficult to predict risks that can cause environmental damage in future. In fact, the existing level of control does not prevent deterioration of environmental condition.

Moreover, during the inspection moratorium period there was almost no record of violations, which influenced lack of information on the number of violations, amount of damage caused and subjects causing that damage. Nowadays lack of such information leads to the fact that it is impossible to determine potential risks for environment.

Lack of monitoring function

State bodies of environmental control do not conduct monitoring of the environmental condition. As a result, the authorities, including the Ministry of Environment, do not have full information on the environment and its elements. The controlling bodies are deprived of the possibility to trace changes in the environment and their dynamics. Due to the lack of objective, true and reliable information on the condition of the environment it is impossible to make decisions in the field of environmental management, estimate budget expenditures on the environment and plan environmental actions and policies. Due to the absence of such information it is impossible to make decisions that will have quality impact on solution of environmental problems.

Lack of supervision over the environmental control or why nobody checks the quality of control

Ukraine does not check the quality of control that was carried out. It happens due to the absence of the corresponding supervisory body. Despite the fact that the regulatory base operates with such terms as «control» and «supervision»⁹⁷, they are considered to be identical.

Supervision enhances the quality of control and protects it from potential corruption risks.

⁹⁶ <http://www.dei.gov.ua/menyu-3/2011-12-19-07-30-27/2017/3594-publichnij-zvit-derzhkohinspektsiji-ukrajini-za-2016-rik.html>

⁹⁷ <http://zakon2.rada.gov.ua/laws/show/877-16>

2.3. Procedural issues of environmental control

Legislation gaps, dispersion of control functions

According to the legislation, control in the field of environmental protection is exercised by the State Environmental Inspection, State Service on Geology and Mineral Resources, State Forest Agency, State Geological Cadastre, State Fishery Agency, State Water Agency, State Service of Ukraine on Food Safety and Consumer Protection, State Service of Ukraine for Transport Safety.

The fact that controlling function is shared by different bodies and agencies leads to the situation when the state bodies responsible for environmental control try to shift this duty onto one another. An example of such shifting is the situation with illegal amber extraction. Control over environmental protection in this field is simultaneously carried out by three agencies: State Environmental Inspection, State Forest Agency and State Service on Geology and Mineral Resources. Apart from environmental control, this field is also subject to control on the part of the Ministry of Finance, the National Security and Defense Council and the Ministry of Economy, which resulted in absolute lack of state control over the situation in Rivne, Zhytomyr and Volyn oblasts.

During the moratorium all the aforementioned bodies did not carry out any inspections of environmental legislation compliance. There were allocations of budget funds for these bodies and personnel; but in fact they did not perform their control-related functions. This situation still remains unchanged today (with the exception of the inspections by the State Environmental Inspection).

The State Environmental Inspection does not initiate control

As for the current period, the State Environmental Inspection does not carry out unscheduled inspections and does not take measures on identifying negative changes in the environment and violations of environmental legislation on its own initiative.

For instance, in case the territorial department of the State Environmental Inspection finds out about illegal discharge of sewage water of the enterprise in a water body or emissions into the atmosphere, the territorial body will not go to the place where such discharge or emissions happened or record the violation until it receives a well-grounded complaint of a physical entity.

Environmental control is not prompt

Till the 1st of January 2017, in order to carry out unscheduled control it was necessary to obtain an approval of the central executive body responsible for the state policy in the relevant sector of the state supervision (control).

Obtaining such an approval took from several days up to half a year. When environmental control body finally obtained an approval to carry out unscheduled inspection, the damage to the environment had already been caused, it was difficult to find the guilty party, evidence and information on the violation and its circumstances were lost.

For the year 2017 the provision on getting approval for inspection for the State Environmental Inspection was suspended⁹⁸. The situation on the validity of the provision in question in 2018 is still unknown.

The necessity to get preliminary approval of unscheduled control actions leads to the impromptness of control. Adoption of this provision in future will lead to the situation when even more damage will be caused to the environment and the state.

Scheduled control does not determine the actual impact of enterprises on the environment

Effective control does not determine the actual impact of enterprises on the environment. This is due to the fact that the controlling bodies carry out routine control with a mandatory 10-day warning. In practice, the enterprises that are warned about scheduled inspections often reduce the amount of emissions or discharges, suspend the operations of production facilities etc. before the dates of the inspection. Due to this, it is objectively impossible to determine a real impact of the enterprise operations on the environment during the scheduled inspection. After the inspection, the enterprises resume their normal operation, but the impact of such activities on the environment remains unaccounted for.

During the moratorium on inspections, which is still valid today (with the exception of inspections by the State Environmental Inspection), it was almost impossible to establish, the impact of enterprises on the environment which is why information about the condition of the environment caused by such impact is practically absent.

Control is not conducted at the request of a legal entity

The current legislation of Ukraine regulating the procedure for monitoring compliance with environmental legislation does not provide for the right of the controlling bodies to carry out unscheduled inspections at the request of legal entities, including non-governmental organizations. Correspondingly, if a non-government organization or other legal entity appeals to the controlling authority, the authority refuses the latter to conduct inspection irrespective of the fact which violation of the environmental legislation is reported in the request. At the same time, a legal entity, for example, a non-governmental human rights organization can have objective facts of the violation of environmental legislation.

For the duration of the moratorium control measures were not taken at the request of individuals either.

Control is exercised only in relation to economic entities

Control over compliance with environmental requirements is carried out only with respect to a limited number of economic entities. State environmental controlling bodies have no right to check individuals for the compliance with environmental legislation.

However, an individual also has an impact on the condition of the environment. For example, individuals dump waste into rivers, lakes, create spontaneous landfills, burn waste or dry vegetation etc., which is illegal.

In this regard, the damage caused to the environment as a result of the negative impact of individuals on the environment is not recorded, analyzed or taken into consideration when decisions are taken whether to take measures to improve the condition of the environment.

⁹⁸ <http://zakon3.rada.gov.ua/laws/show/1728-19>

2.4. Lack of resources for environmental control

Absence of the necessary technical means for exercising objective control

Qualitative control requires professional and prompt response. However, environmental monitoring bodies are not equipped with road transport, mobile laboratories and devices for the research of substances polluting the environment. The latest modern laboratories were purchased for 5 oblasts of Ukraine at the expense of the TACIS project. As for today, they do not operate, as the majority of reagents and means for equipment repair are absent.

Such a situation leads to imprompt and formal control.

Absence of professional knowledge

Environmental control bodies practically never carry out systematic trainings to improve the quality of work of their employees. Trainings are not conducted, methods and instructions that would help the inspector draw up a protocol on administrative violation, correctly evaluate this or that permissive document etc. are not prepared.

As a consequence, due to the lack of clear instructions, the employees become even more ignorant of their duties and performance thereof and the environment is only getting worse.

Low salaries

Low salaries create the preconditions for corruption offenses. In addition, a low salary is a factor that contributes to the professional staff turnover and does not encourage employees of the controlling bodies to perform their duties in a qualitative way.

Chapter 3

Alternatives of solving the problems of environmental control

At present, the atmosphere, soil, water resources in Ukraine are extremely polluted, which is confirmed by the data, provided in the first chapter of the book. This state of the environment leads to the emergence of dangerous diseases, including those, which result in premature death. As a consequence, the overall health and welfare of the population deteriorates, and the state loses money due to the illegal use of natural resources, constant additional costs to eliminate the consequences of environmental disasters or to help the population, suffering from living in a polluted environment.

This condition of the environment is directly related to the ineffectiveness of environmental control. Analyzing the existing system of the state environmental control, one can single out three options for solving the problem of its inefficiency, which are described below.

3.1. Option 1. The changes planned at the state level

The changes planned at the state level are included in the Concept of Reforming the System of State Supervision (Control) in the field of environmental protection⁹⁹.

Abolition of the State Environmental Inspection and creation of a new integrated body of state environmental control

The decision requires establishment of a new state body of environmental control. The decision requires development of a number of normative and legal acts on the abolition of the State Environmental Inspection, its territorial bodies, establishment of a new body, its territorial units, determination of the purpose of their activities, the procedure for performing control. Territorial bodies will be created at the level of 10 regions and 27 special oblast inspections as their part, which creates the risk of the absence of control and causing damage at the local level (in rayons, cities, towns, villages).

The new body is established to move from a system of total scheduled supervision (control) to a monitoring system, preventing violations of environmental legislation and performing control based on risk-oriented indicators¹⁰⁰.

Establishment of a new body without expanding the network of territorial bodies to the level of regions and without granting these territorial bodies the right to promptly travel to the venue etc. can lead to the situation when risks of causing damage will not be detected in time, and the violations will not be timely registered and stopped. At the same time, implementation of the monitoring function by the newly-created body will qualitatively change its performance in comparison with the current one in terms of preventing harm, predicting occurrence of possible environmental risks, and determining dynamics of changes in it. Without changing basic principles of state control in the field of economic activity and differentiating functions of supervision and control, the new body has the chances to differ from the functioning one only by the system of bodies, the monitoring function and the number of inspections, and in fact will not be able to achieve the goal of its establishment.

Introduction of monitoring

The concept provides for the introduction of monitoring, which will affect the quality of environmental control in Ukraine.

The decision envisages creating a network of laboratories to monitor condition of the environment and organizing laboratory arbitration services, developing legal acts on establishment of the laboratories and on the procedure of performing monitoring.

The monitoring will make it possible to obtain information about the real condition of the environment, the level of pollution and the volumes of use of natural resources. Monitoring data will make it possible to trace the dynamics of environmental changes. These data will be used for decision-making and public policy planning in the area of environmental protection and sustainable development.

Cancellation of compulsory scheduled control of small and medium business

⁹⁹ <http://zakon2.rada.gov.ua/laws/show/616-2017-%D1%80>

¹⁰⁰ <http://zakon2.rada.gov.ua/laws/show/616-2017-%D1%80>

The concept provides for the cancellation of scheduled control measures in relation to 99.8% of domestic entrepreneurship¹⁰¹. The purpose of conducting scheduled inspections is to prevent harm, verify compliance with environmental requirements and provide time for correcting violations. A scheduled inspection reveals violations that may cause environmental damage in the future.

Implementation of the solution requires development of draft regulatory and legal acts on the abolition of scheduled control measures, on changing the procedure and the grounds for implementing control measures.

Such a solution will lead to almost full elimination of scheduled inspections and decreasing workload of control bodies. However, implementation of this solution will make it impossible to identify the risks of causing harm by specific enterprises, which contradicts the goal of preventing damage to the environment. Based on this solution, control measures will be significantly decreases and will mostly include unscheduled inspections.

Establishment of public inspectors at the local level

Public inspectors who will carry out their activities on a voluntary basis, in their spare time. Implementation of the decision requires development and adoption of the procedure of environmental control by public inspectors, amendments to the current legislation on inspectors' rights to issue protocols and to impose administrative punishment.

Introduction of the public inspectors institute, on the one hand, will ensure implementation of public environmental control, which, in some cases, may be more prompt than the state one. At the same time, public inspectors are not controlled by and accountable to the bodies of the state environmental control. Implementation of such a decision creates corruption risks.

The option of decisions approved on the state envisages creation of a single integrated state body for environmental monitoring and supervision (control) with a new system of territorial bodies. Most of the changes concern the reduction in the number of inspections, actual cancellation of scheduled inspections, blending of supervision and control functions, and even if monitoring is introduced, it will not provide for a full-fledged qualitative change in the control over the condition of the environment. This will not allow full protection of the environment, and, accordingly, such decisions practically will not affect the creation of adequate living conditions for Ukrainians.

3.2. Option 2. Partial change of the existing system and philosophy of control.

Changes in the purpose of control

Change description: This solution involves changing the purpose of control, which should be to protect and preserve the condition of the environment. The purpose should be achieved by preventing damage to the environment and conducting qualitative, rather than quantitative, inspections. Control should not be carried out to make business accountable, but to help identify risks and seek and implement joint solutions in preserving the environment.

What does it take: To implement this solution, it is necessary to elaborate and adopt changes in laws and regulations related to the purpose of implementing state environmental control, as well as the implementation of control measures.

¹⁰¹ www.dkrp.gov.ua/files/042dbf480c.doc

Possible qualitative consequences: Implementation of the solution will lead to control measures becoming qualitative and will be aimed at establishing risks, facts, causes of damage to the environment, their elimination rather than formal inspection of the availability of permissive documents.

Introduction of monitoring

Change description: Introduction of the monitoring function requires establishment of monitoring units in the central body of state environmental control and its territorial units, expansion of the network of laboratories, establishment of think tanks, elaboration and adoption of a regulatory act on monitoring procedures, creation of a database for storing the information obtained, creation of laboratories within territorial bodies, creation of departments for the analysis of monitoring data. Monitoring should be carried out systematically, starting with monitoring at the enterprise to analyzing information at the national level. The monitoring data should be analyzed by special departments and made public, and also should be the basis for making managerial decisions in the field of environmental protection.

What does it take: Elaboration and adoption of draft regulatory legal acts on the implementation of monitoring, establishment of a network of laboratories and implementation of research by laboratories. Allocating, searching for other funds for the creation of laboratories and monitoring systems. Training of employees regarding their ability to analyze the information collected and formulate proposals for measures to improve the condition of the environment.

Possible qualitative changes: Obtaining information on the condition of the environment, monitoring the dynamics of changes, determining the factors of impact, predicting possible changes, and elaborating appropriate solutions based on the received information on the condition of the environment. Quality management of the environment and prevention of damage to the environment, rational use of funds for environmental activities.

Expanding the circle of persons to whom control measures will be implemented

Change description: Introduction of inspections, including unscheduled ones, not only of economic entities, but also individuals, state authorities and local governments, which will allow preventing and detecting damage caused to the environment as a result of the actions / activities of any entities.

What does it take: Implementation of the solution requires elaboration and adoption of a regulatory legal act on the procedure for the implementation of state environmental control.

Possible qualitative changes: identification of a wide range of impacts and possible risks of causing environmental impacts, preventing harm, raising environmental awareness of citizens.

Ensuring promptness of inspections

Change description: The solution envisages granting the bodies of state environmental control the right to travel to the venue in time without prior approval of such actions by the higher or any other bodies.

What does it take: Elaboration and adoption of changes in the basic principles of the implementation of state control as far as the implementation of unscheduled control activities is concerned.

Possible qualitative changes: Implementation of the solution will ensure independence of the state environmental control bodies, and will also allow recording all the circumstances of the

violation and causing damage and will allow timely identification of the causes of events and the perpetrators. After implementation of this solution, the number of cases when the circumstances, causes of pollution, perpetrators are not established will be reduced. As a consequence, the possibility of recovery for the damage caused to the environment will increase. In addition, the amount of damage caused will decrease due to the possibility to stop it promptly.

The solutions envisage partial changes in the current system and philosophy of environmental control as well as in its goal. The changes are aimed at obtaining information about the condition of the environment, predicting possible risks to the environment, preventing harm, ensuring promptness of control. However, qualitative change of the control system can be achieved only with full-fledged systemic changes.

3.3. Option 3. Radical changes of the state environmental control

Change of the purpose of the state environmental control

Establishing of the new state body for environmental control

Change description: The decision provides for establishing of the independent state body of environmental control the purpose of which will be to preserve the environment. This body will function as monitoring and control authority. Its territorial units will be established on the level of oblasts and rayons. Territorial units will be equipped with laboratories. This body will be vested with the right and provided with logistics capabilities to take environmental control measures in a timely manner. It will delegate its powers to the local self-government bodies and territorial communities providing feasibility of exercising of the delegated environmental control functions.

What does it take: The decision requires development and implementation of regulatory acts on establishing of the new body for environmental control, its powers and territorial units; on the control procedure as well as introduction of amendments to the legal acts currently regulating the environmental control procedure and also elimination of duplication of powers.

Possible qualitative changes: The decision implementation will lead to the changes of the quality of control.

Introduction of monitoring

Expanding the circle of persons to whom control measures will be implemented

Ensuring promptness of inspections

Establishing the supervising body

Change description: The decision provides for the establishment of the independent body responsible for supervising the activities of the controlling authorities (quality control and control of the way the controlling bodies exercise their powers).

What does it take: Implementation of the solution requires development and adoption of the regulatory act on the supervising body, its territorial units, on the supervision procedure as well as on amendments of other regulations. The solution requires significant budgetary allocations for establishment of the new body.

Possible qualitative changes: After establishment of the independent supervising body the quality state environmental control bodies operations should improve. The supervising body will inspect the quality of state environmental control and prevent occurrence of potential corruption risks. Should certain violations on the part of controlling authorities be identified,

the supervising body will make relevant recommendations and improvement notices and also will have the right to suspend the enforcement of illegal decisions made by the controlling bodies simultaneously bringing the matter before the court. The key criterion of proper environmental control operation will be the condition of the environment. If it deteriorates, it means control is inefficient, it fails to detect and eliminate causes of environmental pollution.

Expanding the circle of persons to whom control measures will be implemented

Change description: Currently one of the preconditions for taking measures of unscheduled control is availability of a request from a natural person. The decision envisages that the right to address the control body will be also given to legal persons including environmental NGOs etc.

What does it take: Implementation of the decision requires amendments to legal and regulatory acts on the procedures of state environmental control.

Possible qualitative changes: Implementation of the solution will lead to improvement of public environmental control and will help the control body to identify potential risks of environmental harm and facts of violations.

Ensuring resources for environmental control

Change description: The solution envisages provision of the environmental controlling bodies with transport vehicles, equipping the laboratories with proper equipment and chemical agents as well as pay rise to the employees of the environmental controlling authority.

What does it take: implementation of the solution requires budgetary allocations, searching for the other means of funding for procurement of specialized equipment for laboratories and transport means.

Possible qualitative changes: as a result of solution implementation the staff of the controlling bodies will really be capable of performing their duties and powers.

Radical changes will lead to the full-scale modification of the state environmental control system, particularly in the part of changes related to the purpose of the control performed, prevention of damage, promptness, obtaining information on the condition of the environment and dynamics of environment-related changes as well as elimination of corruption risks.