

The impact of eu legislation, principles and case law on the national contaminated land regimes

Parte I

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1. Introduction

Contaminated Land Regimes (CLRs) cover one of the few areas of environmental law where **detailed legislation is not in place at the EU level**. Important policy decisions are thus left to the discretion of the Member States. Arguably, the most important of these decisions concerns the allocation of the burden and costs of remediation.

The main research question this study aims to address is **whether and to what extent national CLRs are receptive to several early and recent developments in the EU legislation and case law**. In particular, we intend to focus on the (likely) effect on the national CLRs of:

1. the implementation of the Baseline Report obligation under the recent Industrial Emissions Directive 2010/75/EU (IED)

and

2. the recent European Court of Justice (ECJ) case law on the Environmental Liability Directive 2004/35/EC (ELD).

To answer this question, we have conducted a comparative analysis of the relevant legal framework in four EU countries where the presence of contaminated land is a major policy problem. The research consists of **three main parts**.

The **first part** (Chapter 2 and Chapter 3) focuses on the legislation of some European countries (UK, Italy, Spain and France) and on the relevant environmental principles adopted by the European Union. In particular, Chapter 2 has been devoted to studying the CLRs of four European countries: the UK, Italy, Spain and France. These countries have been chosen because of their industrial history, the existence of large contaminated areas on their territories and the possibility, for the researcher, to read legal sources in their original language. How the CLRs identify the liable party is the main aspect we have analysed. The cost allocation in cases of multiple party causation and what happens when nobody voluntarily implements the remediation are two further problems which are particularly relevant to this research. Chapter 3 reviews, the relevant EU principles, namely the polluter-pays principle, the stewardship principle, the precautionary principle, and the principle of environmental harm.

The **second part** (Chapter 4 and Chapter 5) investigates the influence of EU legislation and case law on the national CLRs. Chapter 4 examines whether and how early EU legislation and case law has affected national CLRs. We have focused attention, in particular, on the ELD (Environmental Liability Directive), the WFD (Waste Framework Directive), and the ECJ (European Court of Justice) decision of 9 March 2010, analysing whether their tendency to refer to the polluter-pays principle only was mirrored in the national CLRs. Chapter 5 analyses the influence of recent developments in EU legislation and case law on the CLRs. In particular, it investigates in detail how the Baseline Report obligation established by the IED is being implemented by the Member States.

According to the IED, an increase in the pollution level triggers the obligation to return the site at least to the state described in the Baseline Report. However, the features of the remediation obligation as a whole are not defined by the IED, but rather left to the discretion of the Member States. What is peculiar here is that the Baseline Report will interfere with the CLRs by requiring the enactment of an administrative procedure uniform at European level. This stage of my research examines whether national legislation and guidelines implementing the Baseline Report obligation explicitly take into account their links with the national CLRs. To this end, it reviews the European Commission Guidance concerning baseline reports, and compares it to the national guidelines of the four chosen Member States. In addition, this chapter includes a discussion of the recent ECJ decision of 4 March 2015, as in this decision the ECJ modified its previously very rigid interpretation of the polluter-pays principle.

The **third and conclusive part** (Chapter 6) presents the output of the comparative analysis, discusses the tendency towards the approximation of the national CLRs and presents some policy considerations related to the advantages of a common EU Contaminated Land Regime) CLR and of a shared - though possibly 'vague' - Contaminated Land Language (CLL?).

Studying the CLRs does imply some terminological issues . The two most important ones are related to the use of the word 'contamination' (instead of 'pollution') and of the word 'land' (instead of 'site')[1]. 'Contamination' is properly used, as it covers the state of both soil and groundwater. we would personally prefer to use the word 'site' instead of the word 'land', as it is more evident that the former also embraces groundwater, which is very often the most problematic target of any remediation activities. However, the expression 'Contaminated Land Regime' is now commonly accepted, on the assumption that here land also refers to some bodies of water, according to the different national regulations.

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PART 1: CLRs LEGISLATION AND RELEVANT PRINCIPLES

2. The Contaminated Land Regimes (CLRs) in the EU Member States

I. Definition of CLR

For the purposes of this study, a country's Contaminated Land Regime (CLR) can be defined as **the national regulation applicable to the land, subsoil and/or groundwater polluted by substances that can cause significant harm to the health of the environment or of organisms living therein.** Such regulation usually entails a set of rules aimed at deciding whether the mentioned pollution or significant harm are in place or can reasonably be expected. These legal regimes also define how the remediation targets should be identified, who should pay for the clean-up, and which administrative procedures and monitoring should occur for these purposes.

Comparing legal cultures in environmental law presents specific issues. One of the most difficult ones derives from the large number of complicated technical aspects involved in any environmental regulation^[2]. Within the contaminated land regimes, such issues are mainly related to the different techniques which are available for remediating both soil and groundwater. Each of such techniques presents different advantages and disadvantages as to their costs, performances, and administrative procedures that are necessary for the implementation process.

II. The lack of explicit European regulation on the CLRs

CLR is one of the few areas of environmental law where detailed legislation is not in place at the EU level^[3]. Furthermore, to date there has been “very little international dialogue on site contamination as a specific issue meriting concerted international action”^[4]. This might be partially explained with the high variability in soil types across different countries; however, lack of public awareness is probably the most important factor, due to the gradual and largely invisible occurring of the contamination.

Important policy decisions are thus left to the discretion of the Member States, such as decisions on: i) the allocation of the burden and the costs of the remediation; ii) the standard of evidence to be applied in order to identify the responsible party; iii) the definition of the remediation targets; iv) how to handle contaminated areas where nobody voluntarily takes up the responsibility for the remediation.

Arguably, **the most important of these decisions concerns the allocation of the burden and costs of the remediation.** Several CLRs fluctuate between fully adhering to the polluter-pays principle on the one hand, and mitigating it through the stewardship principle on the other. The polluter-pays principle establishes that the polluter only should pay for the remediation. Consequently, if the polluter is not found or is not in the condition to pay, either the remediation is funded by taxpayers or it does not take place. On the contrary, according to the stewardship principle, the landowners – even when they are not responsible for the contamination – should pay for at least part of the remediation.

Despite the lack of a general European framework on contaminated land law, **EU environmental law and ECJ case law regulate and address matters that are relevant for the drafting, interpretation and implementation of the national CLRs.** At least three parts of the EU law must be mentioned to that aim and will therefore be analysed in this article:

- The IED (Directive 2010/75/EU), when it introduces the Baseline Report;
- Some EU environmental and general principles;
- Some EU case law on the ELD (Directive 2004/35/EC).

III. CLRs in four European countries

The legal doctrine^[5] has identified **five models of liability for remediating contaminated land:**

“Model 1: The polluter should pay and no one else should pay. If the polluter cannot be found, there will be no liability for remediation.

Model 2: As a priority, the polluter should pay, but where the polluter is not found, it may be possible for residual liability to rest elsewhere on, for example, owners or occupiers of land or the state.

Model 3: As a priority, the right sort of polluter should pay, but if the polluter does not meet those criteria ..., then others may also be liable. Causation is not the only test for being a polluter.

Model 4: Liability is based primarily on fault, not causation.

Model 5: The polluter may be liable, but so equally may others be, regardless of fault.”

Denmark is mentioned as the main example of Model 1, The UK of Model 2, The Walloon Region of Model 3, The Netherlands of Model 4 and Germany of Model 5. However, as each country has developed its legislation autonomously, there may be uncertainties as to which model exactly one or the other country may be referred to.

In the following paragraphs, the CLRs of four countries – namely, the UK, Italy, France, and Spain – will be briefly described, with main reference to the problem of the allocation of costs: who is (or who are) the appropriate person(s), to be made liable for the remediation’s costs?^[6] This makes the description of the UK CLR longer than the other descriptions, as the UK regimes goes in great detail on that topic. Two further problems will be briefly addressed, for each country, as they are related to the main issue (allocation of costs):

1. The cost allocation in cases of **multiple party causation**;
2. The criteria for dealing with contaminated areas where **nobody voluntarily takes on the responsibility for the remediation.**

A. CLR in the UK

With regard to the allocation of costs, the UK CLR falls mainly under the description of Model 2 (“*As a priority, the polluter should pay, but where the polluter is not found, it may be possible for residual liability to rest elsewhere on, for example, owners or occupiers of land or the state.*”). Furthermore:

1. In cases of **multiple party causation** costs are allocated by the remediation notice taking into account the **share of costs that each appropriate person is respectively liable to bear**. To this end, liabilities must be normally determined with reference to each contaminant linkage, although this is far from being always easy.

2. When **nobody voluntarily takes on the responsibility for the remediation**, the **enforcing authority** can carry out at its own cost some remediation actions and is then entitled to **recover the reasonable cost from any appropriate persons**, taken however into account any reasonable hardship which might occur from the recovery.

The contaminated land regime in the UK is regulated by **Part 2A of the Environmental Protection Act 1990 (EPA 1990)**. Part 2A was introduced into the Environmental Protection Act in 1995 and entered into force only in 2000^[7]. The regime is based, in accordance with the ELD (Environmental Liability Directive), on the principle that polluters should pay. In practice, the regime places a statutory duty on local authorities to assess which land is contaminated^[8] and to ensure that the land is remediated^[9].

Some aspects of the regime are left to be determined by a statutory guidance issued by DEFRA (Department for Environment, Food and Rural Affairs)^[10]. The guidance is intended to explain how local authorities should implement the regime, including how they should decide whether the land is contaminated and the process of recovering the costs of the remediation from the liable parties^[11].

The first guidance was adopted in 2000 and later amended in 2006 and 2012^[12]. The new guidance, adopted in 2012, tries to address some critical aspects that emerged during the application of the regime^[13]. In order to make the regime more effective, some “new” principles have been introduced, such as the presumption against designation of land as contaminated land, the idea that the cost recovery from the polluter can also be a partial recovery as well as the fact that the contaminated land regime should be a regime of last resort^[14]. An important aspect of the contaminated land regime, that is especially relevant in the risk assessment process, is **uncertainty**.

The Guidance indicates a number of factors to be taken into account in order to maintain a balanced approach when facing “*unavoidable uncertainties*”^[15]. Notably, one of these factors is the comparison between costs and benefits. This provision is in line with the idea that the local authorities should ensure that any regulatory intervention is likely to produce net benefits before they designate a land as contaminated land^[16]. To sum up, the regime aims to tackle certain specific situations of contamination. The focus is on the protection of human health (and other relevant receptors). The determination of a land as contaminated land should always follow a detailed process of risk assessment, which must be based on solid scientific knowledge.

Determining which clean-up steps are to be taken depends on whether the owner or some other appropriate person decides to voluntarily remediate the land or whether the enforcing authority serves a remediation notice on the appropriate person [17]. The standards of the remediation must be “reasonable”. What a “reasonable” remediation would require has to be determined taking into account both the cost of the remediation and the seriousness of the pollution or harm.

Once a land has been determined as contaminated land, the enforcing authority must consider how it should be remediated[18]. The instrument that can be used is the “*remediation notice*”. The remediation notice is served to each person who is an appropriate person (see above for further details on this), and specifies what they are required to do.

As to the identification of the appropriate person(s) who should pay for the remediation, Part 2A distinguishes between **two different groups of appropriate persons: Class A and Class B persons**. Class A persons are those who caused or knowingly permitted the contaminating substance to be on or under the land[19]; Class B are the current owners and occupiers of the land[20]. A knowing permitter can be defined as a person who knows that the contamination is present at a site, has the power to remediate it, but fails to do so after a reasonable opportunity[21].

Class B persons may be deemed liable only if no Class A person has been found, after a reasonable inquiry [22]. A “liability group” is composed by all those persons who would be appropriate persons to pay for remediation actions relevant to the contaminant which forms part of a certain contaminant linkage. The procedure for determining liabilities (explained by the Guidance in section 7) can be more or less complex, depending on the history of the site, the number of contaminant linkages, the number of different owners, and so on.

It may happen that no Class A or Class B person can be found or that those who would be liable are exempted by one of the relevant statutory provision (or that the significant contamination linkage relates solely to the significant pollution of controlled waters - and not to significant harm - and no Class A person can be found)[23]. In these cases, the contaminant linkage is called an “*orphan linkage*”. The main issues as regards **orphan linkages** is who should bear the remediation cost. There are two possible situations. Where the remediation actions referable to the orphan linkages are also referable to other contaminations links (shared actions), for which a liability group has been identified, the liability group will bear the remediation costs. In other cases, the costs of remediation actions referable to the orphan linkage are borne entirely by the enforcing authority[24].

Remediation actions can be “*single-linkage action*”[25] or a “*shared action*” [26]. These distinctions are relevant in order to establish how to share the cost of each action among the different persons and liability groups.

As a general rule, if there is a Class A liability group (or more), that group will bear the cost, and no cost should be attributed to Class B persons. Special rules on the apportioning of liabilities among different class A groups apply. Each group is liable for the remediation actions referable to the contaminant linkage for which the group has been identified, but, in the presence of shared actions, responsibilities will be apportioned according to the specific principles[27].

There are six different exclusion tests as regards class A persons [28] and one exclusion test as regards class B persons[29]. According to the Guidance, the exclusion tests “*are intended to establish whether, in relation to other members of the liability group, it is fair that relevant persons should bear any part of that responsibility*”[30]. However, it has been argued that the main purpose of the exclusion tests is to transfer the liability of the actual polluter to persons who purchased land that had been contaminated before they acquired it[31].

After the application of the exclusion tests, the enforcing authority appoints responsibilities among the members of each Class A liability group. The general principle governing apportionment of responsibilities is that liability should “*reflect the relevant responsibility of each of those members for creating or continuing the risk now being caused by the significant contaminant linkage in question*”[32]. The application of such a principle poses many different challenges, given that the history of a site, the number of people and the kind of activities that subsequently have taken place on the land are likely to vary greatly. As regards Class B persons, the enforcing authority should apportion liability in proportion to the capital values of the interests in the land in question[33].

In some cases,[34] the enforcing authority has the power to undertake the remediation actions, or some of them, autonomously. In fact, under Part IIA of the Environmental Protection Act 1990 local authorities have a statutory duty to undertake inspections of their areas and to identify sites which could present a significant risk to human health or the environment and, where appropriate, to enforce remediation of such land[35]. Section 78P specifies that in deciding whether to recover the cost the authority shall have regard to any hardship which the recovery may cause to the person from whom the cost is recoverable and to any guidance issued by the Secretary of State.

As regards the concept of **hardship**, the 2006 Circular defined it as “*hardness of fate or circumstances, severe suffering or privation*”[36]. The 2012 Statutory Guidance specifies that “*the authority should waive or reduce the recovery of costs to the extent that it considers this appropriate and reasonable [...] to avoid any undue hardship which the recovery may cause to the appropriate person*”[37]. This is one of the most discussed provisions of the Statutory Guidance. The hardship criterion, in fact, gives rise to a number of issues when it comes to its concrete application. Indeed, local authorities tend to consider that hardship will always be caused where the appropriate person is a Class B person, especially homeowners. It has been argued that the difficulties in the application of the hardship test are related to the predominance that enforcing authorities give to the polluter pays principle: “*The reliance on the prevalence of the polluter pays principle in the regime has caused an assumption that, because it is necessarily fair that a polluter pays to clean up harm caused by their actions, it is necessarily unfair to make an individual pay to clean up harm which was not caused by his or her actions*” [38].

The principle of stewardship[39] could be used in order to justify the recovery of the costs from Class B persons. Stewardship can be defined as the responsibility for environmental quality shared by all those whose actions may affect the environment[40]. In other words, the principle should guide the behaviour of those acting as “steward” (in this case the owner of a property). Since the owner or occupier of a land has the power to make decisions about the land, he/she carries some obligations[41]. Additionally, the owner of the land gains advantage from the remediation of the land, such as, first of all, the increased monetary value of the land.

As regards other principles that should inform authorities’ decisions on cost recovery, according to section 8.5 of the Guidance: “*a) the authority should aim for an overall result which is fair and equitable as possible to all who have meet the costs of remediation, including national and local taxpayers; b) the “polluter pays” principle should be applied with the view that, where possible, the costs of remediation should be borne by the polluter. The authority should therefore consider the degree and nature of the responsibility of the relevant appropriate person(s) for the creation, or continued existence, of the circumstances which lead to the land in question being identified as contaminated land*[42]”.

CLR in Italy

With regard to the allocation of costs, the Italian CLR positions itself somewhere **in the middle between the description of Model 2** (“*As a priority, the polluter should pay, but where the polluter is not found, it may be possible for residual liability to rest elsewhere on, for example, owners or occupiers of land or the state.*”) **and the description of Model 5** (“*The polluter may be liable, but so equally may others be, regardless of fault.*”). Furthermore:

- 1) In cases of **multiple party causation** costs are now allocated following the **proportionate liability rule** (“*responsabilità proporzionale*”), not the joint and several liability rule (“*responsabilità solidale*”) ;
- 2) When **nobody voluntarily takes on the responsibility for the remediation**, the **responsible parties bear the obligation to reimburse the costs** of the measures, if any, implemented by the public authorities. The Legislative Decree n. 152/2006, as amended (several times) between 2006 and 2017, contains the relevant regulation[43].

As a general rule, under the **polluter-pays principle** the obligation to remediate or to secure contaminated land is imposed on the polluter only, not on the innocent owner or manager of the land[44]. **However, the owner or manager of the site** - who is not responsible for the pollution - must take **part of the burden**, shouldering the following three obligations:

- a) Carrying out any urgent **preventive measures** that could avoid further extension of the existing pollution;
- b) **Reimbursing** the costs related to the remediation and/or emergency measures, if any, undertaken by the competent authority, but only within the limit of the market value of the site;
- c) **Carrying out the entire remediation (when the innocent owner or manager themselves have promised to do so).**

The first obligation (Carrying out urgent **preventive measures**) is **applicable even when the polluter has been identified or is being identified, and whatever the financial situation of the polluter themselves** (art. 245 of the Legislative Decree n. 152/2006).

The second obligation (**Reimbursing**, to some extent, the costs related to the remediation and/or emergency measures undertaken by the competent authority) is **the most innovative and significant exception to the polluter-pays principle introduced by the Italian CLR** (art. 253 of the Legislative Decree n. 152/2006).

The third obligation (**Carrying out the entire remediation when the innocent owner or manager have promised to do so**) was recently addressed by an Italian court case. The innocent owner had undertaken to remediate their land and groundwater, within the context of a comprehensive agreement with the public authorities. After realizing the high cost of the remediation, the owner changed their mind. The Court decided that no U-turn is acceptable in such a case[45].

The situation described above shows why the Italian regime can be placed somewhere in the middle between Model 2 and Model 5. It is close to Model 2 to the extent that, as a priority and a general rule, the polluter should pay. However, it presents aspects of Model 5 also, as:

1. for the emergency obligation of the owner or manager of the site to come into existence, it is not necessary that the polluter has not been found;
2. in any case, the innocent owner must reimburse, to some extent (within the limit of the land's value), the costs related to the remediation and/or emergency measures undertaken by the competent authority when no polluter, available to remediate or in the condition to do so, has been found.



Apart from that, in Italy the main issue that in practice comes under scrutiny lays in the identification of the party (physical or legal person) that is responsible for the pollution[46]. As mentioned above, it is this party that, as a general rule, has the legal duty to plan and implement the whole remediation. And it is this party that – in case of non-compliance – faces all the relevant consequences, including a possible conviction for the crime of “Failure to Remediate”. Frequently, there are several concurrent responsible parties.

In this cases, the main legal problem is whether a proportionate liability regime or a joint and several liability regime is in place. In other words, the most relevant question is: can the authorities order that the whole remediation be carried out by one of the responsible parties only? In the past, most of the Courts’ decisions were in favour of a joint and several liability regime. More recently, however, an important decision from the Italian Highest Administrative Court[47] has sustained that, taking into account all the relevant regulations and principles, the contaminated land regime is governed by the rule of proportionate liability. Following this decision, other judgments applied the joint and several liability regime (TAR Brescia sez. II, 09/08/2018 n. 802). Thus, under this rule, each responsible party should be liable only for their share of responsibility.

With regard to the **targets of the remediation**, Title V, Section 4 of the Italian Environmental Code (Legislative Decree n. 152/06) contains specific contamination thresholds. The infringement of these limits triggers the obligation to carry out further steps, the first one being the identification of the remediation targets through a site-specific risk analysis.

The Italian **CLR** described above is part of the Italian **public law**. It regulates the relationship between the authorities, the owner or manager of a contaminated site and the party that is responsible for the contamination. However, such a public law regime indirectly affects also the **private law** regulation of the relationship between sellers and buyers of any contaminated area. Particularly when the sale takes place before the remediation be carried out, serious and sometimes unexpected problems can arise because of the possible interference between public law and private law.

On the one hand, the seller might accept a reduced price from a buyer that is willing to assume the contractual obligation to implement the remediation. However if for any reason, the buyer does not carry out the remediation, and if the seller is also the party that is responsible for the original contamination, the authorities, under the Italian public law, can put the burden to remediate on the seller's shoulders. This means that the seller risks paying the cost of the clean-up twice: the first time by agreeing on a reduced sale price, the second time by bearing the economic burden of the actual remediation.

On the other hand, the buyer too can face unexpected risks. This can happen when this party pays the full price with the agreement that the remediation be carried out by the seller immediately after the sale. If, for any reason, the seller does not carry out the remediation **the seller does not carry out the remediation**, the authorities, under the Italian public law, can directly implement the remediation, asking the buyer to reimburse the related costs, within the limit of the market value of the site.

In both cases, **unexpected costs can remain hidden for a long time behind any sale of a contaminated area**. Only by anticipating the evaluation and handling of such a risk, can the parties reach a balanced and reciprocally reliable agreement. This precaution is even more important when what is being transferred is not the **ownership of a piece of land**, but **the majority of shares of a corporation owning the land**.

Finally, the polluter's obligation to remediate does not suffer exceptions for historical contaminations, older than thirty years^[48] (thirty years is the limit chosen by the ELD for the obligation to restore environmental damage in general).

CLR in France

With regard to the allocation of costs, the French CLR falls under the description of Model 2 (“*As a priority, the polluter should pay, but where the polluter is not found, it may be possible for residual liability to rest elsewhere on, for example, owners or occupiers of land or the state.*”). Furthermore:

- 1) In cases of **multiple party causation costs are allocated following a rule of proportionate liability (art L 162-18 of the Environmental Code)**^[49];
- 2) When **nobody voluntarily takes on the responsibility for the remediation, the responsible parties bear the obligation to reimburse the costs of the measures, if any, implemented by the public authorities**^[50].

The Circulaire ministérielle du 19 avril 2017^[51], contains the French CLR. The methods currently in use are described in the *interprétation de l'état de milieux (IEM)* and the *plan de gestion*. The matter is still regulated within the legislation on *Installations classées pour la protection de l'environnement (ICPE)*. Environmental protection and health is primarily pursued through risk prevention^[52].

As a general rule, under the polluter-pays principle, the obligation to remediate or to secure contaminated land is not imposed on the innocent owner or manager of the land. The exceptions to the application of the polluter-pays principle are very limited. If the *exploitant* is insolvent and therefore will not be able to give effect to obligations under the Environmental Code, in exceptional circumstances the State can act through ADEME (*Agence de l'Environnement et de la Maîtrise de l'Energie*).

The *Circulaire du 26.0511 relative à la cessation d'activité d'une installation classée - chaîne de responsabilités - défaillance des responsables* (BO du MEDDTL n° 2011/14 du 10 août 2011) establishes that "*une seule limitation du champ de l'action publique et le maintien d'un caractère exceptionnel particulièrement à l'intervention de l'ADEME [...] permettent de garantir que le système ne soit pas perçu comme un droit par le responsable here we assume voudraient pas leurs obligations de remise en état*". Any intervention of the public authorities is however aimed mainly at securing the safety of the site, in case of actual danger to people or the environment. **The owner of the contaminated soil cannot be held responsible, unless it is proven their negligence or involvement in the contamination.**

More generally, the contamination of a site represents a risk only if the pollution sources are susceptible to propagation and can cause a damage to persons or to the natural resources. A systematic remediation of contaminated sites is therefore not required.

The polluter's obligation to remediate does not suffer exceptions for historical contaminations, older than thirty years^[53] (thirty years is the limit chosen by the ELD Directive for the obligation to restore environmental damage in general).

D. CLR in Spain

With regard to the allocation of costs, the Spanish CLR is somewhere in the middle between the description of Model 2 ("*As a priority, the polluter should pay, but where the polluter is not found, it may be possible for residual liability to rest elsewhere on, for example, owners or occupiers of land or the state .*") **and the description of Model 5** ("*The polluter may be liable, but so equally may others be, regardless of fault.*"). Furthermore:

- 1) In cases of **multiple party causation** costs are now allocated following the **joint and several liability rule** ("*responsabilidad solidaria*"), not the proportionate liability rule ("*responsabilidad mancomunada*")^[54].
- 2) When **nobody voluntarily takes on the responsibility for the remediation**, the **responsible parties bear the obligation to reimburse** the costs of the measures, if any, implemented by public authorities.

The Law n. 28/2011 contains the Spanish CLR. Such a legislation establishes **a clear hierarchy among the parties that might be responsible for the remediation**. First, under the polluter-pays principle, the polluter should remediate. In case the polluter is not found or is not in the condition to implement the remediation, the landowner is responsible for the clean-up, due to the importance in general attributed to social responsibility by the Spanish ownership law [55]. In all cases, due to the proportionality principle, the landowner responsibility faces a limit in the land's value. When the landowner also is not in the condition to implement the remediation, then the landholder's responsibility comes into consideration.

The hierarchy described above suffers **an exception** when a private individual or corporation has been authorized to use - in the community's interest - a land owned by the State (**'public concession' regime**). In this case, the responsibility of the landholder comes before the responsibility of the landowner (the State). Prior to Law n. 28/2011, this hierarchy was valid in general, while now it is only applicable to this specific situation.

When there are **several concurrent responsible parties, the Spanish law is openly in favour of a joint and several liability regime**. In other words, the authorities can order the whole remediation to be carried out by one of the responsible parties only.

Differently from what happens in other countries (e.g., in Italy), when a contaminated land has been sold, the Spanish public law seems to take into account the contract's content, while allocating liabilities for the remediation. This is the most relevant principle contained in the important decision n. 349/2012, of 11 June 2012, of the Tribunal Supremo (*"El computo de la gran contaminación de la zona en el precio de las compraventas ... implicaba que los contratos asignaban al contratante adquirente el riesgo que la contaminación pudiera suponer para los futuros usos de la zona, esto es, el coste de la descontaminación necesaria para esos usos"*).

IV. Conclusions: Comparative analysis on key issues

The following table synthetizes our findings on the four CLRs analysed above.

Country	Model of liability*	B. Cost allocation in cases of multiple party causation ^[56]	What happens when nobody voluntarily takes on the responsibility for the remediation
UK	Model 2	Proportionate liability. To this end, liabilities must be normally determined with reference to each contaminant linkage, although this is far from being always easy.	The enforcing authority can carry out at its own cost some remediation actions and is then entitled to recover the reasonable cost incurred from appropriate persons, taking however into account any reasonable hardship which might occur from the recovery.
Italy	Between Model 2 and Model 5	Proportionate liability	The responsible parties bear the obligation to reimburse the costs of the measures, if any, implemented by the public authorities.
France	Model 2	Proportionate liability	The responsible parties bear the obligation to reimburse the costs of the measures, if any, implemented by the public authorities.
Spain	Between Model 2 and Model 5	Joint and several liability	The responsible parties bear the obligation to reimburse the costs of the measures, if any, implemented by the public authorities.

The legal doctrine^[57] has identified **five models of liability for remediating contaminated land:**

- “*Model 1: The polluter should pay and no one else should pay. If the polluter cannot be found, there will be no liability for remediation.*”
- *Model 2: As a priority, the polluter should pay, but where the polluter is not found, it may be possible for residual liability to rest elsewhere on, for example, owners or occupiers of land or the state.*
- *Model 3: As a priority, the right sort of polluter should pay, but if the polluter does not meet those criteria ..., then others may also be liable. Causation is not the only test for being a polluter.*
- *Model 4: Liability is based primarily on fault, not causation.*
- *Model 5: The polluter may be liable, but so equally may others be, regardless of fault.”*
-

3. Relevant Principles

The environmental principles can be distinguished between those “relevant to the notion of prevention in a broad sense” - a typical example of this being the precautionary principle - and those that, such as the polluter-pays principle, are “relevant to considerations of balance”^[58].

I. The polluter-pays principle

The polluter pays principle is, first of all, **an economic rule aimed at correcting a market failure**. It is, among all environmental principles, the most 'preventive' one. The origin of the principle is linked to the economic concept of "externality". Externalities usually occur when there is a divergence between the private and the social cost of an activity. Externalities may be positive or negative. A standard example of negative externality is pollution, e.g. the emissions of an industrial plant which have harmful effects on those occupying neighboring properties[59]. The polluter pays principle seeks to internalize the cost of pollution; in other words, the polluter pays principle establishes that the costs of pollution should be borne by those who caused it[60]. This way '*the cost of pollution should be reflected in the price of services and products and be borne by the polluter, not by society at large*'[61]. That said, it must be pointed out that in the EU various quite different interpretations of this principle coexist[62].

The polluter pays principle is also **one of the fundamental principles of the European Environmental law**, as art. 191(2) of the TFEU states sharply that '*the polluter should pay*'[63]. The principle is mentioned in several conventions[64]. It is also probably a rule of customary law, or, at the very least, given the wide support it receives by the OECD and the EU, it can be considered a regional custom of this area[65].

A frequent **criticism** to the polluter pays principle is that, by putting a price on the right to pollute, it implicitly admits that pollution is inevitable. However, this is not the true aim of the principle. Indeed, the polluter pays principle is substantially consistent with the principle of prevention[66]. Additionally, from an economic point of view, as soon as the costs which the polluter has to bear are higher than the benefits anticipated from continuing to pollute, the polluter has an incentive to reduce pollution (in fact, as long as the marginal abatement cost is lower than the "price" put on pollution, it will be cheaper to abate pollution than continuing to pollute). Additionally, as also the costs for precautionary measures have to be paid by the potential polluters, these subjects have an incentive to reduce risks and to invest in appropriate risk management measures.

At first sight, the polluter pays principle seems to express a quite simple concept. However, the practical application of the principle poses several questions: who is the polluter? how can we define pollution? what the polluter should exactly pay for? and what about pollution caused by many different polluters?

The first formulation of the polluter pays principle can be found in the 1972 OECD Council Recommendation on Guiding Principles concerning the International Aspects of Environmental Policies [67].

The principle, in this version, had a limited meaning and focused on the recommendation to States not to assist polluters in bearing the costs of pollution control by means of subsidies, tax or advantages[68]. During the following years, the application of the principle expanded.

Today, the principle has a broad meaning. Not only does it require the polluter to bear the costs of the measures taken to reduce pollution, but it also involves the reimbursement of the costs of administrative measures (e.g. costs for monitoring and control emissions), damages, compensation to victims[69].

In the theory of externalities, taxation is an appropriate instrument to ensure internalization of costs (the so called Pigouvian tax[70]). Also environmental liability has been considered as a way of implementing the polluter pays principle. If polluters need to pay for the damage caused, they will cut back pollution up to the point where the marginal cost of abatement exceeds the compensation avoided[71]. For instance, the preamble of the ELD (Environmental Liability Directive) states that *'The purpose of this Directive is to establish a framework of environmental liability based on the 'polluter-pays' principle, to prevent and remedy environmental damage'*[72].

With regard to the identification of the "polluter", the principle refers mainly to pollution caused by individuals and enterprises, while the no-harm principle and the prevention principles are more appropriate with reference to pollution caused by States[73]. **At the EU level, the polluter is whoever directly or indirectly damages the environment or creates conditions leading to such damage**[74].

One question is particularly relevant to this research: does the polluter pays principle require that only the polluter should pay, or does it allow other parties to be liable for the pollution[75]?

The answer is extremely relevant: if anyone else can be required to pay, then the cost of polluting is not fully internalized and the impact of the principle is consequently limited[76].

In the **context of contaminated land regimes**, often national legislations indicate that both the polluter and the person who "knowingly permitted the contamination" are liable. It should be noted that whether the polluter pays principle can be applied to the person who "knowingly permitted" the contamination[77] is, at least, doubtful.

As Advocate General Kokott observed in her opinion in joined cases C-378/08, C-379/ and C-380/08, *'liability which does not require a causal link between the activity of the party responsible and the damage would be contrary to the polluter-pays principle. At the same time, however, to derive from the polluter pays principle an absolute prohibition on imposing the costs of remedying environmental damage on parties other than the polluter would be contrary to the aim of encouraging a high level of protection of the environment'*[78].

II. The stewardship principle

The fourth point of the United Nations Millennium Declaration, which states the goal of *"protecting our common environment"*, calls for the adoption of a *"new ethic of conservation and stewardship"*. The concept of stewardship finds its origin in philosophy and religion. The stewardship principle is in fact not exclusively a principle of environmental law. However, it is very important within environmental law, and, in particular, within the CLR, the aim of which is that of improving the state of land and water table, to the interest of future generations[79].

The word steward derives from "sty-wards", which means someone who looks after farm animals, and has links with the term warden[80]. **Stewardship can be either a secular or non-secular concept.**[81].

As an environmental rule, the stewardship principle has been defined by EPA (the U.S. Environmental Protection Agency) as

the responsibility for environmental quality shared by all those whose actions affect the environment. This sense of responsibility is a value that can be reflected through choices of individuals, companies, communities and government organizations, and shaped by unique environmental, social and economic interests. It is also a behavior, one demonstrated through continuous improvement of environmental performance, and a commitment to efficient use of natural resources, protection of ecosystems and, where applicable, ensuring a baseline of compliance with environmental requirements[\[82\]](#).

Another definition says that ‘*the duty of stewardship requires that the owner use and maintain the land in a manner that will not interfere with any significant natural resource that it may contain*[\[83\]](#)’. Also, the concept of stewardship is a ‘*relationship between agents in respect of particular scarce and material resources*’ thus requiring ‘*that control over these resources be exercised with due regard to the interest that other persons, apart from the holder or steward, may have on the resource*’[\[84\]](#).

In general terms, thus, a steward is an individual who devotes a substantial percentage of his thoughts and efforts to maintaining or enhancing the condition of some thing(s) or person(s), not primarily for its own sake. The environmental steward will focus on preserving the natural world[\[85\]](#).

The stewardship principle has also been linked to the idea of trust. According to EB Weiss, each generation is both a trustee for the planet with obligations to care for it and a beneficiary with rights to use it[\[86\]](#).

From a secular point of view the principle of stewardship finds its first justification in intergenerational equity. In this sense, stewardship has been compared to sustainability; the main difference being that stewardship also implies answerability.

Indeed, answerability/accountability is one of the fundamental aspects of stewardship[\[87\]](#). The steward, therefore, on the one side shall manage natural resources in a way that takes into account interests of society, future generations, other species, as well as private needs, and, on the other, must also accept ‘*significant answerability*’ for their choices. A central idea of stewardship is in fact looking after something “in trust” for someone else.[\[88\]](#).

In **environmental stewardship**[\[89\]](#) individuals are called to serve the public interest or the interest of future generation, either on a voluntary basis[\[90\]](#) or on the ground of a legal obligation. Thus, one question is “to whom” the steward should be accountable[\[91\]](#). The first answer is that the steward is responsible “to society” [\[92\]](#), where society means both present and future generations; ;different subjects, such as the State or NGOs, could act as proxy for future generations[\[93\]](#). Assuming that ethical and moral reasons are the bases of the steward behavior, one could argue that people become accountable, firstly, to their conscience[\[94\]](#). In this sense, it has also been argued that the ‘*job of intergenerational conservation*’ is too big and too complex to be left to governments[\[95\]](#).

The landowner is often indicated as the more appropriate figure to act as a steward. Landowners in fact are those who retain decision-making power about their properties; thus, they are naturally best-placed in the position to account for the environment[96].

Much of the debate regarding stewardship as a legal principle, thus, concerns the relationship between stewardship obligations and property rights. From this perspective, the "*fundamental question facing all the 'owners' of natural resources or real property ... is whether the nominal title to property confers upon its holder a right to unrestricted possession and unrestrained use of the property or merely the right to use it for purposes that are socially acceptable at the time of such use*"[97].

In this sense, stewardship leads to a **re-thinking of property rights**. The landowner has no right to destroy their land because this resource is scarce, non-renewable and indispensable for humans' survival. Therefore, the owner rights must be subject to some limitations which are justified in the light of the public interest[98]. However, '*in exchange for relinquishing part of the liberty interest, the individual will gain some assurance that a long-term survival interest of the community is being served, and that others will be acting as stewards as well*'[99]. Stewardship obligations, it has been argued, can be seen also as a '*new species of property rule in that they impose positive obligations as an attribute of the exercise of property*'[100].

III. The precautionary principle

The idea underlying precaution in international law is that any '*lack of scientific certainty about the actual or potential effects of an activity must not prevent states from taking appropriate measures*'[101]. The precautionary principle, which appeared in the mid 80's[102], reflects concepts that are usually applied also in common daily life and that are mirrored in the use of aphorisms such as "better safe than sorry"[103].

In the **Rio Declaration on Environment and Development** the precautionary principle is worded as follows:

In order to protect the environment, the precautionary approach shall be widely applied by states according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation[104].

The first official text in which the precautionary principle can be found at international level is the 1982 World Charter for Nature (principle 11, b))[105]. Although there is no express mention of the term "precaution" or similar expressions, Principle 11b does include all the basic elements of the precautionary principle: reference to an unacceptable threat of environmental/health damage, scientific uncertainty, precautionary measure[106].

The precautionary principle is **one of the fundamental principles of EU environmental law**(art. 191 (2) TFUE). The principle is not defined in the Treaties or other piece of legislation, thus the EU Commission issued a Communication on the precautionary principle to fill this gap. The Communication states that *‘recourse to the precautionary principle presupposes that potentially dangerous effects deriving from a phenomenon, product or process have been identified, and that scientific evaluation does not allow the risk to be determined with sufficient certainty’*[107]. Two main points of the Communication need to be underlined. First, according to the Commission *‘measures based on the precautionary principle should be ... proportional to the chosen level of protection’*[108]. Second, the Communication expressly allows the use of a cost-benefit analysis in the implementation of the principle. At the same time, it is recognized that the analysis should include also non-economic aspects and that *‘the protection of health takes precedence over economic considerations’*[109].

The version of the principle expressed in the Rio Declaration is the most widely accepted in international law[110]. However, there are still some uncertainties in its interpretation, such as the definitions of the concepts of “serious and irreversible damage” and of “scientific uncertainty”, or the distinction between the “duties” of the States “according to their capabilities”[111].

It is generally accepted, even taken for granted, that, under the precautionary principle, some measures should be taken even in situations of scientific uncertainty. However, choosing which specific measures to implement is a demanding task. And it is precisely the lack of scientific certainty which leads to a variety of possible measures, often ranging from basic and cheap emergency steps to very lengthy and costly remediation strategies.

Usually, academics distinguish between two different versions of the precautionary principle: the weak version and the strong version. The weak (or ‘active’) version suggests that lack of scientific evidence of harm should not be a justification for inaction and usually, in order for some actions to be taken, requires the presence of a significant risk of harm and can imply cost-benefit considerations. An example of weak formulations of the precautionary principle can be found, for instance, in the Rio Declaration.

On the contrary, the strong (or ‘passive’) version requires that no activity whose consequences are not fully understood take place and put the burden of proving that an activity is harmless on the proponent of the activity itself. Examples of this version can be found in the World Charter For Nature and in the Cartagena Protocol on Biosafety to the Convention on Biological Diversity. The strong version may even require that action should be taken as soon as there is evidence that harm might occur[112].

The strong version of the precautionary principle has been strongly criticized by some authors who focus on the potential “paralyzing” effect of the principle. On the one hand, every human activity could be said to have an adverse impact on the environment. On the other hand, because of the nature of environmental problems, the very notion of hundred per cent scientific certainty regarding environmental effects is unrealistic. Therefore, an interpretation of the precautionary principle demanding prior conclusive proof of no harm whatsoever would impose unrealistic burden of proof on proposers of new activities and products [113].

The precautionary principle is strictly linked to the concept of risk and should be analyzed taking also into account risk regulation regimes[114]. Risk, in modern, post-industrial societies, has a wider impact than it had in the past[115]. Risk regulation can be understood as that body of regulation concerned with protecting the environment or human health from the risks arising from industrial activities. A number of tools have been developed in order to deal with risk problems, such as risks assessment[116]. The precautionary principle is particularly relevant where decisions in risk regulation involve scientific uncertainty over possible health or environmental damage[117].

The ‘*degree of uncertainty surrounding the probability of risk*’[118] is the main difference between the precautionary principle and the principle of prevention; the former regards regulation of uncertain environmental risks while the latter concerns minimizing harm associated with identified environmental risks.

Although the concept of risk is permeated with uncertainty, measures based on the precautionary principle must be linked to a **minimum of knowledge**. This means that the precautionary principle may be applied if there are “reasonable grounds” for concern, even when irrefutable proof is lacking. Additionally, even in cases where there is a scientific and serious ground for concern about a possible damage, the decision-maker could still prefer to run the risk. This because risk reduction necessarily implies redistribution of resources and, therefore, decision-makers will weigh the ecological cost of inaction against the socio-economic cost of the measure intended to avert the anticipated risk[119].

It has also been noted that the precautionary principle is an “administrative” principle, aiming to guide the decision-making process and, in particular, requiring decision-makers to take scientific uncertainty seriously in the pursuit of environmental and health protection[120].

IV. The principle of environmental harm (no harm principle)

The no-harm principle is closely linked to the doctrine of state sovereignty[121] and has been considered as a corollary[122] to the principle of permanent sovereignty over natural resources[123]. It is also referred to as the duty to prevent transboundary harm or the responsibility not to cause environmental damage.

The **classic formulation of the no harm principle** can be found in the *Trail Smelter Case* (United States v Canada) and in the Lac Lanoux arbitration (France v. Spain)[124].

Both these cases focused on transboundary harm rather than on the environment as an international common good. The principle, as applied in the Trail Smelter case, can also be seen as an extension of the principle of good-neighborliness[125]. The origin of the principle of no harm, in fact, can be found in the old principle of international law according to which states are obliged not to inflict damage on, or violate the rights of, other states (*sic utere tuo ut alienum non laedes*)[126].

The principle has evolved to include not only the territory of other states but also territories beyond states' jurisdiction. This change reflects the increased awareness of the international community as regards the values of environmental protection. Indeed, Principle 21 of the Stockholm Declaration, provides that States have *'the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction'*[\[127\]](#).

This principle mentions the **damage to the environment**, thus definitively shifting the focus from territorial integrity and consequences of transboundary damage only to environmental protection in a broader sense.

The same principle expressed in art. 21 of the Stockholm Declaration was embodied in the Rio Declaration, (article 2[\[128\]](#)), as well as in many other treaties[\[129\]](#). This more comprehensive notion, is now part of customary law, as confirmed by the ICJ in its *Advisory opinion on the Legality of Nuclear Weapons*[\[130\]](#).

There are still some aspects of the principle that need to be clarified such as, in particular, whether the obligation not to cause environmental harm is an obligation of conduct or an obligation of result and the notion of transboundary environmental harm.

The legal doctrine considers the obligation not to cause transboundary harm as one of conduct, since considering it as an obligation of result may lead, in the end, to a form of strict liability. The commentary to the International Law Commission (ILC) Draft Articles on Prevention of Transboundary Harm from Hazardous Activities confirms that:

[...] the obligation of a state of origin to take preventive or minimization measures is one of due diligence. It is the conduct of the State of origin that will determine whether the State has complied with its obligation under the present articles.[\[131\]](#)

However, **if the duty not to cause environmental damage is an obligation of conduct, what - in practice - is the conduct required to States in order to avoid responsibility?** Preliminarily, it should be noted that the content of the obligation might vary according to the State in question (e.g. developed or developing country). With regard to the criteria that can be used in order to determine the content of the obligation, two different aspects should be taken into account. First, the no harm principle and the prevention principle are strictly interconnected. Preventive obligations are among the basic elements of the no harm rule[\[132\]](#). Second, another criterion that can be used is the respect of international environmental standards, meaning technical standards that are set out in conventions, guidelines, national laws[\[133\]](#).

With particular reference to the environmental realm and to the CLR, environmental damage will “*also impact upon property rights*”, which refer not only to individual rights, but also to “*the community of landowners*”[\[134\]](#).

However, we should wonder whether, in the future, we will be able to propose, in the environmental realm, something similar to the VLS (Value of Statistical Life) proposed since the seventies in order to price lives for corporate and governmental risk decisions[135].

Per visualizzare la parte II del contributo [clicca qui](#).

[1] For a terminological discussion of this kind, see Brandon, E. *Global Approaches to Site Contamination Law* (2013 Springer), 6-7.

[2] Fisher, E., Lange, B. and Scotford, E., *Environmental Law: Text, Cases and Materials* . (Oxford University Press, 2013), 69. As the same Authors point out later in the book (p. 968), “At first glance, the environmental law topic of ‘the law relating to land contamination’ seems straightforward.... Yet, the problem of land contamination and the laws relating to it are the most paradigmatic examples of the complexities of environmental law. Rather than a discrete environmental problem, land contamination is more a microcosm that encapsulates the polycentric, scientific, and socio-political difficulties we see in all environmental problems... In particular, land contamination is both a problem to do with pollution and with land use. Moreover, it is a problem with a temporal dimension – ‘contamination’ has occurred in the past”.

[3] The EU Commission proposed a A Soil Framework Directive in 2006; which has been withdrawn in 2014 because Member States could not find an agreement on the text. See on this topic: P. Stankovics, G. Tòth, Z. Tòth ‘Identifying Gaps between the legislative tools of soil protection in the EU Member States for a Common European Soil Protection Legislation’ Sustainability, 2018, 10 2886.

[4] Brandon, E. *Global Approaches to Site Contamination Law* (2013 Springer), 354.

[5] Emma Lees, ‘The polluter pays principle and the remediation of the land’, *International Journal of Law in the Built Environment*, (2016), 6-10.

[6] Identifying the appropriate responsible party implies answering the following question: Can the contamination (or, more likely, its worsening) be (legally) caused by the omission of the due remediation (or of any due emergency containment measures)? Some useful insights on that issue come from legal history. “A liability which extends beyond intentional harm and is expressed by a harm-verb in the active voice – a person is liable if he kills a cow, burns a house, breaks a vase, and so on – will send the law down a cul-de-sac.” The law’s way out of the cul-de-sac is likely to be reversing the original preference of the law (as it was described in the Roman tradition). “At that point the system must finally confront the real problems of remote causation, as opposed to the semantic impediments put in the way by harm-verbs in the active voice” (Birks, P. 1994, 53). This is a legal theory problem which clearly exceeds the limits of the present research.

[7] E Fisher, EC Charlotte Fisher, B Lange, E Scotford, *Environmental Law: Text, Cases & Materials*, (2013) Oxford, p. 982.

[8] According to the definition given in section 78A(2) of the 1990 Environmental Protection Act, “contaminated land” is any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances, in, on or under the land that – a) a significant harm is being caused or there is a significant possibility of such harm being caused, or b) significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused”. “Harm” means the harm to the health of living organism or other inference with the ecological system. The guidance identifies certain specific health effects that should always be considered constituting a significant harm to human health. Depending on the level of “harm”, the land has to be classified differently (Categories 1 to 4). The rules on risk assessment provided for in the Guidance equally apply to lands and waters. According to section 78A(9) of Part 2A “pollution of controlled water” means “the entry into controlled waters of any poisonous, noxious or polluting matter or any solid waste matter”.

[9] Emma Lees, *Interpreting the contaminated land regime: should the polluter pay?* (2012), *Environmental Law review*, 14, 98-110, p. 98-99.

[10] E. Fisher, EC Fisher, B Lange, E Scotford, *Environmental Law: Text, Cases & Materials*, (2013) Oxford, p. 998.

[11] DEFRA, *Environmental Protection Act 1990: Part 2A, Contaminated Land Statutory Guidance*, April 2012, introduction. Available at: <https://www.gov.uk/government/publications/contaminated-land-statutory-guidance>.

[12] E. Fisher, EC Fisher, B Lange, E Scotford, (n. 9), p. 983.

[13] See V Fogleman, ‘The contaminated land regime: time for a regime that is fit for purpose (part 2)’, 2014, *International Journal of Law in the Built Environment*, vol. 6 No 1/2, (129-151) 142-143.

[14] Emma Lees, ‘Contaminated land regime – New Guidance and a New Philosophy?’ *Environmental Law Review* (2012) 267-278, p. 268

[15] DEFRA, *Environmental Protection Act 1990* n. (10), paragraph 1.6. “The authority should use its judgment to strike a reasonable balance between: a) dealing the risks raised by contaminants in land and the benefits of remediating land to remove or reduce those risk; b) the potential impacts of regulatory intervention including financial costs to whoever will pay for the remediation (including the taxpayer where relevant), health and environmental impacts of taking action, property blight, and burdens on affected people”.

[16] Emma Lees, ‘Contaminated land regime – New Guidance and a New Philosophy?’ *Environmental Law Review* (2012) 267-278, p. 273. The aim of the regime is “to tackle a particular problem, not to remove the totality of the historical legacy of contaminated land” (Emma Lees, *Contaminated land regime – New Guidance and a New Philosophy?* *Environmental Law Review* (2012) 267-278, p. 271).

[17] Emma Lees, ‘Interpreting the contaminated land regime: should the polluter pay?’ (2012), *Environmental Law review*, 14, 98-110, p. 99.

[18] DEFRA, *Environmental Protection Act 1990: Part 2A, Contaminated Land Statutory Guidance*, April 2012, paragraph 6.1. Available at: <https://www.gov.uk/government/publications/contaminated-land-statutory-guidance>.

[19] *Environmental Protection Act 1990*, Part 2A, section. 78F(2).

[20] *Environmental Protection Act 1990*, Part 2A, section 78F(4).

[21] V. Fogleman, ‘The contaminated land regime: time for a regime that is fit for purpose (part 2)’, 2014, *International Journal of Law in the Built Environment*, vol. 6 No 1/2, (129-151) p. 129

[22] Environmental Protection Act 1990, Part 2A, section 78F.

[23] DEFRA, *Environmental Protection Act 1990* n. (10), paragraph 7.92.

[24] DEFRA, *Environmental Protection Act 1990* n. (10), paragraph 7.92-7.98. In these cases, “*the enforcing authority should bear itself the cost of any remediation action which is carried out*”. In some cases, the cost of the remediation activities can be asked to the appropriate persons, taking, as usual, into account any “*hardship which the recovery may cause to the person from whom the cost is recoverable*”. Section 78 (P) of the Environmental Protection Act 1990 details how to recover the costs incurred by the Administration.

[25] DEFRA, *Environmental Protection Act 1990* n. (10), paragraph 7.12. More specifically, a shared action may be a “*common action*”, meaning an action that would have been part of the remediation package for each of those linkages if each of them had been addressed separately. Instead, it may be a “*collective action*” that is an action which addresses together all of the significant contaminant linkages to which it is referable, but which would not have been part of the remediation package for every one of those linkages if each of them had been addressed separately (paragraph 7.13).

[26] DEFRA, *Environmental Protection Act 1990* n. (10), paragraph 7.13.

[27] DEFRA, *Environmental Protection Act 1990* n. (10), paragraph 7.90 establishes that when an appropriate person demonstrates that the result of an attribution would impose on the group a liability “*so disproportionate [...] as to make the attribution of responsibility between different groups unjust when considered as a whole, the enforcing authority should reconsider the attribution*”

[28] Test 1 (excluded activities) aims to exclude from the liability group persons who have been identified as members of a liability group solely on the ground that they have carried out certain activities, specifically identified. Test 2 (payments for remediation) aims to exclude from liability those who have already made some payments to other members of the liability group, which would have been sufficient to pay for remediation. Test 3 (sold with information) aims to exclude from information those who, although they have caused or knowingly permitted the contamination, have disposed of that land in circumstances where it is reasonable that another member or the group – who has acquired the land - should bear the liability. Test 4 (changes to substances) aims to exclude from liability those who caused or knowingly permitted the presence of a substance that led to the contamination of the land only because of its interaction with another substance that was later introduced. Test 5 (escaped substances) applies where the land has become contaminated as result of the escape of a substance from other land and aims to exclude from liability those who are not responsible for the escape. Test 6 (introduction of pathways or receptors) aims to exclude from liability those who would otherwise be liable solely because of the subsequent introduction by others of the relevant pathways or receptor.

[29] According to section 7(e) of the Guidance, members of Class B liability Group should be excluded from liability when they do not have an interest in the capital value of the land in question (e.g. those who occupies the land under a license or agreement that has no marketable value).

[30] DEFRA, *Environmental Protection Act 1990* n. (11), paragraph 7.31.

[31] V Fogleman, ‘The contaminated land regime: time for a regime that is fit for purpose (part 1)’, 2014, *International Journal of Law in the Built Environment*, vol. 6 No 1/2, (43-68), p. 44.

[32] DEFRA, *Environmental Protection Act 1990* n. (10), paragraph 7.64.

- [33] Where information on the relative capital values is not available, the authority should apportion liabilities in equal shares among the appropriate persons (DEFRA, *Environmental Protection Act 1990* n. (10), section 7(f)).
- [34] Listed in in section 78N of Environmental Protection Act 1990, Part 2A.
- [35] However, the withdrawal of dedicated central government funding has recently raised widespread criticism.
- [36] DEFRA Circular 01/2006. Environmental Protection Act: Part 2A – Contaminated Land (2006), annex II, paragraph 10.8, available at <https://www.gov.uk/government/publications/defra-circular-01-2006-contaminated-land>.
- [37] DEFRA, *Environmental Protection Act 1990* n. (11), paragraph 8.6.
- [38] Emma Lees, ‘Interpreting the contaminated land regime: should the polluter pay?’ (2012), *Environmental Law review*, 14, 98-110, p. 102-103.
- [39] See paragraph III.2.
- [40] United States Environmental Protection Agency, *Everyday Choices: Opportunities for Environmental Stewardship*, (2005), Washington, p. 2.
- [41] Emma Lees (n. 38), p. 108.
- [42] DEFRA, *Environmental Protection Act 1990* n. (11), paragraph 8.5.
- [43] For a general presentation of this legislation in Italian, see Peres F. ‘Guida all’ambiente – Analisi e commento aggiornato del D.Lgs. nn. 152/2006’, *Ambiente & Sicurezza* 2018.
- [44] Consiglio di Stato sez. V, 30/07/2015, n. 3756; sez. IV, 05/10/2016 n. 4119, sez. IV, 05/10/2016 n. 4099; sez. IV 28/12/2017 n. 6138; T.A.R. Milano sez. IV 02/07/2015 n. 1529; sez. IV 06/11/2017 n. 2088; T.A.R. Firenze sez. II, 09/12/2015, n. 1676 TAR Brescia sez. I, 20/11/2018 n. 1100; sez. I 24/09/2017, n. 897; TAR Veneto sez. III 07/05/2015 n. 493/2015, sez. III 28/03/2017 n. 313; TAR Roma sez. II 22/03/2016 n. 3579. Other decisions (Consiglio di Stato sez. V, 14/04/2016, n. 1509; TAR Piemonte 02/09/2016 n. 1142) point out that some emergency measures must be implemented by the innocent owner or manager also, when this is necessary to be compliant with the precautionary principle, seen as a way to soften the rigidity of the polluter-pays principle, necessary in order to address appropriately a prevailing public interest.
- [45] TAR Veneto, 23/01/2017, n. 65.
- [46] According to a recent Court decision (TAR Emilia, 15/02/2017, n. 125), the responsible party can be identified on the ground of the “more likely than not” rule. Thus, it is not necessary to demonstrate their responsibility “beyond any reasonable doubt”. This creates a problem in the relationship between administrative law and criminal law, as – for the responsible party – “Failure to remediate” is a criminal offence.
- [47] Consiglio di Stato, 30/07/2015, n. 3576.
- [48] See TAR Veneto 25/02/2014 n. 255.
- [49] Art. L.162-18 of the Environmental Code: «*Lorsqu'un dommage à l'environnement a plusieurs causes, le coût des mesures de prévention ou de réparation est réparti par l'autorité visée au 2° de l'article L. 165-2 entre les exploitants, à concurrence de la participation de leur activité au dommage ou à la menace imminente de dommage*».

[50] Art. L162-19 of the Environmental Code: «*Lorsqu'elle a procédé ou fait procéder à l'exécution d'office des mesures de prévention ou de réparation sans recourir aux dispositions du 1° du II de l'article L. 162-14, l'autorité visée au 2° de l'article L. 165-2 en recouvre le coût auprès de l'exploitant dont l'activité a causé le dommage. Elle peut décider de ne pas recouvrer les coûts supportés lorsque le montant des dépenses nécessaires à ce recouvrement est supérieur à la somme à recouvrer*». However, according to art. L162-23, “*Le coût des mesures visées aux articles L. 162-4, L. 162-8 et L. 162-9 ne peut être mis à la charge de l'exploitant s'il apporte la preuve qu'il n'a pas commis de faute ou de négligence et que le dommage à l'environnement résulte d'une émission, d'une activité ou, dans le cadre d'une activité, de tout mode d'utilisation d'un produit qui n'étaient pas considérés comme susceptibles de causer des dommages à l'environnement au regard de l'état des connaissances scientifiques et techniques au moment du fait générateur du dommage*”.

[51] The Circulaire du 19 avril 2017 replaced the previous regulations (Circulaire Ministérielle du 08 février 2007 - BO min. Ecologie et dév. durable no 2007/13, 15 juillet 2007) in order to update the CLR methodology to the state-of-the-art in the field. The new Circulaire confirms that the *interprétation de l'état de milieux (IEM)* and the *plan de gestion* are the pillars of the methodology.

[52] For a general presentation of this legislation, see Trebulle, F. G. ‘Sols pollués: le clair-obscur de la loi ALUR Environnement - N° 8-9/2014’, available at https://serdeaut.univ-paris1.fr/fileadmin/cerdeau/Sols_pollués__le_clair-obscur_de_la_loi_ALU.pdf. For a less recent article in English, see Bourgoin, F., ‘Soil Protection in French Environmental Law’ *Journal for European Environmental & Planning Law*, (2006) 3(3), 204-212.

[53] Conseil d'État, 12/04/2013 n. 363282.

[54] See, for a complete analysis of this issue in the Spanish CLR, De la Varga Pastor, A., *El nuevo régimen jurídico de los suelos contaminados. Adaptado a la Ley 22/2011, de 28 de julio, de Residuos y Suelos Contaminados*, (2012Ed. La Ley, Madrid, España), 320-321, text and footnote n. 735.

[55] See, for instance, Spanish Constitutional Tribunal n. 37/1987.

[56] Art. 9 of ELD provides: “*This Directive is without prejudice to any provisions of national regulations concerning cost allocation in cases of multiple party causation especially concerning the apportionment of liability between the producer and the user of a product*”.

[57] Emma Lees, ‘The polluter pays principle and the remediation of the land’, *International Journal of Law in the Built Environment*, (2016), 6-10.

[58] PM Dupuy, JE Vinuales, *International Environmental Law*, (2015 Cambridge University Press) p. 53. See also E. Fisher, EC Fisher, B Lange, E Scotford, *Environmental Law: Text, Cases & Materials*, (2013) Oxford, 402-459.

[59] RH Coase, ‘The problem of social cost’, *The Journal of Law and Economics*, (1960) 3, p. 1.

[60] The Rio declaration on the Environment formulate the polluter pays principles as follows : ‘*National authorities should endeavor to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investments*’. Rio declaration on Environment and Development, available at <http://www.unep.org/documents.multilingual/default.asp?documentid=78&articleid=1163>

- [61] NM De Sadeleer, 'The Polluter-Pays Principle in EU Law - Bold Case Law and Poor Harmonisation' (2012). Pro Natura: Festschrift Til H. C. Bugge, Oslo, Universitetsforlaget, pp. 405-419. Available at SSRN: <http://ssrn.com/abstract=2293317>, p. 406 last accessed 19/09/2016.
- [62] Emma Lees, 'The polluter pays principle and the remediation of the land', *International Journal of Law in the Built Environment*, (2016) 8.
- [63] Consolidated version of the Treaty on the Functioning of the European Union, OJ C326/47 art. 191 (2).
- [64] For instance, the ASEAN Agreement on the Conservation of Nature and Natural Resources, the Convention on the protection of the Alps, the OSPAR Convention, the Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes, the Barcelona Convention for the Protection of the Mediterranean Sea against Pollution, the London Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter. The principle is found also in the preambles of other treaties such as the Lugano Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment and the Helsinki Convention on the Transboundary Effects of Industrial Accidents. See also OECD Recommendations below.
- [65] P Sands, *Principles of International Environmental Law*, (2003 Cambridge University press), p. 280.
- [66] NM De Sadeleer, *Environmental Principles. From political slogans to legal rules*, (2002 Oxford University Press) p. 36.
- [67] OECD Council Recommendation on guiding principles concerning the International Aspects of Environmental Policies, C(72) 128 14 ILM 236 (1975), para 4.
- [68] De Sadeleer, (n. 66) p. 26.
- [69] OECD Environment Directorate, Analysis and Recommendation, *The Polluter Pays Principle*, OECD/GD(92)81
- [70] AC Pigou, *The Economics of Welfare*, (1920, London, Macmillan & Co). Pigou argued that internalization of costs of pollution could be achieved by imposing a tax on polluting activities. In order to be effective the tax should be set at the level where the marginal costs of pollution reduction equal the marginal benefits of polluting. It should be noted that this theory would consider zero-pollution uneconomic, as, in such a case, marginal costs of abatement exceed marginal benefits.
- [71] De Sadeleer, (n. 61). Pro Natura: Festschrift Til H. C. Bugge, Oslo, Universitetsforlaget, (n. 61) pp. 405-419.
- [72] Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage, OJ L/143, art. 1
- [73] PM Dupuy, JE Vinuales, *International Environmental Law*, (2015 Cambridge University Press) p. 72. See also on this topic F. Goisis, L. Stefani, 'The Polluter-Pays principle and site ownership: the European Juriprudential Developments and the Italian Experience', *Journal for European Environmental & Planning Law*, 13 (2016) 218-237.
- [74] 75/436/Euratom, ECSC, EEC: Council Recommendation of 3 March 1975 regarding cost allocation and action by public authorities on environmental matters, Official Journal L 194, 25/07/1975, p. 1 - 4, para 3.
- [75] Emma Lees, 'The polluter pays principle and the remediation of the land', *International Journal of Law in the Built Environment*, (2016), 2-20.
- [76] *ibid* (n. 75), p. 6.

- [77] Emma Lees, *Interpreting Environmental Offences*, (2015 Hart Publishing) p. 97.
- [78] AG Kokott opinion in cases C-378/08, C-379/08 and 380/08, paras 111-112.
- [79] See E. Lochery, 'Does the contaminated land regime impose stewardship obligations on owners of land?' 2011, available at <https://discovery.dundee.ac.uk/en/studentTheses/does-the-contaminated-land-regime-impose-stewardship-obligations-> last accessed 21.6.2019.
- [80] R Worrel, MC Appleby, 'Stewardship of natural resources: definition, ethical and practical aspects', *Journal of agricultural and environmental ethics*, (2000)12, 263-277, 264.
- [81] Christian, Judaism and Islam usually maintain that humanity is answerable to God for the use and the care of nature because humans do not own the earth, but hold it on a provisional basis. RJ Berry, *Environmental Stewardship. Critical perspectives, past and present*. (2006 T&T Clark), p. 76.
- [82] US EPA 'Everyday choices: opportunities for environmental stewardship' (Washington, 2005) p. 2, available at <https://archive.epa.gov/stewardship/web/html/> last accessed 21.6.2019.
- [83] JP Karp 'A private property duty of stewardship: changing our land ethic', *Environmental Law*, (1993) 23(3), 735-762, p. 748.
- [84] WNR Lucy, C Mitchel, 'Replacing private property: the case for stewardship', *Cambridge law journal*, (1996) 55(3), p. 566-600, 584.
- [85] Welchman, 'The virtues of stewardship', *Environmental Ethics*, (1999), 21(4), 411-423 p. 415.
- [86] EB Weiss, 'The Planetary Trust: Conservation and Intergenerational Equity', *Ecology Law Quarterly* (1984), 11(4) 495-582 p. 499.
- [87] Lochery, E. (n. 79), 77. The steward's accountability "is enforced by the state as proxy".
- [88] R Worrel, MC Appleby, 'Stewardship of natural resources: definition, ethical and practical aspects', *Journal of agricultural and environmental ethics*, (2000)12, 263-277, 263 and 266.
- [89] See on this topic Lochery, E. (n. 79).
- [90] J Welchman, 'A defence of environmental stewardship', *Environmental values*, 21 (2012), 297-316, 301.
- [91] CB Barret, RE Grizzle, 'A holistic approach to sustainability based on pluralistic stewardship', available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=141226 last accessed 21.6.2019.
- [92] J Welchman, 'A defence of environmental stewardship', *Environmental values*, 21 (2012), 297-316; R Worrel, MC Appleby, 'Stewardship of natural resources: definition, ethical and practical aspects', *Journal of agricultural and environmental ethics*, (2000) 12, 263-277.
- [93] EB Weiss, (n. 86), p. 565-567.
- [94] CB Barret, RE Grizzle, (n. 91).
- [95] JP Karp 'A private property duty of stewardship: changing our land ethic', *Environmental Law*, (1993) 23(3), 735-762, p. 750.
- [96] E Barritt, 'Conceptualizing Stewardship in Environmental Law', *Journal of Environmental Law*, (2014), 26, 1-23, p. 9.
- [97] Yannacone Jr, V. J. 1978, p. 71.
- [98] JP Karp 'A private property duty of stewardship: changing our land ethic', *Environmental Law*, (1993) 23(3), 735-762, p. 752-753.
- [99] *ibid* (n. 98), p. 760.
- [100] Cristopher Rodgers, 'Nature's place? property rights, property rules and environmental stewardship', *Cambridge law journal*, 68(3), November 2009, 550-574, p. 569.

[101] PM Dupuy, JE Vinuales, *International Environmental Law*, (2015 Cambridge University Press) p. 61.

[102] The 1984 Bremen Ministerial Declaration of the International Conference on the Protection of the North Sea, the 1987 London Ministerial Declaration of the International Conference on the Protection of the North Sea, 1985 Vienna Convention for the protection of the ozone layer, 1987 Montreal Protocol on Substances that Deplete the Ozone Layer.

[103] A Trouwborst, *Evolution and status of the precautionary principle in international law*, (2002 Kluwer law international), p. 8. For a specific study on the role of the precautionary principle in international environmental law, with an analysis of the implementation “errors” both in the safe and in the unsafe side, see Butti, L. 2007.

[104] Rio Declaration on Environment and Development, principle 15, available at <http://www.unep.org/documents.multilingual/default.asp?documentid=78&articleid=1163>

[105] ‘Activities which are likely to pose a significant risk to nature shall be preceded by an exhaustive examination; their proponents shall demonstrate that expected benefits outweigh potential damage to nature, and where potential adverse effects are not fully understood, the activities should not proceed’ UN General Assembly resolution, A/RES/37/7, World Charter for Nature, available at <http://www.un.org/documents/ga/res/37/a37r007.htm>, last accessed 21.6.2019.

[106] M Ahteensuu, P Sandin ‘The precautionary principle’ in Sabin Roser, Rafaela Hillerbrand, Per Sandin, Martin Peterson (eds.), *Handbook of risk theory, epistemology, decision theory, ethics and social implications of risk* (2012 Springer Science and Business Media) p. 960-978, p. 966.

[107] Commission, *Communication from the Commission on the precautionary principle*, COM(2000) final, para 4.

[108] *ibid* (n. 107), para 6: ‘Where action is deemed necessary, measures based on the precautionary principle should be, *inter alia*:

1. *proportional to the chosen level of protection,*
2. *non-discriminatory in their application,*
3. *consistent with similar measures already taken,*
4. *based on an examination of the potential benefits and costs of action or lack of action (including, where appropriate and feasible, an economic cost/benefit analysis),*
5. *subject to review, in the light of new scientific data, and*
6. *capable of assigning responsibility for producing the scientific evidence necessary for a more comprehensive risk assessment.*
7. *Proportionality means tailoring measures to the chosen level of protection. Risk can rarely be reduced to zero, but incomplete risk assessments may greatly reduce the range of options open to risk managers’.*

[109] *Communication from the Commission on the precautionary principle*, (n. 19), para 6: ‘Examining costs and benefits entails comparing the overall cost to the Community of action and lack of action, in both the short and long term. This is not simply an economic cost-benefit analysis: its scope is much broader, and includes non-economic considerations, such as the efficacy of possible options and their acceptability to the public. In the conduct of such an examination, account should be taken of the general principle and the case law of the Court that the protection of health takes precedence over economic considerations’.

- [110] PM Dupuy, JE Vinuales, *International Environmental Law*, (2015 Cambridge University Press) p. 61, NM De Sadeleer, *Environmental Principles. From political slogans to legal rules*, (2002 Oxford University Press), p. 100.
- [111] PM Dupuy, JE Vinuales, (n. 110) p. 63.
- [112] CR Sustain, 'Beyond the precautionary principle', *University of Pennsylvania Law Review* (2003), 151(3), 1003-1058, p. 1015.
- [113] A Trouwborst, *Evolution and status of the precautionary principle in international law*, (2002 Kluwer law international), p. 15.
- [114] E Fisher, 'Precaution, Precaution Everywhere: Developing a "Common Understanding" of the precautionary principle in the European Community', *Maastricht Journal of European Comparative Law*, (2002) 9, 7-28, 19.
- [115] *ibid* (n. 114) p. 152
- [116] Recently, the process of implementing the precautionary principle in a consistent and proportionate way has been formalized (see Steel, D. 2015, 218-233), in order to enable some aspects of its interpretation to be expressed more clearly.
- [117] E Fisher, 'Is the Precautionary principle justiciable?' *Journal of Environmental Law*, (2001), 13(3), 315-334, p. 317-318.
- [118] NM De Sadeleer, *Environmental Principles. From political slogans to legal rules*, (2002 Oxford University Press), p. 75.
- [119] *ibid* (n. 118), p. 167.
- [120] E Fisher, R Harding 'The precautionary principle and administrative constitutionalism: the development of frameworks for applying the precautionary principle', in E Fisher, J Jones, R von Shomberg (eds), *Implementing the precautionary principle: perspectives and prospects* (2006, Edwards Elgar), 113-136, available at <http://papers.ssrn.com/Abstract=908644> last accessed 21.6.2019.
- [121] E Hey, *Advanced introduction to International Environmental Law*, (2016 Edward Elgar Publishing), p. 59
- [122] PM Dupuy, JE Vinuales, *International Environmental Law*, (2015 Cambridge University Press), p. 56
- [123] The principle of permanent sovereignty over natural resources have been recognized in the UN General Assembly resolution number 1803 ('Permanent sovereignty over natural resources', 14 December 1962, GA Res. 1803 (XVII)).
- [124] *Trail Smelter Arbitration* RIAA, vol. III, p. 1905-82 p.1965 ('*Trail Smelter*')
- [125] P Sands, *Principles of International Environmental Law*, (2003 Cambridge University press), p. 242
- [126] M Jervan, 'The prohibition of transboundary harm. An analysis of the contribution of the International Court of Justice to the Development of the No-harm principle', *PluriCourts Research Paper*, n. 14-7, 2014, p. 1.
- [127] Declaration of the United Nations Conference on the Human Environment (Stockholm Declaration), 1972 available at <http://www.unep.org/documents.multilingual/default.asp?documentid=97&articleid=1503> last accessed 21.6.2019.

[128] Rio Declaration on Environment and Development available at <http://www.unep.org/documents.multilingual/default.asp?documentid=78&articleid=1163>, art. 2: *States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.*

[129] The 1981 Lima Convention for the protection of the Marine environment, the 1982 United Nations Conventions on the Law of the Sea (UNCLOS), the 1985 ASEAN Convention (Agreement on the Conservation of Nature and Natural Resources), the 1991 Convention on Environmental Impact Assessment in a transboundary context (Espoo Convention), 1992 Convention on the Transboundary Effects of Industrial Accidents, Charter of Economic Rights and Duties of States (Article 30).

[130] *'The Court recognizes that the environment is under daily threat and that the use of nuclear weapons could constitute a catastrophe for the environment. The Court also recognizes that the environment is not an abstraction but represents the living space, the quality of life and the very health of human beings, including generations unborn. The existence of the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national jurisdiction is now part of the corpus of international law relating to the environment'* *Legality of the Threat or Use of Nuclear Weapons*, ICJ Reports 1996, (*Legality of Nuclear Weapons*) p. 226 para 29.

[131] International Law Commission, *Draft Articles on Prevention of Transboundary Harm from Hazardous Activities with commentaries*, (2001), commentary to art. 3, point 7, available at http://legal.un.org/ilc/texts/instruments/english/commentaries/9_7_2001.pdf (last accessed 21.6.2019).

[132] Ilias Plakokefalos, 'Prevention obligations in international environmental law', Amsterdam Center for International Law Paper, no 2013-12 available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2290211, p. 40.

[133] *ibid* (n. 132) p. 41. See also commentary to ILC Articles on prevention, article 3 *'the present article...provides that States shall take all appropriate measures to prevent significant transboundary harm or at any event minimize the risk thereof. [...] In addition, it imposes an obligation on the State of origin to adopt and implement national legislation incorporating accepted international standards. These standards would constitute a necessary reference point to determine whether measures adopted are suitable'*.

[134] Emma Lees, *Interpreting Environmental Offences*, (2015 Hart Publishing). 150-151.

[135] See KW Viscusi, 'Pricing lives for corporate risk decisions' *Vanderbilt Law Review*, May 2015, Forthcoming
Vanderbilt Law and Economics Research Paper No. 14-26 available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2491735, last accessed 21.6.2019.

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