THESIS

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MSc Environmental Engineering

Responsibility of Operator to Remedy and Repair Environmental Damage

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Dr. Csegődi Tibor László, tanársegéd

signature

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ABSTRACT OF THESIS

Responsibility of Operator to Remedy and Repair Environmental Damage

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Keywords: Environmental Liability Directive, Remediation, Operator, Responsibility, Damage.

- Abstract:

Environmental responsibility is everyone's duty; in this thesis, we are looking for the responsibility of the operator in dealing with environmental damage.

An overview of the European environmental responsibility law (ELD), the German and Syrian environmental laws, a look at the steps of the environmental remediation process by citing examples of environmental incidents that have been judged and the damage that has been dealt with, the extent to which companies are committed to applying and complying with environmental laws, the responsible for remedying environmental damage when it occurs, and the responsibilities of the operator, questions were answered through a comprehensive questionnaire, there is a direct relationship binds between the activation and obligation of the environmental responsibility to operators, and treat the affected places if they are responsible for this damage, as some environmental damages may not be the responsibility of the operator alone, where a causal relationship must be proven, and more rapid and strict procedures are required in the case of environmental accidents, raising environmental awareness is a very important requirement at all times as well as the public must be provided with more accurate information about the number of places that need remediation in their areas of residence, and to involve them in decision-making, as it was noticed that the public is largely ignorant of such information.

1 -Introduction

Accidents and problems occur periodically in our lives, and the existence of laws is an important control whose function lies in solving these problems, preventing them from recurring, and holding the defaulters accountable.

This is how the environment needs a law that protects it and all its components since it is the inhabitants for all living organisms and the source of resources, and the existence of the environmental law, the so-called ELD, which entered into force in 2007 with regulations and legislation that would reduce accidents as a result of omission or error, which is usually the operators of the activities that caused their occurrence (as a result of neglecting the means of protection and preventing damage, or because of neglecting periodic repairs in order to avoid additional costs by the operator).

The environmental protection law obligates any operator to apply all preventive measures before starting the operation of the facility, as the environmental protection law does not only require repairing pollution or damage that has already occurred but rather goes beyond it to prevent new damages from occurring through preventive measures that have had an effective role over time.

The operator does not include only the executive director but all employees who have an administrative role, according to German law, the operator is the owner of the land or the operating building.

The operator can be a specific person or an entire entity, as the responsibilities of the operator cannot be borne by one person, the primary and most important task of the operator lies in ensuring the safety and security of the entire operation process and minimizing the operating risks.

Ensuring the safety and protection of people's lives, health, and property, as well as protecting the environment, water, air, and soil and not harming or neglecting them, proper disposal of waste and products of their industrial operations, controlling emissions, and treating them before they are released into the air.

2 -Literature Review

2.1- Damage from an Environmental point of view:

Damage in the general sense means physical harm or a change in the structure of the thing in a negative way that results in equal consideration, either material or moral, for which the cause must pay. Damage has many forms, one of which is environmental damage, which today receives unprecedented global attention.

Environmental damage occurs because of industrial accidents and penetrates the environment surrounding the place through pathways linking the site and environmental receptors, the flow of this damage may occur in solid form, liquid form, or gas form.

This damage may have a local effect and may exceed it to have a global scale impact; the living biomass is affected by this damage due to many factors; environmental damage negatively affects the cycle of elements in nature if this damage is massive; damage may affect water, air, soil, people, and the surrounding environment; and it may affect biodiversity. (Vince *et al.*, 2008) (Lim *et al.*, 2022)

For the occurrence of environmental damage, there are reasons that led to its occurrence or factors that contributed and helped in its occurrence or in increasing its impact, these factors are called damage factors DF, these factors differ in the way they affect the occurrence of damage and in the way they appear in nature, it may be cumulative in the sense that it gradually worsened for a period of time until it reached a limit that cannot be controlled, this type is characterized by the fact that its effect cannot be detected directly, given that the effect is in small quantities that increase gradually, if it was possible to observe this type of factor, there is an opportunity to avoid major disasters. (C (2021) 1860)

The other type of factor is characterized by the element of surprise, which occurs without prior warning and therefore has an immediate and direct impact and causes many disasters due to the lack of an opportunity to take caution before its occurrence, as it cannot be predicted. (C (2021) 1860)

These factors also differ according to their nature; in the event of the disposal of pollutants and their addition to the surrounding environment, they are of an additive nature. (C (2021) 1860)

In the case of cutting down trees, for example, it is of a disposal nature, and if it leads to the death of a living being, it is of a destructive nature. (C (2021) 1860)

2.1.1- Environmental damage analysis:

When environmental damage occurs, there is an urgent need to know the dimensions of this damage and the size and quality of the losses that resulted from it. By doing data analysis, quantitative, chemical, economic, and toxicological data modelling and logical analysis may be used, the integration of this information is the way to determine the extent of the damage to the resources and species that should be compensated.

It is also important to know the possible transmission paths for this damage, meaning to what extent it can extend, causing an increase in losses.

Will it seep into the groundwater, or will it move with the surface water, penetrate the soil layers, or fly in the air for long distances?

Knowing the concentration and type of materials that led to this damage is important and essential to getting a good estimate of the effects in the long and short term.

All this information and data is important to give a complete and integrated picture of the nature of the current situation of environmental damage.

Each incident has different characteristics from the others in terms of place, time, and the nature of the industrial or economic activity practiced, but whatever the incident, it is always necessary to start an assessment: the existence of natural protected types, the hydrology of the place, the nature of the existing water bodies, and the geological location. (Lipton and LeJeune, 2018)

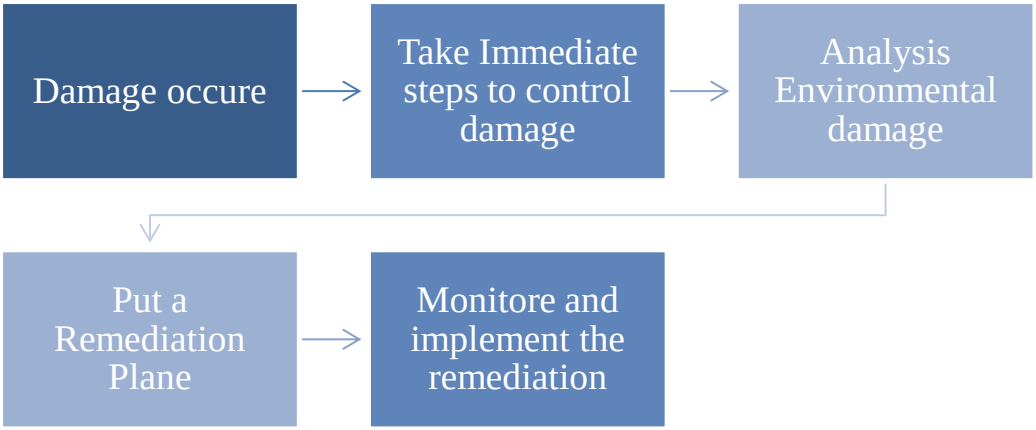

Figure 1: Implementing the ELD

Source: https 1

2.1.2- Impact of Damage on Natural Resources

For a better analysis of the environmental damage, its consequences, its extent, and whether it can be measured, therefore, it must be taken into account what is the natural range that receives this damage or is affected by it, will the impact affect a type of natural resource such as natural habitats or water, for example, water that is considered as a natural resource can provide protection for wild birds from thirst, which is considered as a function of this natural resource. (C (2021) 1860)

Damage may take several directions, it may individually affect water, soil, vegetation, habitats, or it may affect several elements together. (Lipton and LeJeune, 2018)

- Water:

- Surface water: water is considered damaged when the quality of water and its suitability for different uses changes due to its exposure to certain chemical or physical conditions.

Substances that seep into surface waters affect several factors such as pH, temperature change, or turbidity, which lead to a loss or negative impact on plant or animal species living in these waters, it is also possible to lose the multiple uses of this water (transportation - fishing - entertainment - irrigation), damage may lead to restricting access to these water bodies until they are cleaned, thus temporarily or permanently losing their services.

- Groundwater: it is a very important source of drinking water, and the occurrence of damage to groundwater because of a specific accident or circumstance means impeding and restricting

our access to this source for a specific or permanent period, depending on the nature of the damage that occurred, which led to a change in the toxicity and limiting thresholds that make this water unsuitable for use.

- Soil: it is a mainstay in our access to food and it is a habitat for many animals, damage to the soil means affecting productivity on the one hand, which reaches humans, and affecting its viability as a habitat for many species on the other hand, the form of this damage to the soil may have led to a change in the properties of this soil, its ability to retain water, its permeability, or the bonding of its particles.

- Vegetation: the damage that occurs to the vegetation cover is often related to the damage that occurs to the soil, which is very difficult to rehabilitate in a short time, the damage to the vegetation cover affects the abundance of food and medicine that depends on the plant mainly, it also affects the aesthetic and recreational value enjoyed by the vegetation cover.

- Habitats: the damage that occurs to habitats is closely related to all the aforementioned elements (soil - water - vegetation), because any damage to any element that is already considered a habitat for many species will directly affect the species that live and depend on it, if water damage occurs, all species that live in this water will be affected, if a vegetation cover is damaged in a certain area, this will affect the species that depend on this cover for their food, so it is not possible to deny the effect of all the elements on each other in one way or another, as the occurrence of a damage in a place does not negate the arrival of the effects of this damage to other places , as all nature is interconnected through cycles of elements and food chains.

- Air**:** (*Effects of Air Pollution | Center for Science Education*, no date)

The damage to the air leads to the so-called air pollution, which means the entry of foreign substances with different concentrations that change the quality of the air that all living breathes, which has clear effects on public health.

Air pollution also leads to many phenomena that in turn are harmful and have undesirable effects such as acid rain (which affects vegetation and soil) and climate change, air pollution affects plants and animals as well and may cause allergies or damage to the respiratory system.

2.2- Responsibility from an environmental point of view:

2.2.1- Directive 2004/35/EC ELD Environmental Liability Directive:

The Environmental Responsibility Directive entered into force on April 30, 2004, EU member states had three years to convert the directive into domestic law, the ELD transfer was completed by April 2007.

A framework based on the principle of the (polluter pays), in order to show the financial responsibility of the operator to repair the environmental damage he caused, in order to ensure the protection of the environment and the repair of environmental damage.(D. Grant LAWRENCE, 2006) (*Liability - Legislation - Environment - European Commission*).

For the scope covered by the Environmental Liability Directive includes water, land and protected habitats, the damage associated with protected species and habitats includes bird guidance and habitat guidance, insurance companies will not be able to cover operators in situations such as biodiversity damage due to the disability to quantify the damage caused, this damage can lead to exorbitant demands that may destroy the operator and frustrate the project, such as illegal bird hunting, noise, spills, destruction of reserves and any activity that may negatively affect the presence of the reserve or species. (European Commission. Directorate General for the Environment., 2013) (Fogleman, 2020)

Water-related damage includes surface, groundwater, coastal, marine, and transitional water, the damages such as the discharge of chemicals or harmful substances into surface or groundwater that may alter the state of the water or its ecology or affect the species in which it lives. (European Commission. Directorate General for the Environment., 2013) (Fogleman, 2020)

The land damage is the only category of damage for which there is no EU legislation, there was previously proposed for soil protection but was rejected after several member states disagreed with it, damages to land such as contaminating it with heavy metals or disposing of unauthorized waste into the ground. (European Commission. Directorate General for the Environment., 2013) (Fogleman, 2020)

There are some ranges that are not covered by the Environmental Liability Directive such as air pollution or emissions because they have been considered as a public hazard (everyone uses a fireplace in the home or drives a car in the street and therefore uses fossil fuels and contributes to the emission of gases to the air), nor does the law cover any incident that occurred before 30

April 2007 or if it has been more than 30 years old. (European Commission. Directorate General for the Environment., 2013)

It also does not include damage resulting from armed conflicts or any activity to ensure the security of the State. (European Commission. Directorate General for the Environment., 2013)

2.2.2 - Evaluation of ELD directive:

The only way to survive today with so many environmental problems is through a group of efforts that all people, whatever their occupation and age, must bear, because it is in the interest of humans first and foremost. Its goal is to save the planet and feel responsible enough to avoid new damage. It is a human, moral, and legal value in the sense of the obligation to perform a certain duty towards a person, society, or the environment.

The environmental directive is assessed based on several characteristics and features that it must fulfil, such as relevance, effectiveness, coherence, efficiency, and added value.

The directive must be relevant to the current state of economic activity so that its legislation is kept abreast of it and is constantly updated and developed based on the evolution of the economic wheel and the entry of new occupations and materials into the market and thus into the environment periodically.

States following the directive must note the results of their follow-up in the sense of its effectiveness on the ground and whether there are concrete and realistic results to be observed, also, the linkage and harmonization of the directive with other laws and legislation (coherence) in any country is so important that the work of one of them does not hinder or interfere with the other's function.

A directive must also prove its efficiency: is it applicable, does it achieve its desired objectives, or does it cause an impediment to activity operators? The existence and imposition of any directive of this magnitude inevitably adds something to the countries that it pursues, in our sense, to move them forward for the better, towards a protected and sustainable environment in which resources and habitats are protected in an orderly and coordinated manner. (*COMMISSION STAFF WORKING DOCUMENT REFIT Evaluation of the Environmental Liability Directive Accompanying the Document Report from the Commission to the European Parliament and to the Council pursuant to Article 18(2) of Directive 2004/35/EC on*

environmental liability with regard to the prevention and remedying of environmental damage, 2016) (*REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT: Report from the Commission to the Council and the European Parliament under Article 18(2) of Directive 2004/35/EC on environmental liability with regard to the prevention and remedying of environmental damage*, 2016)

2.2.3 - Environmental Liabilities and Responsibilities Implementation Mechanisms

Liabilities and Responsibilities are determined by the laws of each state, these liabilities vary formally according to their source to be compliance obligations, remediation, fines, compensation or Punitive damages.(CFI team, 2020)

- Compliance obligations represented in the regulations and laws that determine the mechanism used in the use and disposal of chemicals and may include the costs of staff training to deal with these materials.(CFI team, 2020)

- Remediation it consists in treating the damage caused by the economic activity of this company to the environment, represented by water, air and soil.(CFI team, 2020)

- Fines: Companies must pay fines and penalties for non-compliance with environmental laws and regulations, the amount is determined by a public agency that will assess the environmental impact of the violation.(CFI team, 2020)

- Compensation: Compensation obligations include compensating people for their loss or damage to their property, or the compensation may be due to individuals losing their lives as a result of the activity of this company.(CFI team, 2020)

- Punitive damages: it is similar in concept to compensation obligations, but differs with it, with the high amount to be paid, which may reach very exorbitant amounts, the aim of which is to deter the company from its practices, and of course deter any other company from engaging in the same behavior of this company.(CFI team, 2020).

2.3 - Operator:

The operator can be a person or company, whether public or private, that owns this economic activity and has the required permission to operate it.(D. Grant LAWRENCE, 2006)

The operator considers that it has nothing to do with the damage if it proves that there is a third party involved in its occurrence or if the damage is caused as a result of the application of

instructions from the authorities. (European Commission. Directorate General for the Environment., 2013)

Environmental Liability Directive requires the operator to take preventive measures for all its authorized activities to prevent any possible damage to the environment, and not to exceed the permissible limits of damage to water, air, or natural habitats. If the threshold is exceeded or an environmental disaster or accident occurs, the operator must take responsibility and make repairs.(Fogleman, 2020)

Environmental responsibility law provides an option for states to take (right of defense) for authorized activities, in which case the operator is not obligated to pay the costs of treatment and take responsibility if it is proven that he was not negligent and did not do anything wrong in operation progress.(Fogleman, 2020)

The obligations under the directive vary depending on the situation of the damage and fall under three categories: (C (2021) 1860)

A. If there is an explicit threat and indications but the damage has not yet occurred, in such case the operator must take caution and take all preventive measures so that things are under control.

B. If environmental damage occurs here, the operator must take over immediately and try to control and contain the damage as much as possible and remove any damage or effects that can be removed, there is an annex in the directive containing the immediate management guidance of the damage factors.

C. Also in case of environmental damage, (stage after the attempt to control and manage environmental damage), at this stage, the operator must determine the appropriate treatment mechanism for the damage in terms of its size, location and time and develop a complete integrated plan on how to start this phase and submit it to the competent authorities.

Operators also have more than just environmental responsibility for remediation, it is to report promptly and without delay any environmental damage and not to try to hide it on the pretext of trying to resolve it alone or on the pretext of evading responsibility, they must also report any potential environmental damage to be on the safe side in case of damage and provide any additional data and information that will help the authorities to avoid environmental disasters. (C (2021) 1860)

The operator has the full right to listen to him and his position before taking any action against him by the authorities. (European Commission. Directorate General for the Environment., 2013)

Normal Situation	Threat / Damage situation
Take precautions based on environmental directives.	Take urgent and immediate steps to manage and control damage as much as possible.
Develop additional procedures to minimize damage if it occurs.	Informing the authorities of the situation as it stands directly and without delay.
Regulate and guarantee financial insurance in case of damage.	Follow instructions and instructions to deal with the disaster as directed.
	Development of a reform plan and identification and submission of remedial measures to the authorities

Figure 2: Operator Obligation in Different situation

Source: https 2

There are two types of operators according to environmental directive, there are operators of dangerous occupations (classified in annex III in the directive) such as (mining - GMO - waste transport license - carbon capture), and another occupation operator (that's not classified in the annex). (European Commission. Directorate General for the Environment., 2013)

Depending on this, environmental liability is also divided into two types: strict liability and liability based on error or fault, in the case of operators of dangerous occupations, there is no need to establish a causal link between damage and the operator (strict liability), but in the case of operators of other occupations, there is a need to establish the causal relationship (negligence - error) before being held liable (fault based liability). (European Commission. Directorate General for the Environment., 2013)

In case of damage to natural habitats or reserves, the operator is directly liable without the need to establish any causal link. (European Commission. Directorate General for the Environment., 2013)

The imposition of absolute liability on dangerous activities to ensure their activities and to ensure that operators follow maximum levels of protection and safety to guarantee that nothing goes wrong, because error in dangerous operational areas can lead to serious consequences for human life. (Salanitro, 2015)

Some States believe that the strict liability for damage law should be applied to all activities and not only limited to those listed in Annex II below. (Fogleman, 2020)

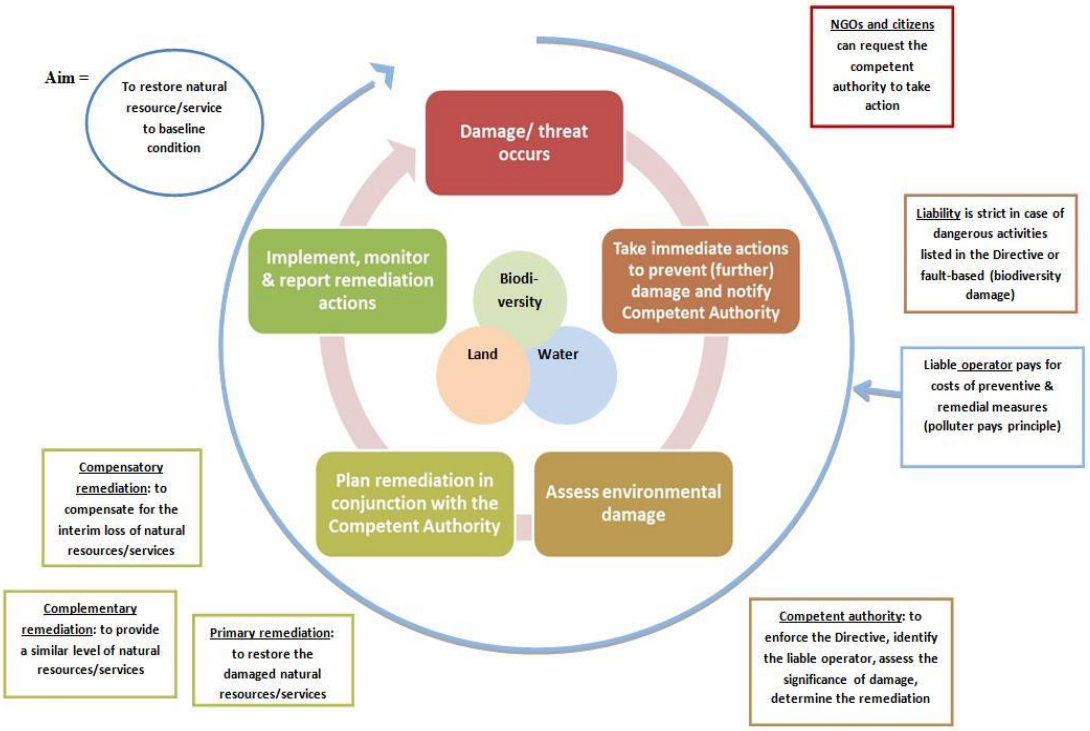

Figure 3: Overview on the functioning of the Directive.

Source: https 3

2.4 - Overview on German Liability Law ELA (Environmental Liability Act)

The law was issued in December 1990 and entered into force on 1/1/1991, a strict approach and detailed legal bases for the application of environmental responsibility in Germany and beyond its territorial borders as well, obligating the operators of industries and companies to have sufficient knowledge of the legal aspects of environmental responsibility and to implement their obligations in the event of damage to the three elements of the environment Water, air and soil, as well as harm to people and property.(Hoffman, 1991) (Elspaß and Feldmann, 2021)

District authorities usually direct the Ministry of the Environment to implement the law, NGOs that use specialized lawyers usually participate in hearings in making environmental laws and this can lead to judicial procedures that lead to closing or changing projects if these projects have environmental impacts. (Elspaß and Feldmann, 2021)

There are many measures taken against operators according to the damages they cause, which may include financial fines and compensation for damages to property or people in case of injury or death. It also shows that there is no responsibility in the event of accidents that occur because of force majeure circumstances.(Hoffman, 1991)

2.5- Overview on Syrian Liability Law

Based on the provisions of the constitution and what was approved by the people's assembly in its session held on 26/06/2002, Law No. 50 on environmental affairs was issued and published in the official gazette on 8/7/200, the law consists of 8 chapters, environmental responsibility and compensation for damages fall within Chapter VII.('Syrian Environmental Affairs law', 2002)

The law provides for the violation and disability of the owners of establishments with industrial, economic, tourism, development and agricultural activities with a financial offense and a prison sentence, this period and the amount shall be determined by the authority's board according to the violation committed by the facility.

The authority also obligates the owners of facilities to remove pollution for a certain period to be determined by the authority, and if the facility does not respond to this decision, it will be closed completely.

The law also obliges anyone who causes damage to the environment or to living things, whether intentionally or unintentionally, negligence or lack of precaution, to pay full compensation to return the situation to the way it was before the damage.

The very strict side of the Syrian environmental law appears in those who contribute or assist in the transit of nuclear or radiological materials into Syria with the intention of storing, burning, dumping, or disposing of them in any way, with imprisonment for a period of five years and a fine ranging from 3 million to 10 million Syrian pounds, (which is equivalent between 12 million to 40 million dollars).('Syrian Environmental Affairs law', 2002)

On March 25, 2012, the Environmental Law was updated all tasks were entrusted to the Ministry of State for Environmental Affairs, which is fully responsible for the mechanism of implementing the law.

The previous/former legal regulations were amended with the need to prove a causal relationship between individuals or companies and damage, due to the possibility of directing

environmental responsibility to them, the decision was amended in the period of conflict, so it was not promoted as it should.(‘Environmental Law - Syrian Law Journal’)

2.6- Comparison Between EU and German and Syrian Environmental Law

EU	German	Syrian
Dedicated to all EU countries with Germany.	Specific to Germany and covers environmental issues within its borders only.	Special to Syria and covers environmental issues within it.
The regulations are implemented by the European Commission.	Federal agencies Nature Conservation and Nuclear Safety (Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit) are responsible for implementing the regulations.	The Ministry of Local Administration and Environment and its Directorates is responsible for implementing the regulations.
Covers a wide range of issues (biodiversity - climate change - resource protection)	Issues such as air pollution, waste management and soil protection are particularly concerned.	It is concerned with environmental protection in general, but its regulatory framework is less comprehensive and often not strictly implemented.
There are minimum standards that Member States must meet.	It often exceeds the minimum standards of European law for stricter standards.	The standards are less sophisticated and comprehensive than the German and European versions and fragmented.
Operators are required to obtain permits before starting activities, these permits include requirements and conditions for monitoring and reporting emissions, operators may be held liable for damages but the error is taken into account.	Operators are strictly liable which means they are fully liable for damage.	The operator is required to meet permit, processing, monitoring and reporting requirements but there is a lack of clarity about the operator's responsibilities and enforcement is often lenient.
Significant and strict penalties amounting to fines, withdrawal of licenses and imprisonment.		Penalties are less severe and often not carried out due to institutional corruption.

Figure 4: Comparison between different law legislation

Source: https 4

2.7- Obstacles to Environmental Responsibility Law:

The environmental responsibility law suffers today from several problems, the most prominent of which is the need to prove the causal relationship between the polluter or the emitter and the pollution, without a relationship or evidence, nothing can be done.(Wandt, 2020)

Several factors differ from one country to another and from one region to another that determine the weakness of the environment and its need for protection.(Wandt, 2020)

When we talk today about environmental protection, we never face the problem of lack of knowledge or lack of understanding by the public or companies of the concept, rather, we suffer from a problem of implementation, which is directly related to the behavior of governments waiting for voluntary change in human behavior to protect the environment, Here in particular, it should be noted that environmental legislations are like any other legislation in the state must be mandatory, following rules and regulations like any other law.(Wandt, 2020)

In order to be fair, the protection of the environment by any government or entity requires the financial strength, which without it no country will be ready for this measure, taking into account achieving a balance between social prosperity, economic development and environmental protection for any country.(Wandt, 2020)

The law of environmental responsibility in the German faith does not provide for today the responsibility for collective harm, in the sense that climate change today is caused by global warming, which in turn is caused by carbon emissions as a result of economic activities, and this is due to the fact that carbon dioxide is a natural gas that has been present in nature since it is not harmful to human and animal life, but what causes problems today from climate change is the increase in the population with the removal of forests that absorb a significant part of carbon emissions and the increase in demand for economic activity, so it is not possible, according to the law, to link the problem and prove its relationship with economic activity directly.(Wandt, 2020)

The law includes compensation for individual damages that have necessarily proven the relationship between them and the behavior of the emitter (operator), the necessity of this proof is what many environmental experts disagree on today because in many cases it is not possible to prove and therefore shown the ineffectiveness of the law, this does not negate that

The law punishes operators who violate preventive measures and who exceed the minimum emission thresholds stipulated in environmental laws, and the necessity of treating and reducing

the emission of each facility to its minimum limits before releasing it to the environment, all of this is under control.(Wandt, 2020)

3- Remediation

Technique used to clean up pollution resulting from an industrial process. in other words, the process of removing dangerous substances from the environment or reducing their negative effects.(Muralikrishna and Manickam, 2017).

Remediation projects vary according to the existing damage situation, it may be biological treatment, isolation, physical and chemical methods or thermal.

The most important than the method used, is the goal to be reached at the end of the treatment process, the remediation method must lead to treating the basic damage that occurred in the environment and returning the situation to what it was before the damage.

If the initial treatment is not sufficient to reach this goal, additional treatment measures must be introduced to help reaching the goal.

It is also desirable to provide compensation in the period between the occurrence of the damage and its treatment until the return to previous period before damage.

This enhances people's confidence in the Environmental Liability Law by ensuring that the rights of any person who has suffered a loss or was affected because of this damage are not lost.

The Environmental Liability Directive stipulates two types of remedial action for harm: short-term and long-term procedures; short-term procedures are effective in emergencies; prompt response to damage; an attempt to control it, neutralize it, minimize its impact, or ensure it is not extended offsite. (‘CELEX_02004L0035-20130718_EN_TXT.pdf’, no date)

Long-term remedial measures that require a long time to run include procedures for treating the affected area, attempting to restore or repair it, and if it is lost permanently or temporarily, finding alternatives to services that are lost as a result of the damage. (Fogleman, 2020)

Treatment of damage to water and protected habitats can be achieved through three types of treatment that can be followed depending on the damage and condition: Primary, supplementary, and compensatory treatment.

The first treatment is the one that is followed in case there is a possibility of returning the area to its original state before damage occurs, at a time that does not affect humans or the environment. (REPORT FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE *COMMITTEE OF THE REGIONS* Under Article 14(2) of Directive 2004/35/CE on the environmental liability with regard to the prevention and remedying of environmental damage, 2010) (Fogleman, 2020).

If the initial treatment is inefficient, supplementary treatment is followed in an attempt to secure a service level of the same quality as the damaged service or supplier.

When other methods or mechanisms fail to restore the situation, it is the role of compensatory therapy to compensate the beneficiary community or the environment for the lost service, stressing that compensatory measures do not include financial compensation here in the sense that compensatory and supplementary treatment should look for services or resources that provide the same type and level of services as the affected site or compensate the community by improving other services and resources in the region. (Fogleman, 2020) (REPORT FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Under Article 14(2) of Directive 2004/35/CE on the environmental liability with regard to the prevention and remedying of environmental damage, 2010).

3.1- Remediation Steps

There are steps that must be taken when talking about remediation. First,

3.1.1- The investigation that is intended here is to verify the impact of this pollution, directly or indirectly on people's lives or on the surrounding environment, is it possible for someone to be harmed because of this pollution? (Example in the case of water pollution, will anyone use this water for drinking, swimming, or showering?)

Is it necessary to do the treatment process?

Is the financial cost of treatment too big, in return, there no party affected by the pollution?

3.1.2- cleaning up

The second step after investigation and confirmation of the necessity of carrying out the Remediation process, the hypotheses of possible cleaning up for this pollution are evaluated on the table, the safest, most comprehensive, and appropriate method for the sensitivity of the contaminated place and appropriate to the nature of the pollution will be discussed and selected, several methods may be chosen that work together according to the environmental damage happening.

3.1.3- monitoring

During the treatment and cleaning process, the monitoring process begins, meaning the monitoring and analysis of pollution data and the effectiveness of the treatment methods that have been selected, the monitoring process continues until the completion of cleaning and in some incidents, five- or three-year plans are developed, meaning that the data in the area is re-examined, every three years to ensure that pollution does not return. (for example, in the event of water contamination, monitoring pipes are placed from which water samples are extracted and analyzed in the laboratory to assess the percentage of pollutants present in the water).

3.2- Previous Remediation Cases

3.2.1- The red Mud sludge incident in Kolontar 60 km (100 mi) southwest of Budapest in Hungary on 4 October 2010 is considered the first major case to be adjudicated under the Environmental Liability Law, the cause of the accident was negligence or error is the collapse of the reservoir containing red sludge as a by-product of the repetition of bauxite for the aluminum industry, this collapse led to a spill one million cubic meters of sludge in the form of a wave that killed ten people and injured 150 people, in addition to flooding three villages and damaging private and public properties(dr. Ágnes Gajdics, 2011).

Figure 5: The ruptured wall of a red sludge reservoir 2010, Kolontar Hungary

Source: https 5

- Environmental Damage caused

This environmental disaster caused the pollution of ground and surface waters, the pollution reached the Danube River, the largest watercourse in Hungary, on October 7th, Loss of vegetation cover and damage to crops in the lands that were exposed to the spill, which has an impact on food security, a decrease in air quality, the impact of the animal environment and the loss of a large numbers of animals such as fish and some domestic animals such as cats and dogs, as well as soil pollution.(EJOLT, 2019)

Figure 6: Greenpeace activist takes a sample of the toxic sludge 2010, Kolontar Hungary

Source: https 6

- How the Remediation was applied

This disaster was dealt with by declaring a state of emergency and evacuating the population, Hungarian authorities suspended alumina factory license in the town, a dam was built between the factory and Kolontar, in addition to the construction of additional dams, road cleaning operations were initiated by the Hungarian army and firefighters, of course, by wearing special uniforms to deal with chemicals, the government took control of the factory and a fine equivalent to 500 million euros was imposed for the cleaning work, and each was compensated an individual with 300 euros, the case was investigated and the verdict was issued in 2019 to imprisonment for the CEO of alumina company , he was sentenced to four years in prison, and the former technical director was sentenced to three years in prison.(Two recent judgments in Hungary clarify the environmental liability regime, 2020)

Figure 7: A Hungarian soldier wearing chemical protection gear 2010, Kolontar Hungary

Source: https 7

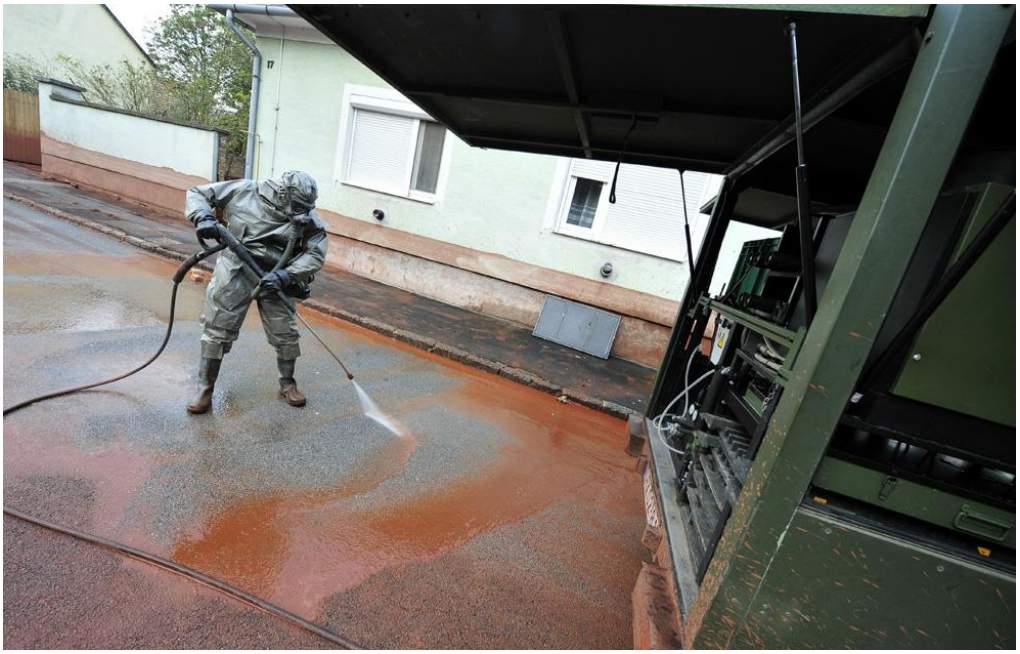

Figure 8: A Hungarian Army soldier wearing a chemical protection outfit cleans a street 2010, Kolontar Hungary

Source: https 8

Figure 9: Local residents are rescued by excavators in Devecser 2010, Kolontar Hungary

Source: https 9

3.2.2- Remediation of oil polluted site near Bugyi 42 Km south Budapest (according to a field trip)

Underground oil pipeline was broken in 1995 resulted in an enormous oil spill and unfortunately the oil reaches the ground water level, in 2004 remediation progress started in polluted area, treatment operation established contain ground water monitoring pipes and 11 wells generated by electricity to extract polluted water from the ground and turn this water into treatment system station was built in the same area.

-Treatment System Parts:

- Buffer Tank: in this tank oil will float to the surface because of density, then we can extract oil from the top easily.

-Volatile and nonvolatile component tank: for volatile containment aeration system under tank to extract volatile contamination from water (polluted air will treat).

For nonvolatile containment, active coal can do the job by adsorbing the pollutant on the top surface of the coal (polluted active coal will treat).

- Bio Filter: polluted air which was resulted from aeration will pass through bio filters made from wood and other bio components to filter and clean it before releasing it to the environment again (Bacteria studies done there).

- A ditch: treated water taken to a ditch has been drugged surround the polluted area in circle shape, the aim of keeping water in this ditch, is to push underground polluted water in the same area and to guarantee that water didn't expand to nearby areas.

3.2.3- Green Remediation at Lawrence Aviation Superfund Site in New York

The site is a titanium production and manufacturing facility 64 mile from New York where thousands of barrels accumulated and the view became very terrifying, the state of New York asked the landlord to clean the site, the action that was taken at the time was to puncture the barrels and allow them to dry, the landlord was punished and spent some time in prison and was prosecuted for paying cleaning costs.(US EPA, 2016)

The Ground water contamination was extended along the road and at a mile and a half from the site to Long Island sound, New York State summoned the Environmental Protection Agency, the treatment site was chosen based on an open area and the groundwater level is very high, it is a suitable place, the goal is to remove contaminated groundwater. (US EPA, 2016)

Unfortunately, the area around the contaminated site is a completely residential area, the Environmental Protection Agency decided to set up a superfund site in the area, therefore, before starting anything, the public must participate and put them in the picture of the current situation and inform them of the mechanisms that must be followed to clean the place, considering the aspect of their concerns and contain their fears, reassured them that this measure is to protect them and ensure their health and is in their interest first and foremost, the public and the residents of the village attended the meetings and were briefed on the architectural models and gave their opinion and answered their questions, their biggest fear was the presence of noise, two pumps and two groundwater treatment plants were built as part of the repair, the pump and the station are working to prevent any further contamination of the groundwater, a station was built inside the village of Port Jefferson, with the aim of capturing polluted groundwater, which has already reached low levels of groundwater.

Inside the building it is entirely organic from soybeans and does not contain VOCs. this material allows for a moisture and vapor barrier so that energy costs are reduced and acts as a noise reducer which has been the public's biggest concern. (US EPA, 2016)

Based on the data he collected, it was found that this site is working as it should and pollutant concentrations have been reduced, the site is located on a hill so that the site helps prevent the descent of polluted water into the village of Port Jefferson.

An agreement was reached between the residents of the village and the Environmental Protection Agency that when the facility is no longer required to operate, the place will be given to the village to be used as a recreation site, which is a bonus in the end of the game. (US EPA, 2016)

Figure 10: Entrance of the superfund site New York 2016

Source: https 10

4- Evolution of the need for Remediation over years

Since time immemorial, man has progressed and developed countries are racing in industries, which in turn need resources, these raw sources are extracted from the ground, from the seas, or from mines, which are processed for the purpose of using them as raw materials in various industries.

Any industry that needs input also necessarily generates outputs, not long ago, these outputs were not on the list of concerns and were disposed of either by burning, burying, or drowning. Unfortunately, many countries of the world are still at this stage, the goal was always profit, no one looked the downside is not that it wasn't there, no, the environment was within the limits of its ability to absorb pollutants and treat itself until the matter reached above the absorptive capacity of the environment with the increase of industries and the increase in outputs with them, then the matter became clear and problems began to explode one after another from soil pollution to water pollution to air pollution with greenhouse gases and began the world sees the fruits of what it has grown for years clearly before its eyes, the melting of snow in the poles, the clear climate change, the increase in sea water levels, the sinking of several cities, the ozone hole and many other environmental issues.

Then the protection of the environment and the need to treat it came to light, there is no guidebook that we open when there is any problem, and we follow the written steps for treatment, each case and every problem require steps and treatment techniques that are unique to it from others, each situation in the environment has a specificity that is not like the other one, there is an ideal technique for treating a specific site that is useless to treat another site, due to the nature of the place first, geography and geology, and to the nature of the activity that caused these problems, the nature of the materials used in this site and the possibility of its expansion to reach other places and many other factors.

The ultimate goal of remediation is to preserve the environment and human health and to do so in a sustainable manner.(Dr, 2019)

5- Insurance as an effective relationship between damage, liability, and operator

When environmental damage occurs and dealt with it by the local authority, the authority will request repayment of the funds paid from the operator, the costs vary to include administrative costs of collecting data and information and processing any rescue or formulation efforts made and taken to address the damage, the insurance shows as a good tool in solving environmental damages, whether they are natural disasters because of force majeure or whether they are the result of human behavior, the presence of insurance companies has benefits in three dimensions, the first of which is that the affected people because of this damage will be compensated, secondly, the company will continue its work, so the occurrence of this damage will not effect on the economic wheel, thirdly, paying the costs of damage by the insurance company protects the state, because in the absence of insurance and the inability of the harmful company to pay, the state will have to pay the costs of damage from tax money, this is what many people use as a pretext to create problems in the state and accuse it of undermining its financial security at the expense of environmental reform.(Wandt, 2020)

Liability without financial support (here, the insurance company) has no economic value, because when liability is imposed on a particular company that caused damage to the environment and this company does not have financial support to cover the expenses and costs of remediation and compensation for those affected as a result of this damage, if in this case the word "liability" has no value except the penalty value it punishes the company, prosecutes it, and puts the wrongdoers in prison.(Wandt, 2020)

Normal Situation	Threat / Damage situation
Adequate financial security to cover costs in the event of damage.	Assess environmental damage and identify the most efficient ways to contain the situation.
Periodic risk assessment.	Payment of costs and coverage of all damages after valuation of losses.
Develop sustainable insurance principles commensurate with economic activity.	Follow-up the process of remediation under the supervision of the competent authorities.

Figure 11: Insurance Duties in different situations

Source: https 11

Financial security can be obtained through bonds, letters of credit, financial reserves, self-insurance, or insurance plans, they believe in the European Parliament that every company in the European Union should be able to demonstrate its ability to respond to environmental damage. (‘ELD: Mandatory financial security and extended liability still raising concerns’, 2017)

The benefits of the insurance process are numerous: financial insurance risk assessment, risk prevention and dealing with applications. (Kivisaari *et al.*, 2022)

Where the insurance company always maintains capital that meets its needs for a year in advance that provides this financial security for the operator, the state and individuals alike as the insurance company will not withdraw from its duty under the pretext of sudden bankruptcy, where the insurance company bears its full responsibilities in advance by paying the premiums in advance and prior to any damage to avoid previous cases in the past where the operator who caused certain damage did not exist when environmental damage appeared, the difficulty of solving such situations lies in finding who bears responsibility and solving and addressing the problem, so insurance plays an important role in solving this problem through prepayment. (Kivisaari *et al.*, 2022)

Premiums are paid based on the risk assessment performed by the insurance company by experts and specialists to assess the damage and negative effects on the environment and on the individual, the risk assessment also helps the operator to detect any gap in the operation process and thus avoid future disasters. (Kivisaari *et al.*, 2022)

The insurance company then attempts to find preventive and sustainable solutions, saving a lot of money on the operator and on the insurance company in so-called risk prevention. (Kivisaari *et al.*, 2022)

The insurance company is equipped with employees and experts and is able to verify the requirements and provide them in order to protect the environment and the operator alike, the flexibility of the process is to distinguish insurance as a means of financial security from other means, especially when any damage occurs, the need for money to solve the problem is quick, the streamlining of the treatment process ensures the ease and flexibility of the insurance company. (Kivisaari *et al.*, 2022)

6-Material and Methodology

6.1- Material

In order to collect data on people's knowledge and understanding of environmental laws and environmental remediation processes for the affected areas and the responsibility of operators in remedying these damages, we prepared a questionnaire consisting of 14 diverse and comprehensive questions for a complete briefing on the subject, containing 13 option questions and one short answer question (number), and to increase access better, we made two versions of it, one in English and the other in Hungarian.

The aim of the questionnaire is to find out the public's belief and trust in environmental laws and their ability to prevent harm and solve problems; on the other hand, it is to explore the public's knowledge of the meaning of environmental restoration and remediation and the responsibility of operators in protecting the environment, the list of questions can be found in Annex 1.

6.2- Methodology

We used the Lime survey form to generate the questions and answer options, then we published the questionnaire on social media platforms (Facebook, WhatsApp, LinkedIn, Instagram) to get the largest responses from the receiving audience. After receiving the response, we analysed the data using Excel and charts to show and discuss the result.

7-Results

We reached a result of 193 completed surveys in English and 15 completed surveys in Hungarian, for a total of 208 completed surveys.

The launching period was from March until April 2023.

8- Discussion of Results

8.1- The Percentage of males and females participating in the questionnaire.

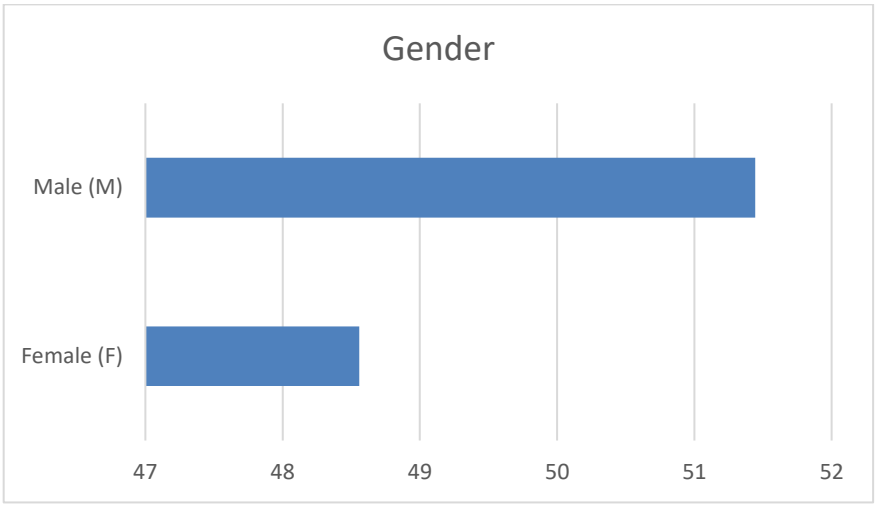

Figure12: Gender results

8.2-For the age of participant, more than half was in the range of (26 – 40).

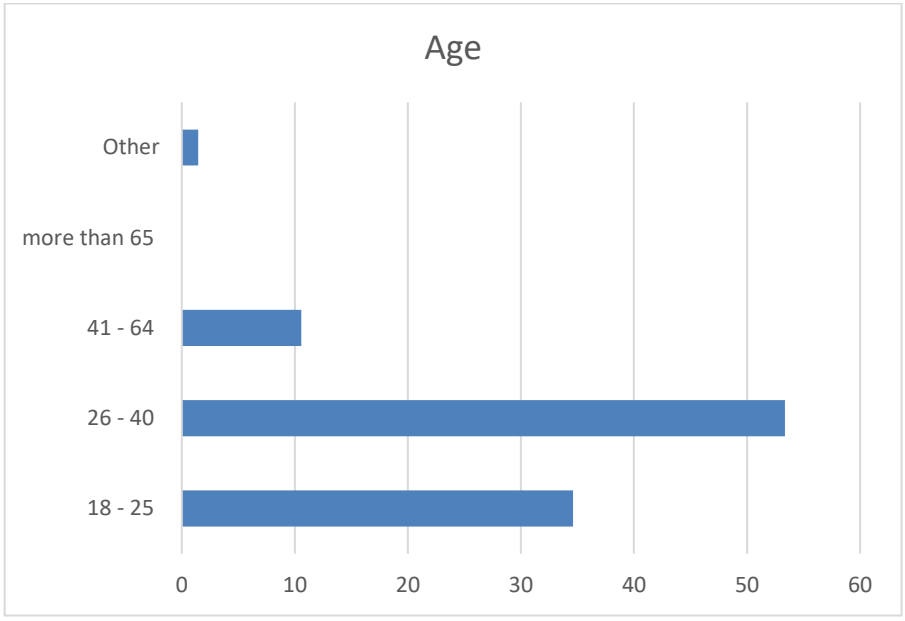

Figure 13: Age results

8.3- For Education level, we have developed educational levels from (without a high school diploma to a PhD degree), here is the results.

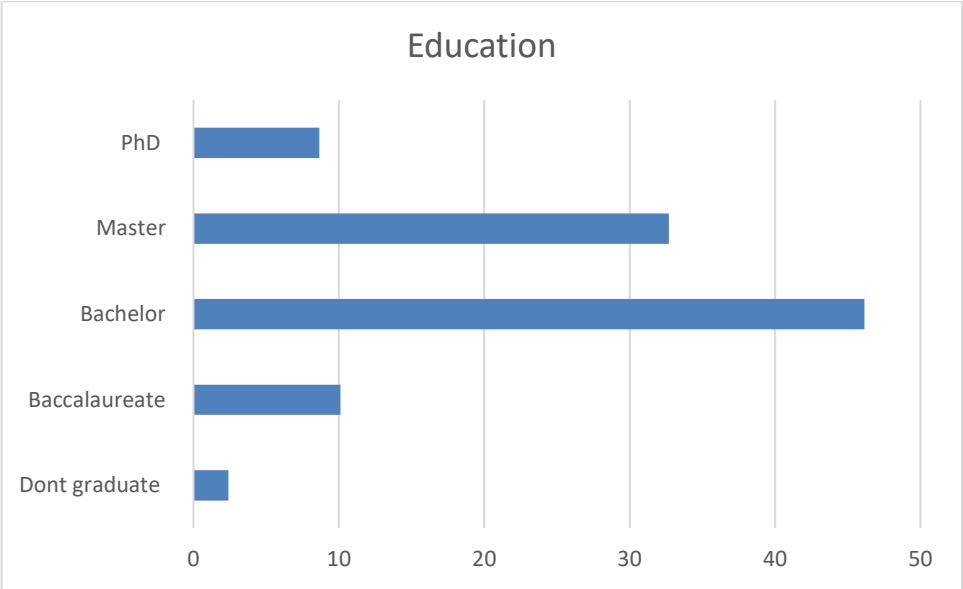

Figure 14: Education level results

8.4- For The origins of the participants, here is the result.

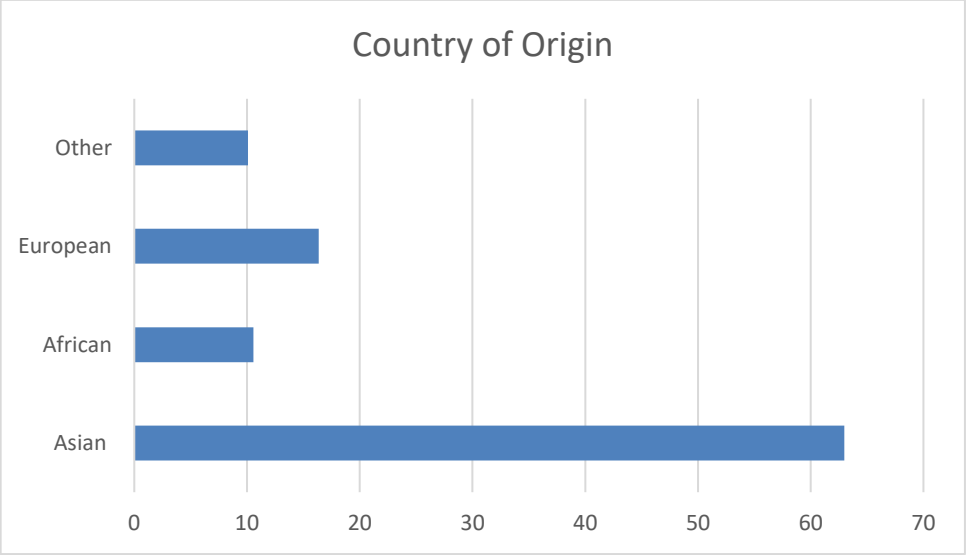

Figure 15: results of origin country

8.5- When we asked the participants about the number of environmentally damaged places in their country from their point of view or according to their knowledge, this question was confusing for the majority, as we, as citizens, have no knowledge of the number of environmentally damaged places, maybe because our country do not provide correct figures or real information about the extent of environmental damage areas in our countries, Or we do not care much about following up such information with the possibility that it is available on the environmental platforms of each country (developed countries), we can see in the tables below the average of the answers.

8-5-1-Correlation Between Level of Education and Numbers of Area needed to be restored:

There is a correlation between increasing the level of study and the ability to know or at least predict the number of places that need remediation and environmental treatment.

this is due to the fact that human, with his/her deepening in research and education, no one, can influence him/her, (the media, for example, or the authority that can hide or falsify information about the real numbers of environmental damage areas) whereas, with the increase in the level of education, a person has more experience and information through which he becomes able to know the real situation on the ground and to be acquainted with the correct numbers, the correlation coefficient is 0.40 .

Here we see that with the increase in the level of education, there is an increase in the number of places that need environmental remediation.

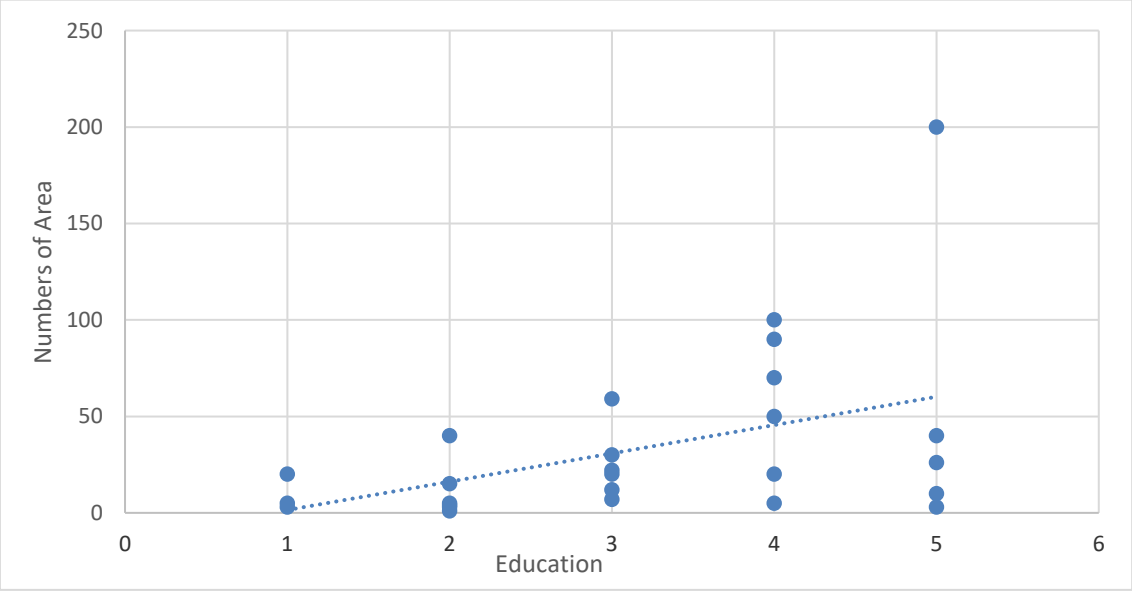

Figure 16: correlation

8.6- The meaning of restoring places or repairing them, a percentage of (40% approximately) answered that it is restoring the area to a better condition than it was,

Believing in the validity of this option is unfair in many cases, because when an activity causes damage to the region and forces to be repaired and restored to its previous state, this is considered a costly act in the first place, so how do we ask him to restore it to a better state than it was?

Many people think that exaggerating environmental laws in the means of the harshness of the provisions is a deterrent to environmental users, when the owner of any activity thinks that if he harms the area, he will have to pay more costs to develop its condition for the better, he will refrain from causing harm, but in this case it was not taken into account that many environmental damages occur due to unintended accidents.

A 01 The restoration of the state before the damage event is immediate.

A 02 Restoration to the original (old) state of the area.

A 03 Restoration to a state most appropriate for the given position.

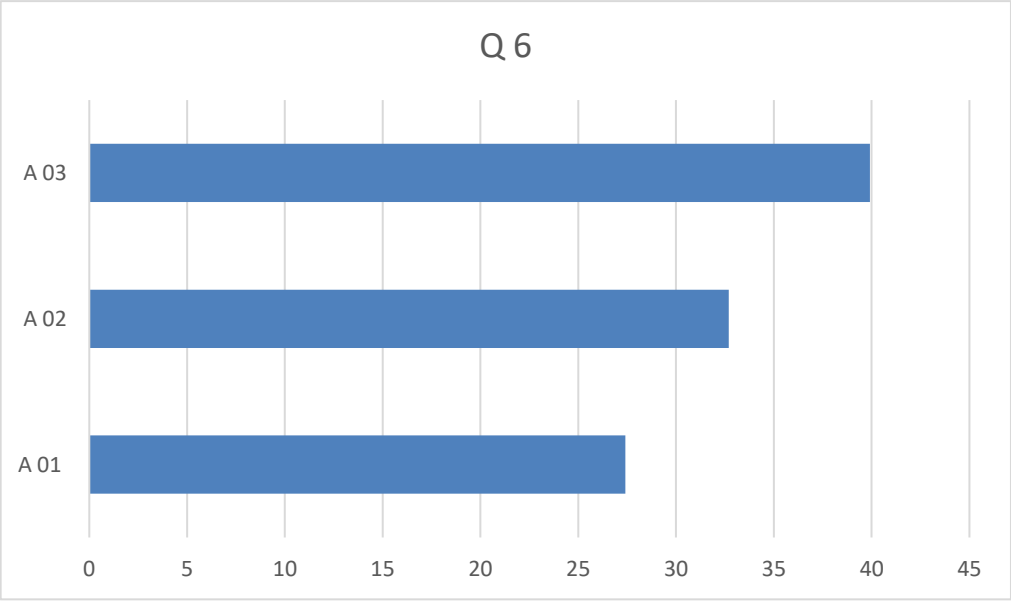

Figure 17: answers of question number 6

8.7-When asked about the most economic activities causing environmental damage, waste management and chemical industries took the lead.

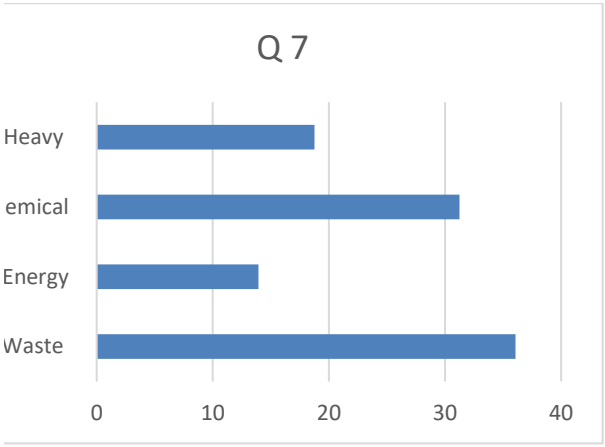

Figure 18: answers of question 7

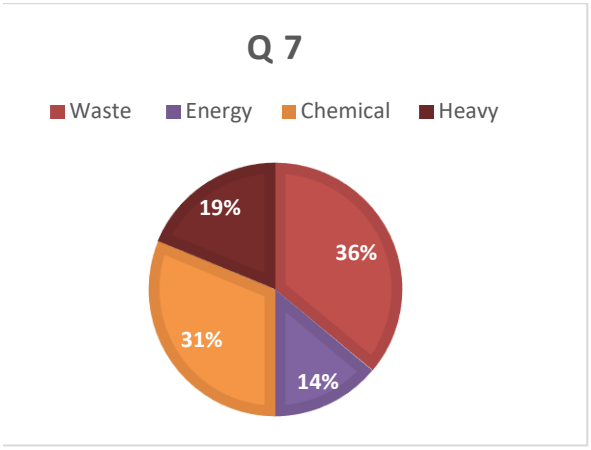

Figure 19: Pie chart of the answers percentage

8.8- The Extent to which companies in the countries of the respondents adhere to environmental laws on a scale from 1 to 5.

34% of the respondents believe that companies are closer to the middle state of compliance with environmental laws.

What is the intermediate commitment? Can a company with an industrial or economic activity that generates waste be committed medially, meaning that it commits once, and once does not comply, depending on its mood, budget, or circumstances in the country itself.

Is there a discrepancy in oversight by environmental protection institutions that require commitment at times and at other times not?

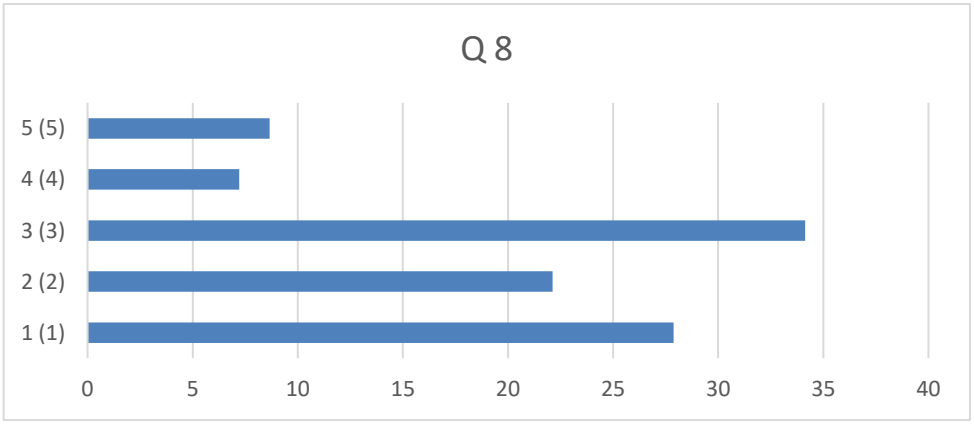

Figure 20: answers of question 8

8.9- The operator alone bears the responsibility in dealing with environmental damage resulting from an accident.

More than 60% sees that the responsibility does not necessarily fall on the operator alone, as there may be other parties involved, and this is true, as the occurrence of an environmental accident and the judgment in it is not an easy and quick issue, as all the reasons that led to its occurrence and the people that contributed to its occurrence must be researched and checked.

Environmental accidents have many dimensions (for example: place, time, number of people involved, the surrounding natural conditions, was it intentional or occurred by mistake), so the issuance of judgments in environmental accident cases is often long to ensure that all variables are taken into consideration.

But if the fault is proven on the operator, he must comply and deal with the damage and compensate for it.

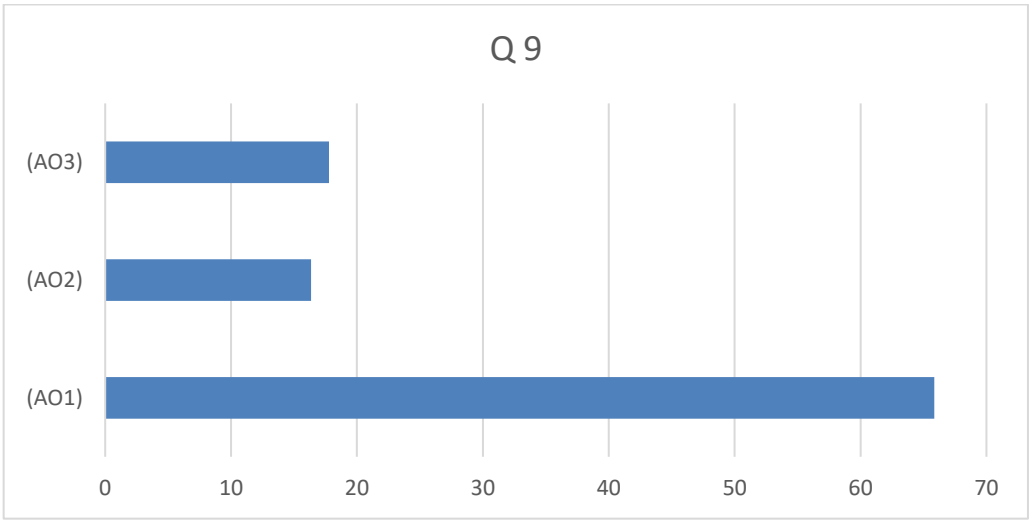

Figure 21: answers of question 9

8.10- The effectiveness of environmental regulations for protecting the environment in general, the response rates were 63.9% that the regulations need more control measures,

But are the regulations itself what need control, or the application of these regulations by companies and institutions what needs more monitoring and control measures.

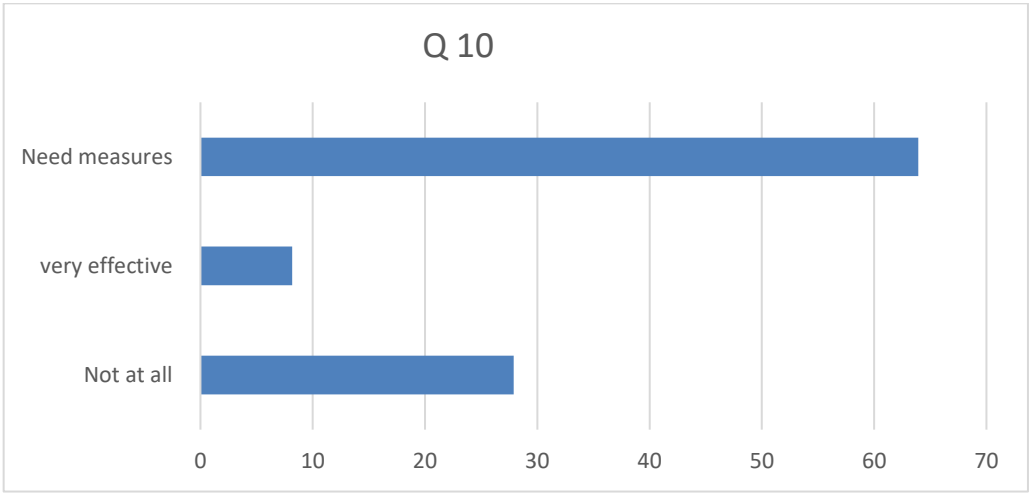

Figure 22: answers of question 10

8.11- What the countries needs to prevent environmental damage from occurring, with many possibilities (Increasing environmental awareness of the community- Imposing new fines and penalties against the offender- Encouraging and supporting green projects- Compliance with existing rules is more effective)

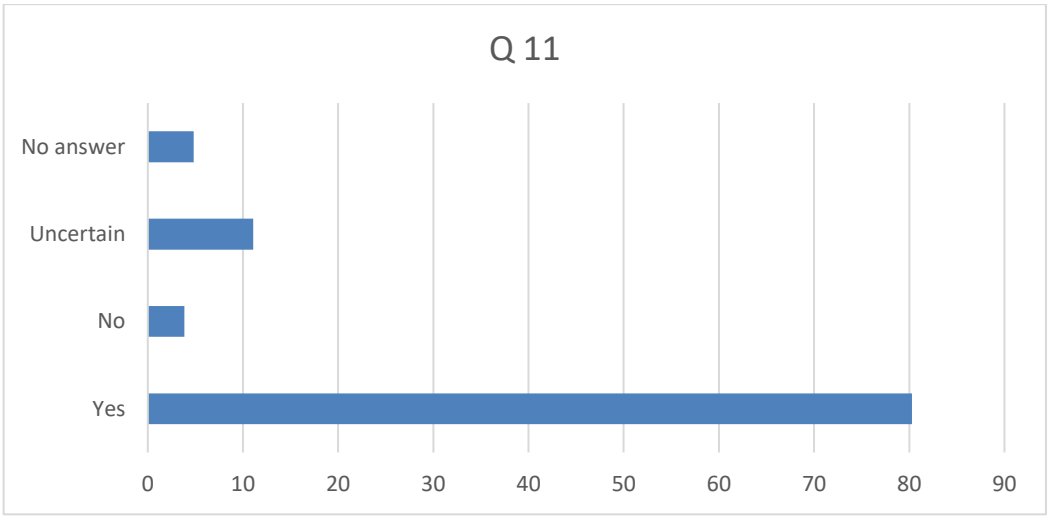

Figure 23: answers of question 11

8.12- As a question related to one of the options of the question that preceded it, we asked audience if they think that adherence to current environmental laws is sufficient to solve the environmental problems facing us.

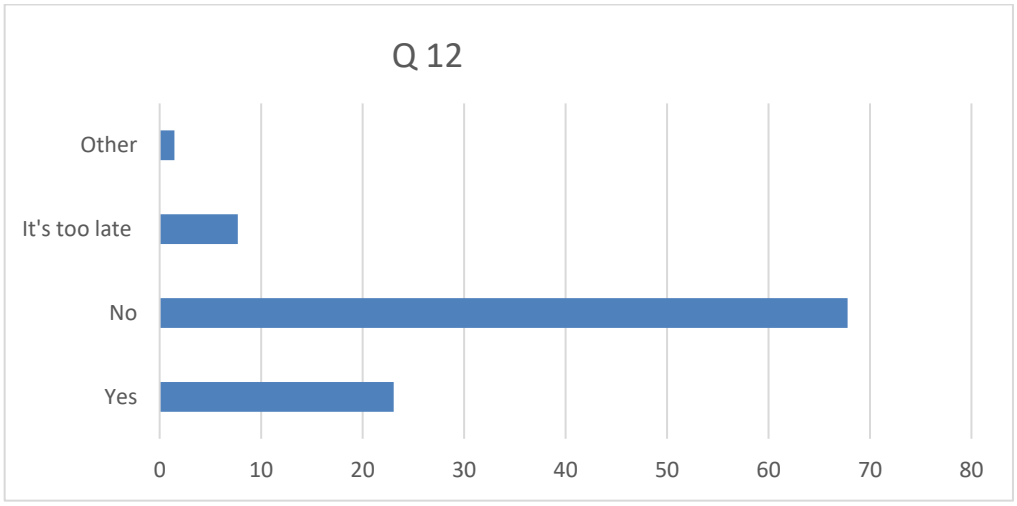

Figure 24: answers of question 12

8.13- When asked about the person or entity responsible for the liquidation of environmental damage caused by previously terminated companies, 60% believe that the Environmental Protection Authority is responsible.

This can be true to a large extent, as the successor company or the person who founded it may not exist at the present time, especially after the passage of a long period of time, and the failure to apply the environmental law to them at the time and obliging them to deal with the damage they left behind is not the responsibility of the current operator.

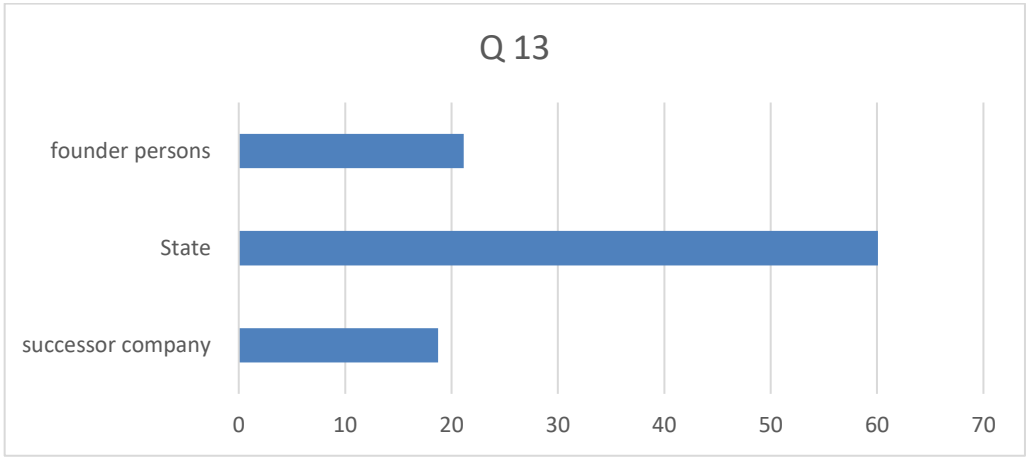

Figure 25: answers of question 13

8.14- How the environmental authority should treat environmental users with several options for answering, participant see that very swift and rigorous action should be taken, even in cooperation with other expert NGOs if there is a risk.

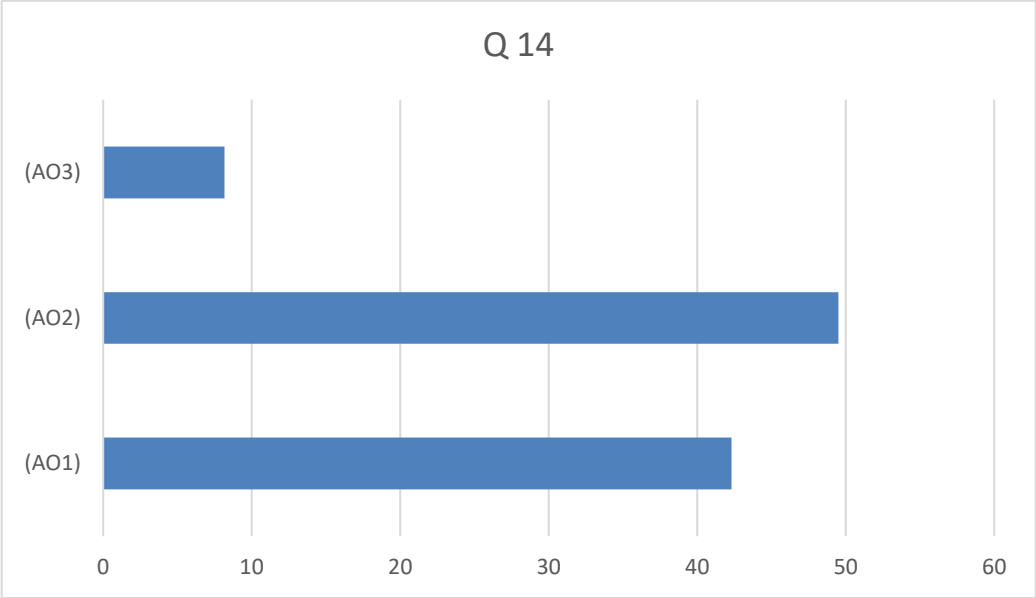

Figure 26: answers of question 14

9 -Conclusion and Recommendation

After analysing the results of the questionnaire and looking at the response mechanism of the target audience, there is a great trend to protect the environment, and this is a very good thing, but there is a great lack of environmental knowledge of the laws used, the percentage of their application, and the number of places that need environmental treatment, even if only approximate, as the question of the number of places that need treatment was faced on many of the questions.

Today, regardless of the country of origin, we need to greatly raise environmental awareness, not only regarding environmental protection and related laws and legislation, but also raising knowledge about environmental responsibility by us as ordinary people or legal persons, or if we are owners of economic interests and activities (environmental users or operators), as there is no intended benefit from raising environmental awareness of the existence of laws that protect the environment if we do not understand the correct application of these laws.

There is a lack of public confidence in the extent to which companies comply with environmental laws.

Today, we need to restore bridges of trust between the authorities and the people, where the people trust and believe that the authorities are able to follow up on the implementation of laws, monitor users and operators, not allow abuses under any circumstances, solve problems quickly and in parallel, and not allow the situation to worsen.

As an operator of an economic activity, you are considered as an environmental user who must work conscientiously, not transgress laws, and not harm the environment or the surrounding people.

Understanding the meaning of environmental responsibility as operators is very important. Knowing the limits of nature that cannot be crossed is very important, and the operator must be fully aware of them before starting his activity.

Equip factories and companies before launching them with all the necessary equipment to treat waste before releasing them into the environment and not allowing them to operate in the absence of this equipment.

Correct environmental assessment for any new project that avoids environmental disasters, carrying out periodic tours of the headquarters of dangerous economic activities, and monitoring safety and security measures and environmental treatment by the competent authorities are prerequisites for the success of collective action to protect the environment.

As normal people, of course, we are not required to delve into the depths of environmental laws and who bears the responsibilities in their details, but today, after we have reached critical environmental stages in many areas due to the lack of responsibility by all individuals, we have to increase environmental awareness through learning, research, and questioning, knowing our duties as ordinary people or as environmental users, and work collectively to survive.

10- Summary

Everyone has a responsibility to protect the environment, and in this thesis, we explore the operator's role in preventing environmental harm as they are the owner or decision-maker for economic activities.

An overview of the European Environmental Responsibility Law (ELD), German Environmental Law, and Syrian Environmental Law, the steps of the environmental remediation process using examples of environmental incidents, Since the Environmental Protection Law goes beyond simply requiring the repair of pollution or damage that has already occurred and instead goes above and beyond to prevent new damages from occurring through preventive measures that have had an effective role over time, any operator is required to implement all preventive measures prior to starting the operation of the facility.

The activation and duty of the environmental responsibility to operators and the treatment of the impacted areas, if they exist, are directly related.

We created a questionnaire with 14 varied and thorough questions for a thorough briefing on the subject, and to better increase access, we made two versions of it, one in English and one in Hungarian.

The questionnaire was created to gather data on people's knowledge and understanding of environmental laws, environmental remediation processes for the affected areas, and the responsibility of operators in remedying these damages.

The purpose of the survey is to ascertain public perceptions of environmental laws' effectiveness in preventing harm and resolving issues, as well as public understanding of the terms "environmental restoration and remediation" and "operators' responsibility."

There is a strong trend toward environmental protection, which is excellent, but there is a severe lack of environmental knowledge regarding the laws that are in place, the extent to which they are applied, and the number of locations that require environmental treatment, even if only roughly.

More than half of the respondents believe that other parties may be at fault in addition to the operator, and this is accurate given that it takes time and research to determine all of the factors

that contributed to an environmental accident's occurrence as well as the people who were responsible for it.

The issuance of judgments in environmental accident cases is frequently delayed ensuring that all relevant factors are taken into account. However, if the operator is found to be at fault, he is required to take responsibility for the harm and make up for it.

Today, regardless of where we are from, we must dramatically increase environmental awareness, not only in terms of environmental preservation and the rules and regulations that surround it but also in terms of our own environmental responsibilities as regular people, legal persons, or individuals.

There is only one way to survive—a group of efforts that everyone, regardless of occupation or age, must make. This is because saving the planet and feeling responsible enough to prevent further harm are in the interests of humans first and foremost; it is a human, moral, and legal value in the sense of the obligation to carry out a certain duty towards a person, society, or the environment.

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Annex 1:

1-Gender:

- Female
- Male

2-Age:

- 18 - 25
- 26 - 40
- 41 - 64
- more than 65
- Other:

3- Education:

- Do not graduate from high school
- Baccalaureate - High School Diploma
- Bachelor degree - College Degree
- Master degree / Undivided Degree - University Degree
- PhD degree

4- Country of origin:

- Asian country
- African country
- European country
- other

5- According to your knowledge, how many areas in your country need to be restored or compensated?

…….

6-In your opinion, the restoration of the environmentally damaged area includes the following means:

- The restoration of the state before the damage event is immediate
- Restoration to the original (old) state of the area
- Restoration to a state most appropriate for the given position

7-In your opinion, which of the following types of economic activity is the most responsible for causing environmental damage?

- Waste management
- Energy production
- Chemical /petroleum industries
- Heavy industries

8-Please classify according to the scale below how well the companies (in your country in general) comply with environmental regulation during their activities? (1 Not committed / 5 very committed)

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

9-In the event of an accident affecting the environment caused by a given, nameable economic or industrial activity, do you think that the operator (performer of the activity) should be held fully responsible by law?

- Partly yes, as someone else may have contributed to the accident
- Yes, just the operator
- I don’t know

10-How effective do you think the current environmental protection rules are in general (in your country)?

- Not at all
- very effective
- Need more control measures

11-What do you need in your country to prevent environmental damage?

	Yes	Uncertain	No	No answer
Increasing environmental awareness of the community (education)	Yes	Uncertain	No	No answer
Imposing new fines and penalties against the offender	Yes	Uncertain	No	No answer
Encouraging and supporting green projects	Yes	Uncertain	No	No answer
Compliance with existing rules is more effective				

12-Do you think that more compliance with environmental laws alone can solve our environmental problems?

- Yes, literally when applied
- No, because protection of the environment requires the joint effort of the community and society
- It's too late to save the environment now
- Other

13-In your opinion, who is legally responsible for remedying the environmental damage left behind by previously liquidated or deregistered public or private companies?

- successor company
- State (environmental authority)
- founder or founder persons

14-How do you think the state/environmental authority should treat environmental users?

- In the case of an activity that is potentially dangerous for the environment, it should require a substantial deposit from the company, which, if no damage is caused, can be returned after the activity is completed.
- If there is a risk or threat of damage, very swift and rigorous action should be taken, even in cooperation with other expert NGOs.
- Action should be taken only in the event of specific damage, and then as strictly as possible.

Annex 2:

sets out 14 types of activities:

1. activities permitted by the Industrial Emissions Directive;
2. waste management operations, including the operation of landfills;
3. discharges of specified dangerous substances into inland surface water that require prior authorization;
4. discharges of specified dangerous substances into groundwater that require prior authorization;
5. discharges of pollutants into surface water and groundwater that require prior authorization;
6. water abstraction and impoundment;
7. manufacture, use, storage, processing, filling, release into the environment and onsite transport of dangerous substances, dangerous preparations, pesticides and other plant protection products and biocidal products;
8. transport of dangerous or polluting goods by road, rail, inland waterways, sea or air;
9. operation of installations authorized under air pollution legislation;
10. contained use, including transport, of genetically modified organisms (GMOs);
11. deliberate release into the environment, marketing and placing on the market of GMOs;
12. transboundary shipments of waste;
13. extractive waste management; and
14. the operation of storage sites for carbon dioxide.

DECLARATION

on authenticity and public assess of master's thesis

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Title of the document:	Responsibility of Operator to Remedy and Repair Environmental Damage
Year of publication:	2023
Department:	Environmental Engineering

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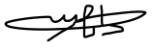

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