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# Developing environmental liability legislation in the Republic of Moldova

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# Acronyms and abbreviations

| | |
|---|---|
| **CVM** | Contingent Valuation Method |
| **DSAY** | Discounted-Service-Acre-Year |
| **EC** | European Commission |
| **ECA** | European Court of Auditors |
| **EEC** | European Economic Community |
| **EECCA** | Eastern Europe, Caucasus and Central Asia |
| **ELD** | Environmental Liability Directive |
| **EP** | European Parliament |
| **EPA** | Act LIII of 1995 on the General Rules of Environmental Protection |
| **EU** | European Union |
| **EUECJ** | Court of Justice of the European Communities |
| **EUR** | Euro |
| **HEA** | Habitat Equivalency Analysis |
| **LVL** | Latvian lat |
| **MSFD** | Marine Strategy Framework Directive |
| **NEF** | National Ecological Fund |
| **NGO** | Non-governmental organization |
| **NRDA** | Natural Resource Damage Assessment |
| **OECD** | Organisation for Economic Co-operation and Development |
| **REA** | Resource Equivalency Analysis |
| **UNECE** | United Nations Economic Commission for Europe |

| | |
|---|---|
| **UNEP** | United Nations Environment Programme |
| **UNIDO** | United Nations Industrial Development Organisation |
| **VEA** | Value Equivalency Analysis |
| **WFD** | Water Framework Directive |
| **WTP** | Willingness to Pay |
| **WTAC** | Willingness to Accept Money as Compensation |

# Introduction

The government of the Republic of Moldova plans to update provisions for the environmental liability of polluters in its environmental legislation, taking into account international best practices. As part of a project called “Green justice for stronger environmental protection and communities in Moldova (Green Justice Steps)”, which runs from 2021-2025 and is financed by Sweden, the EcoContact NGO in Moldova plans to support the government with transposing the EU Environmental Liability Directive (ELD).

This report was prepared in the framework of the EU-funded EU4Environment Action project in order to provide analytical support to Moldova’s Ministry of Environment and the EcoContact NGO as regards designing the country’s environmental liability legislation. It follows an earlier EU4Environment report which assessed Moldova’s entire environmental compliance assurance system and was published in 2022.

The first chapter of this report introduces the main features and principles of the ELD and describes the existing environmental liability provisions in Moldova. It provides recommendations on how Moldova’s legislation can better approximate the ELD, supported by examples of ELD implementation in several EU Member States. A key question it attempts to address is whether a stand-alone law or amendments to existing legislation would be a more effective approach to transposing the ELD.

The second chapter of the report focuses on environmental damage assessment provisions in Moldova.

# 1 The EU Environmental Liability Directive and Moldova's adherence to its principles

## The Requirements of the Environmental Liability Directive

### *Overview*

The purpose of the Environmental Liability Directive (ELD) is to establish an EU-wide framework of environmental liability to prevent and remedy particular types of environmental damage, specifically damage to: (i) protected species and natural habitats, (ii) water and (iii) land. It is an administrative liability regime, not a civil liability one. The ELD does not give third parties, such as the state, citizens or corporations, a right to seek from the polluter *monetary* compensation, such as payment of punitive damages (i.e., damages intended to deter the operator from engaging in unlawful conduct) for: (i) environmental damage or an imminent threat of it; or (ii) damage caused to personal property, bodily injury and/or economic loss (i.e., traditional damage). These will be matters for the domestic laws of the Member State. The civil laws of many, if not all, EU Member States will provide for (ii). Some Member States, such as Hungary and Latvia, provide for (i) in the form fines under their administrate laws in event of non-compliance with the ELD.

### *The Polluter-Pays Principle*

The ELD is based on the Polluter-Pays Principle (article 1). In the context of the ELD this means that an operator causing environmental damage or creating an imminent threat of it should, in principle, bear the cost of the necessary preventive or remedial measures (recital 18). The 'operator' is the natural or legal, private or public person that 'operates' or 'controls' the relevant activity from which the damage emanates (article 2(7)). Operators should also bear associated administrative expenses, e.g., assessing environmental damage (recital 18). These costs, and other costs incurred by the competent authority, can be recovered via taking security over the operator's property (i.e., placing a 'charge' on the operator's property, such as real estate, to provide the competent authority with a legal claim over the asset which empowers it to sell the asset to recover the outstanding sum in the event that the operator is unable or unwilling to pay for these costs) or through some other guarantee provided by them (article 8(2)).

The principle is built upon the economic idea of cost internalisation. This requires an operator to "cover" the costs which its activities impose on others in the "pricing" of its goods or services (Ogus, 2004[1]). When the operator need not bear these costs, not only can they ignore them in deciding how much to produce and at what price to sell, the unpriced costs – negative externalities – are transferred to local communities, the environment and wider society as the case may be (Ogus, 2004[1]). This is a form of market failure. Through its allocation of environmental costs to the operator, such as those associated with cleaning-up the pollution it causes, the principle facilitates the 'internalisation' of these costs. This ensures that these costs are made "part of the economic process rather than a forgotten after-effect of it" (Humphreys, 2001[2]). The principle also has a deterrent function. This derives from the fact that as

potential polluters know that they will be liable for the costs of remedying the damage that they cause, they have a strong incentive to avoid causing it in the first place (European Commission, 1993[3]).

To be clear, the principle, as articulated under the ELD, does not seek to "punish" the operator that caused the damage by way of the imposition of a fine or criminal sanction. Indeed, the ELD does not provide for the imposition of penalties for breaches of environmental law (EUECJ, 2017[4]). The ELD is, instead, limited to imposing an obligation to provide for measures for preventing and remediating such damage and allocating responsibility for the costs of associated with these measures. It is, however, lawful for the domestic laws of a Member State to impose penalties for breach of the ELD's requirements. As we shall, certain Member States (e.g., Hungary and Latvia) chose to do so.

There are, however, failings in the way the ELD implements the principle. For instance, a lack of mandatory financial security requirements means that taxpayers may end up paying for the requisite remediation when an operator that has caused damage becomes insolvent ( (ECA, 2021[5]). The failure to impose mandatory financial security requirements was driven, in large part, by the lack of practical experience in the application of the ELD, meaning that a lack of certainty and predictability for stakeholders, such as insurers, existed (European Commission, 2010[6]). Nevertheless, operator insolvency due to major accidents remains a problem (European Parliament, 2021[7]). Furthermore, the EU budget is sometimes used to fund clean-up that should have been borne by polluters where they are insolvent or otherwise unable financially to pay (ECA, 2021[5]). The alternative is for the site to remain unremediated, potentially leaving it in a dangerous condition.

Whilst the majority of EU Member States do not provide for mandatory financial security instruments in their domestic legislation, several do (European Parliament, 2021[7]). The European Parliament resolution of 20 May 2021 on the liability of companies for environmental damage asserts that 'where implemented, these instruments seem to have proved their worth and demonstrated the need to assess the introduction of a mandatory financial security system' (European Parliament, 2021[7]). The Parliament is clearly receptive to reassessing the financial security question. Research conducted for the Commission has noted that the ELD cannot be implemented effectively unless insurance is available for liabilities arising under it (European Commission, 2020[8]). Nevertheless, there does not appear to be any indications that the Commission will introduce mandatory financial security in the immediate future.

### *The Meaning of "Environmental Damage"*

**Damage to water** refers to damage that significantly adversely affects the ecological, chemical or quantitative status or the ecological potential (i.e., status of a heavily modified or artificial body of water) of the waters concerned, or the environmental status of the marine waters concerned (article 2(1)(b)).

**Damage to land** refers to "land contamination" that creates a significant risk of human health being adversely affected due to the direct or indirect introduction, in, on or under land, of substances, preparations (i.e., mixtures or solutions composed of two or more substances) or organisms/micro-organisms (article 2(1)(c)); actual harm to human health need not be proven. This means that damage to land that is not related to contamination, such as land erosion, is not covered by the ELD (article 2(1)(a).

**Damage to protected species and natural habitats** refers to damage that has significant adverse effects on reaching or maintaining the favourable conservation status of protected species or habitats. Article 2(4) sets out when the conservation status of a species or natural habitat will be taken as "favourable". "Damage" is defined as a measurable (i.e., quantifiable or capable of estimation) adverse change in a natural resource or measurable impairment of a natural resource service (e.g., provision of food, shelter or nesting) (article 2(2)). Thus, it must be possible to compare the position before and after the damaging event meaningfully.

The threshold of "significance" is also key. Whilst the final determination of this is for the relevant competent authority (e.g., the environment agency of the relevant EU Member State), Annex 1 of the ELD provides guidance for assessing damage to protected species and natural habitats (but not damage

to water and land). In the European Commission's 2021 guidelines (European Commission, 2021[9]), the meaning of "significant" was stated to be "a matter of objective, *technical* assessment based on measurable data" (European Commission, 2021[9]). However, the European Court of Auditors (ECA) found that the way it was interpreted varied dramatically between Member States, meaning an event that triggered application of the ELD in one Member State may not trigger it in another (ECA, 2021[5]). The European Parliament also found that "differing interpretations and application of the criteria in Annex I to the ELD are one of the reasons for the inconsistent application of the directive" (European Parliament, 2021[7]). The Commission's 2021 Guidelines will go some way to address this.

Impairment of air quality is not currently covered by the ELD and, in itself, air pollution does not constitute "environmental damage". Whilst damage to air is absent from the definition of "environmental damage" under article 2(1), the European Parliament has asked the Commission to reconsider this in light of the harm caused by air pollution to human health and the environment (European Parliament, 2017[10]). The Commission has not disclosed any immediate plans to revise the definition so as to encompass damage to air quality. This may be because the EU has an extensive body of legislation which sets standards and objectives for pollutants in air. Moreover, it is notoriously difficult to remediate damage to air quality. This said, recital 4 of the ELD asserts that environmental damage, "also includes damage caused by *airborne elements* as far as they cause *damage* to water, land or protected species or natural habitats". Thus, the ELD will apply where water, land, protected species or natural habitats are damaged by emissions to air, of the type that may be expected to derive, for example, from the chimneys of factories and other industrial plants.

### *Liability Regimes*

The ELD comprises two distinct liability regimes governing the activities of operators:

1. Strict liability (i.e., liability that is not dependent on establishing fault) for damage to protected species and natural habitats, water, and land caused by any of the occupational activities listed in Annex III of the ELD (e.g., waste management and chemical production).
2. Fault-based liability (i.e., liability for conduct that is negligent) for damage to protected species and natural habitats caused by any occupational activities that are not listed in Annex III (i.e., non-listed activities), and to any imminent threat of such damage, whenever the operator has been at *fault or negligent* (article 3(1)(a)). Fault-based liability does not apply to damage to land or water.

## Environmental Liability Legislation in Moldova

### *Overview*

Moldova's environmental laws cater for two main types of administrative law-based environmental liabilities, which may arise concurrently. The first concerns the need for remediation of damage caused to the environment, limiting its impacts and preventing further damage (e.g., *Law No. 1515 of 16 June 1993 on Environmental Protection*, article 32(e)). The second type, and one most prominent in Moldovan law, is liability to pay *monetary* compensation to the State (e.g., *Law No. 1515 on Environmental Protection*, article 71(c)), often to a dedicated fund, the National Ecological Fund (the "Fund") which is used for the financing of environmental protection programmes (e.g., *Regulation 100 of 18 January 2000 on the temporary provision for the determination of damage caused to the environment*). This requirement to compensate, and thresholds at which this duty arises, is set out in a series of issue-specific instruments (summaries of some of the most pertinent are set out in Annex A of this report). Under *Law No. 1540 of 25 October 1998 on the payment for environmental pollution,* for instance, the need to compensate (i.e., pay funds into the state budget) arises in respect of the release of pollutants into atmospheric air and water bodies: (i) within; and (ii) in excess of, established limits.

### *Law No. 1515 of 16 June 1993 on Environmental Protection*

*Law No. 1515* plays the central, coordinating role in the determination of liability for those that cause damage to the environment. It is the legal basis for the development of acts and instructions on certain issues of environmental protection, e.g., *Instruction No. IMM383/2004 of 8 August 2004 determining damage to soil resources*. Whilst the ELD is limited in scope to administrative liability, breach of *Law No. 1515* can create concurrent administrative liability, civil and criminal liability for the infringer (article 89). There will be administrative liability in respect of the need, for example, for guilty economic entities to eliminate all the consequences of accidents at their own expense and compensate for damage caused to the environment and its components, the property of others and the health of affected persons (article 32(e)). Civil liability may arise, for example, in respect of actions brought by the state against those that cause environmental damage as a result of their pollution and/or unauthorized/unreasonable use of natural resources (article 27(1)(h)). In contrast to the ELD, it also confers the right of citizens to compensation for damage caused by pollution (article 30(h)). *Law No. 1515* requires that preventive measures be undertaken e.g., all economic entities must be equipped to provide installations, equipment and treatment facilities that reduce their harm to the environment below established limit levels (article 32(c)). The state and economic entities may be required to undertake remediation and restoration of environmental damage e.g., guilty economic entities must eliminate the consequences of pollution (i.e., return it to its pre-polluted state) (article 71(c)). Under article 46, the state must carry out work to restore disturbed biosystems (article 46(e)). In stark contrast to the ELD, little to no detail is provided as to how remediation is to be achieved or to which level. This is a major gap under Moldova's environmental liability laws.

The Fund is a prominent feature of *Law No. 1515*. Article 83 caters for its creation within the framework of the state budget. The Department of Environmental Protection is responsible for its establishment and management (article 15(f)). The Fund's purpose is the financing of projects, which have been submitted by local public authorities, enterprises and other organisations, for the protection of the environment. Article 84 demarcates the types of activities which it may be finance. These include, for instance, policy and management in the field of the protection and management of water resources, protection of soil resources, waste and chemicals management, and climate change mitigation and adaptation. The volume of the Fund is approved by the annual law on the state budget (article 83(2)). Under certain instruments, such as *Regulation 100 of 18 January 2000 on the temporary provision for the determination of damage caused to the environment*, whilst compensation is required to be paid to the Fund, this does not exempt perpetrators from the need to implement environmental protection measures (regulation 4.4.3). This may be presumed to include remediation. Thus, payment to the fund need not necessarily alleviate a polluter from the need to undertake appropriate remediation measures. As a matter of practice, however, it seems that the Fund is aimed primarily at strategic infrastructure projects as opposed to redressing pollution and environmental degradation.

### *Acts and Instructions on Issues Relating to Environmental Liability*

A series of other legal instruments, brief summaries of which are provided in Annex A of this report, have a direct bearing on environmental liability. Examples include:

- Law No. 1540 of 25 February 1998 on the payment for environmental pollution,
- Regulation 100 of 18 January 2000 on the temporary provision for the determination of damage caused to the environment,
- Instruction No. IMM383/2004 of 8 August 2004 for determining damage to soil resources,
- Instruction No. IMI385/2004 of 8 August 2004 on the assessment of damage caused to the environment in the conditions of non-compliance with subsoil legislation, and
- Resolution No. 1808 dated 18 August 1999 on the temporary methodology for calculating the damage caused to the environment by violation of water legislation (groundwater pollution).

### *Criminal Code*

Chapter IX of the Criminal Code of Moldova contains a section on environmental crimes. This comprises a broad range of criminal offences, including soil pollution (article 227) and water pollution (article 229). Sanctions include fines, to a specified range, and imprisonment. There is a direct connection between the level of fines and damage caused to the environment, as understood under Moldova's environmental liability laws. Under article 64(4) of the Criminal Code, the amount of the fine for legal entities is to be established taking into account the nature and gravity of the crime committed *and the amount of damage caused*, as well as the financial and economic situation of the legal entity. However, as we have seen, Moldova's environment laws do not deal adequately with the determination of the precise level of damage caused to the environment by economic entities. Moldova has quite a few instruments that provide methodologies for assessing environmental damage, such as in relation to soil and groundwater pollution. However, these are entirely unsuited for use in the context of the ELD as they are focused principally upon establishing, through the use of formulae and equations, the level of *monetary* compensation to be paid by the polluter as opposed to arriving at an objective, scientific determination of the level of damage caused to the environment and the services that it provides. If the level of the fine is to be dictated, at least in part, by the "amount of damage caused", there must be accurate, reliable means of making an assessment of this if it is to be set at the appropriate level. The existing methodologies will need to be discarded and news ones created.

## Assessment

This section will provide an assessment of the key areas of alignment and departure of Moldovan environmental liability legislation with the requirements of the ELD.

### *Alignment with the Polluter-Pays Principle*

The ELD is based explicitly on the Polluter-Pays Principle. Article 3(c) of Moldova's *Law No. 1515 on Environmental Protection* may be considered to comprise an *implicit* conception of the principle under Moldovan law. It states that all natural and legal persons are liable for the damage they cause to the environment and are responsible for bearing the expense of preventing, limiting and controlling pollution *and* providing compensation for damage caused to the environment and its components, even unintentionally or negligently. There is certainly a similarity with the Polluter-Pays Principle as articulated under the ELD, i.e., those that cause or may cause damage must pay for its remediation or prevention. A point of departure does, however, lie in the need to "compensate" for the environmental damage caused. As we have seen, the ELD does not require that polluters provide *monetary* compensation for such damage (though a civil liability claim pursued by a claimant may result in compensation being recovered by third parties in respect of "traditional damage"). Operators are required to take action to "compensate" for interim losses of natural resources and/or services which occur from the date of the damage occurring to when remediation to the baseline condition (i.e., primary remediation) is complete (though, not for land damage). This compensation consists of *additional improvements* to protected natural habitats and species or water at either the damaged site or at an alternative site to ensure provision of a similar level of natural resources and/or services as were foregone, not monetary compensation to third parties. The reference in Moldova's *Law No. 1515* to compensation suggests that it is purely financial.

### *The Primacy of "Compensation" for Damage to the Environment*

The concepts of "damage" and the need for it to be "significant" underpin the ELD. In contrast, pre-determined "limits" on the emission of pollutants and production of waste sit at the heart of the Moldovan approach, with regular references in its laws to the need to provide financial "compensation" to the state in the event of their exceedance. Under Moldova's *Law No. 1515 on Environmental Protection*, the Department of Environmental Protection is responsible for "setting *limits* on the use of

natural resources, harmful emissions and discharges into the environment, and the accumulation of industrial and household waste" (article 15). The detail of these requirements is set out in a series of separate legal instruments, such as *Resolution No. 1808 on the temporary methodology for calculating the damage caused to the environment by violation of water legislation (groundwater pollution)* and *Instruction No. IMM383/2004 for determining damage to soil resources*, that deal with particular instances of pollution, e.g., to groundwater or soil. This type of liability is characterised as a "penal regime designed to punish the party responsible for the damage (or simply non-compliance)" (OECD, 2012[11]). Regulators must rely on methodologies/formulas for calculating payments. These are theoretical and the estimated monetary cost of damages does not reflect the damage caused to the environment (EU4Environment, 2022[12]). This results in an "extremely simplified" assessment which does not require experts to collect data and conduct assessments (OECD, 2012[11]). Whilst this approach is consistent with frameworks of liability in the Eastern Europe, Caucasus and Central Asia (EECCA) region, it has two implications that do not sit comfortably with the ELD. First, the state is to be compensated financially even where the natural resource cannot be restored. Second, environmental damage (and liability for it) arises when these limits are exceeded, not when a marked deterioration in environmental quality actually occurs (OECD, 2012[11]).

### *The Prominence of the Fund*

The Fund plays a central role in the system of environmental liability in Moldova. As we have seen, it sits within the framework of the state budget for the purpose of financing programmes for environmental protection. Compensation funds of this type have the potential to run counter to the true aim of the Polluter-Pays Principle and, consequently, the purpose of the ELD. There is the obvious criticism that, strictly, the actual polluter does not pay, or more accurately, does not pay in full, given that there is no attempt to equate the compensation paid to the fund accurately against the actual cost of remediation. This said, in its Green Paper, the European Commission believed such funds, when financed by contributions from those industries most closely linked to the relevant environmental damage, would represent concrete applications of the Polluter-Pays Principle (European Commission, 1993[3]). A fund will breach the principle where it "subsidised" an operator's prevention or remediation costs or met claims for bodily injury or property damage caused by their activities (European Commission, 2013[13]). Such subsidisation may be deemed to occur where the polluter did not bear the full cost of the damage caused, and any deficit between the polluter's contribution to the fund and the cost of damage was borne by other contributors to the fund. As we have seen, in Moldova, the monetary cost of damages that economic entities are required to pay, such as in the event of their exceedance of "limits", does not reflect the real damage caused to the environment. This means that as they are not bearing the full cost of that damage then there is not a meaningful application of the policy underpinning the principle.

The continued utilisation of the Fund, and its deemed compatibility with the principle, may, however, be less contentious if Moldova were to depart from the focus on compensation and enhance its laws so as to ensure that polluters undertake appropriate remediation, along the lines set out in Annex II of the ELD. In such circumstances the Fund would be less prominent. Though, it may be appropriate to maintain its existence for issues, such as air pollution, soil pollution and erosion, not covered by the ELD.

## The Implementation Experience of Select EU Member States

This section sets out how select EU Member States, specifically Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia, transposed the ELD into their domestic laws. These Member States were selected as their legal cultures were deemed by the EcoContact NGO to correlate most closely with that of Moldova. This meant that their experience would be of greatest use.

## Table 1.1. Transposition of the ELD in Select EU Member States

| | EU Member State | Nature of Transposing Legislation | Penalties |
|---|---|---|---|
| 1 | Estonia | New, stand-alone Act (the *Environmental Liability Act*), with amendments made to four existing Acts that are issue-specific (e.g., *Water Act*, *Waste Act* and the *Forest Act*). | **Administrative Liability**: as provided for under the ELD.<br><br>**Civil Liability**: claims for property damage and economic loss can be made under a variety of acts.<br><br>**Criminal Liability**: breaches of environmental law subject to criminal sanctions in line with the Environmental Crime Directive. |
| 2 | Hungary | New Act (*Act XXIX of 2007 on amendments to different environmental protection acts in respect of environmental liability*). This is the main act transposing the ELD. It made amendments to four existing Acts, including the country's primary piece of environmental legislation, *Act LIII of 1995 on the General Rules of Environmental Protection* (EPA).<br><br>Four Government Decrees also transposed the ELD. | **Administrative Liability**: EPA contains provisions on obligations such as remedying the damage; and payment of fines in the event of failure to comply with the requirements specified in law and/or official decisions. The fine is to be paid over and above environment-utilisation contribution and the environmental load charges.<br><br>**Civil Liability**: The provisions of the Civil Code that deal with activities that pose an increased hazard to the environment will be applicable.<br><br>**Criminal Liability**: Criminal Code includes three special provisions: damaging the environment, damaging nature and infringement of waste management regulations. |
| 3 | Latvia | Transposed through:<br><br>(i) a new *Environmental Protection Law*,<br><br>(ii) two Regulations, and<br><br>(iii) amendments to the *Environmental Protection Law* | **Administrative Liability**: causing damage to the environment may incur fines of up to LVL 10 000 (approx. EUR 14 230) under the Administrative Penal Code.<br><br>**Civil Liability**: a person who suffers harm has the right to claim compensation from the person who caused it under the Civil Law.<br><br>**Criminal Liability**: up to 20 years' imprisonment under Criminal Code. |
| 4 | Lithuania | Transposed by amending the following *existing* legislation:<br><br>(i) *Law on Environmental Protection*, the country's overarching framework environmental law *(NOTE: ambiguities as to whether ELD has been fully transposed)*; and<br><br>(ii) *Law on State Monitoring of Environmental Protection*. | **Administrative Liability**: none beyond legislation transposing the ELD.<br><br>**Civil Liability**: Environment Protection Act provides for claims for environmental damage caused by unlawful activities.<br><br>**Criminal Liability**: none for environmental damage. |
| 5 | Poland | New, stand-alone Act (*Act on the prevention and remedying of environmental damage*) with amendments to five existing Acts.<br><br>Three Ordinances<br><br>*(Note: Poland repealed some legislation that would have overlapped with the transposing legislation).* | **Administrative Liability**: as applicable under legislation transposing the ELD.<br><br>**Civil Liability**: compensation may be claimed for the reasonable costs of carrying out any activity to remedy environmental damage.<br><br>**Criminal Liability**: fine for breaching provisions of the transposing legislation. |
| 6 | Romania | Transposed through Emergency Ordinance 68/2007 on environmental liability for the prevention and redress of environmental damage. | **Administrative Liability**: as provided for under Emergency Ordinance 68/2007 (as amended) and under a variety of instruments that existed prior to transposition of the ELD. |

| | EU Member State | Nature of Transposing Legislation | Penalties |
|---|---|---|---|
| | | | **Civil Liability**: fines may be payable.<br><br>**Criminal Liability**: if damage leads to serious injuries, two to ten years' imprisonment for intentional damage and three months to two years' if unintentional. For breaches resulting in death, between 10-25 years' imprisonment if intentional and one to five years' if unintentional. |
| 7 | Slovakia | New, stand-alone Act (*Act 359/2007 Coll.*, the 'ELD Act') with amendments to six other Acts | **Administrative Liability**: ELD Act deals with various administrative offences. It details the fines that can be imposed in respect of these.<br><br>**Civil Liability**: liability for damage under Civil Code.<br><br>**Criminal Liability**: liability for environmental damage under Penal Code |

Source: Adapted from (European Commission, 2014[14]) and (Milieu Consulting, 2019[15]).

It is clear from the above that the most common route to transposition adopted by these EU Member States was to adopt a *new* law implementing the requirements of the ELD, in conjunction with (i) making necessary adjustments to existing laws where these, perhaps, overlapped with the new law; and (ii) creating new legislative instruments to provide guidance in relation to novel aspects of the ELD that will not have been a feature of existing laws, i.e., guidance for assessing the significance of environmental damage. Lithuania presented the only example of a Member State that transposed the ELD through making revisions to its existing laws. The danger of such an approach is that the requirements of the ELD may not be implemented in full, i.e., there is the prospect for an implementation "gap".

The strategy of transposing the ELD through a new, dedicated legislative instrument, as opposed to revising existing laws, avoids adjustment of the existing (i.e., pre-transposition) wording of legislation and the difficulties that this may create when considered within the legal culture of a jurisdiction. For example, it will take a real shift in mindset for the drafters of legislation to depart from the idea that environmental damage has been caused upon certain "limits" having been exceeded in contrast to determining this through detailed scientific assessment. We have seen that the culture of Moldovan environmental liability laws is firmly embedded in the payment of compensation for exceeding such limits, with multiple references to this is in Moldova's *Law No. 1515 on Environmental Protection* and the array of instruments which set out methodologies for calculating the requisite payments. The ELD represents a novel means – and, indeed, a real departure from tradition for many nations – of dealing with the prevention and remediation of environmental damage, and attempts to "tinker" with existing domestic laws risk masking the dramatic change in legal culture, specifically in relation to the different types of remediation (primary, complementary and compensatory), that is necessity by a proper transposition of it.

Transposition of the ELD requires much thought as to the role of these limit-setting instruments post-transposition and whether, in fact, there is a desire to maintain their existence. As detailed above, there are quite significant elements of ecological damage that are not covered by the ELD and these instruments could be maintained to fill these regulatory gaps. In the areas where there is overlap with the scope of the ELD, such as in relation to the pollution of soil or water, there will need to be consideration as to their role post-transposition. They could be maintained to facilitate calibration of the level of fines for causing environmental damage. Indeed, Latvia has maintained such a use of fines, something that is not prohibited by the ELD.

## Recommendations

The safest, most straightforward and recommended means of implementing the ELD into Moldovan law would be to enact a new, stand-alone law that directly transposes the requirements of the ELD (Option 1). This was, for instance, the approach taken by Romania. The recitals to its implementing law indicate that it was necessary to establish a unitary and distinct legislative framework as a failure to do so could result in the maintenance of a legislative vacuum in the field of environmental liability. This is a distinct risk for Moldova if it were to transpose the ELD through amendment of its existing liability laws. These depart significantly from the remediation-focused nature of the ELD and are spread across a range of issue-specific instruments. Each exhibits different thresholds (or "limits") beyond which liability to (i) compensate, and (ii) remediate, arises. In Lithuania, which relied mainly on amending its framework environmental law, there is still uncertainty as to whether the ELD has been transposed fully due, in part, to differences in terminology used.

The alternative for Moldova would be to (i) make amendments to its framework environmental law, *Law No. 1515 on Environmental Protection*, such as in relation to the introduction of new definitions for "environmental damage", specification of the different liability regimes applicable under the ELD (i.e, strict and fault-based liability), and requirements related to remediation, and (ii) for a small number of new instruments to be enacted to deal with aspects of the ELD, such as the criteria to be used when assessing the significance of environmental damage and the designation of high-risk (i.e., Annex III to the ELD) activities (Option 2). Latvia adopted such an approach.

For both Options 1 and 2, article 64 of Moldova's Criminal Code should be revised to specify precisely how "damage" is to be assessed.

# 2 Developing Environmental Damage Assessment Legislation in Moldova

## Existing Methodologies for Damage Assessment in Moldova

There are a range of existing methodologies for damage assessment in Moldova, including:

- The Law on the Payment for Environmental Pollution ***(Law No. 1540 of 25 February 1998)***,
- The Criminal Code of the Republic of Moldova ***(Code No. 985 of 18 April 2002)***,
- The Temporary Provision for the Determination of Damage Caused to the Environment (***Regulation No. 100 of 18 January 2000***),
- The Procedure for Charging Environmental Fees for the Import of Goods Whose Use Pollutes the Environment and for the Packaging of Imported Goods Made of Plastic and/or Tetra-pack ***(Resolution No. 1296 of 20 November 2008)***,
- The Temporary Methodology for Calculating the Damage Caused to the Environment by Violation of Water Legislation (groundwater pollution) (***Resolution No. 1808 of 18 August 1999***),
- Definitions of Damage to Soil Resources (***Instruction No. 383 from 08 August 2004***), and
- Assessment of Damage Caused to the Natural Environment in Conditions of Non-Compliance with the Legislation on Subsoil (***Instruction No. 385 from 08 August 2004***)

These set out the method of calculating the damage caused to *particular* aspects of the environment by violation of specified environmental standards, with soil and sub-soil a focus. There are not, however, methodologies in place for all of the types of natural resources covered by the ELD, such as protected species and natural habitats and the full range of water types.

These methodologies vary in their length, level of detail provided and their complexity. However, they exhibit three key limitations. The first is their focus is on the fact that damage caused to the environment is to be "compensated" by economic agents, other legal entities and individuals who conduct economic activity on the territory of Moldova. The methodologies are, therefore, geared towards establishing the *monetary* figure to be paid in terms of compensation as opposed to establishing the level of "significance" of the damage caused, the latter being the focus of damage assessment under the ELD. Indeed, the methodologies are applicable to all levels of damage to the environment and are not restricted to exceedance of a specific threshold (i.e., "significant" damage). Furthermore, Moldovan law often requires the funds received from compensation for damage caused to the environment to be transferred to the National Ecological Fund (NEF) (see e.g., ***Regulation No. 100***). This, as we have seen, is an approach prevalent in Moldova but which is not consistent with the basis on which the ELD is built, specifically the Polluter-Pays Principle.

The second is that the cost of damage in most instances is assessed on the basis of equations/formulas, as opposed to technical assessment based on measurable data demonstrating movement from "baseline condition" as required under the ELD. The formulas are theoretical in nature, meaning that they cannot capture the appropriate level of remediation required to redress the damage caused to the environment and the services it provides. This results in a simplified assessment which does not require experts to collect data and conduct assessments in the objective, scientific fashion required under the

ELD. To draw upon an example from the methodology relating to soil pollution, the amount of damage is to be determined on the basis of costs for the total amount of work to clean up contaminated soils (see ***Regulation No. 100 on the Temporary Provision for the Determination of Damage Caused to the Environment***). However, in the case where it is impossible to determine these costs, the amount of damage is calculated by a formula. The issue is that difficulty in determining these costs – and there will be difficulties with this if data or expertise is lacking – may result in the formula being used in the first instance rather than as a "back-up".

The third is that not only is there little, if not no, detail provided on the appropriate forms of (primary) remediation that are necessary to address the damage that has been caused, Moldovan law does not deal with the need for complementary or compensatory remediation which are two crucial aspects of the legal framework implemented by the ELD. As we shall see later in this report, the need to accommodate these two innovative forms of remediation necessitates the use of a damage assessment technique termed "Equivalency Analysis". This technique is not referenced at all in the existing damage assessment methodologies in Moldova, exposing a significant gap in the context of the proposed transposition of the ELD.

## Environmental Damage Assessment: Implications and Key Terms

### *Implications of a "positive" assessment*

The assessment of "environmental damage" is central to the ELD. If an assessment indicates that damage has been caused, or there is a threat of it, operators must take certain measures:

- Where environmental damage *has not yet* occurred but there is an imminent threat of it, operators must take the necessary preventive measures without delay.
- Where environmental damage *has* occurred, operators are required to:
    - take "all practicable steps to immediately control, contain, remove or otherwise manage the relevant contaminants and/or any other damage factors in order to limit or to prevent further environmental damage and adverse effects on human health or further impairment of services" (article 6(1)(a)) ("immediate management of damage factors"); and
    - take appropriate remedial measures (article 6(1)(b)), with Annex II of the ELD providing detailed guidance on the identification of such measures.

The duty to undertake an assessment of the significance of the damage and determine which remedial measures should be taken rests, first and foremost, with the competent authority (article 11(2)). It is, however, entitled to require the relevant operator to carry out its own assessment and to supply relevant information and data as necessary. However, as operators must prevent damaging occurrences without delay and immediately manage damage factors, they may be required to take the initiative and identify damaging factors on their own accord.

### *Key Terms*

It may be prudent at this stage to define some terms that underpin the assessment process:

**"Damage"** means "measurable adverse change in a natural resource or measurable impairment of a natural resource service which may occur directly or indirectly" (article 2(2)).

**"Natural resource"** means "protected species and natural habitats, water and land" (article 12(2)).

**"Services"** and **"natural resource services"** mean "the functions performed by a natural resource for the benefit of another natural resource [e.g., surface water may support protected species of wild bird] or the public" [e.g., land for food production] (article 2(13)).

**"Baseline condition"** means the "condition at the time of the damage of the natural resources and services that would have existed had the environmental damage not occurred, estimated on the basis of the best information available" (article 2(14).

## *Key Concepts*

### *Reference Concepts*

The definition of "environmental damage" set out in article 2(2) (and in Annex I of this Report) uses several "reference concepts" for each category of natural resource.

Their function is to provide: (i) parameters and criteria to examine the *relevance* of adverse effects; and (ii) elements in respect of which effects are to be *measured*. If the reference concepts do not cover an adverse effect (or effects) that has been caused by an activity, then the ELD will not apply. In this case, the matter would be left to the EU Member State's domestic law. The "reference concepts" are:

- **Protected species and natural habitats**: "reaching or maintaining the favourable conservation status" of these habitats or species,
- **Water**: the "ecological, chemical or quantitative status or the ecological potential" of waters under the Water Framework Directive (WFD) and "environmental status" of marine waters under the Marine Strategy Framework Directive (MSFD), and
- **Land**: risks to "human health".

### *'Significant' and 'Significantly'*

The definition of "environmental damage" in article 2(1) contains a further qualification: the "significance" threshold. The words "significant" (articles 2(1)(a) and (c)) or "significantly" (article 2(1)(b)) appear in relation to each natural resource. Furthermore, according to the definition of "environmental damage", the ELD only requires measures to be carried out if the adverse effects are assessed as "significant" in terms of these reference concepts. As detailed in Section 3 below, determination of this is a "matter of 'objective, technical assessment based on measurable data'' as opposed to "arbitrary, subjective opinions" (European Commission, 2021[9]). Where "time-critical", such as may be the case where damage has been caused to the environment and a decision must be made quickly on how best to respond in order to avoid the damage worsening, the assessment must be undertaken with rapid judgment, drawing upon "existing and immediately accessible information" (European Commission, 2021[9]).

It is clear from the definition of "damage" in article 2(2) that it will only apply where the adverse change and impairment is "measurable". This means that the damage must be "capable of quantification or estimation" and that the position *before* and *after* a damaging occurrence "must be capable of being meaningfully compared" (European Commission, 2021[9]). In relation to the measurement of the situation before, the concept of the "baseline condition" comes into play. While this could be constant, it is more likely that it may vary over time (e.g., as may be the case with a seasonal lake). When determining whether "damage" has been caused (i.e., whether there has been a "measurable adverse change" in a natural resource or "measurable impairment" of a natural resource service), the difference between the situation of the natural resource or service after the damaging occurrence and the baseline condition is the focus.

## Determination of the "Significance" of Environmental Damage

### *"Damage to protected species and natural habitats"*

#### *Overview*

The concept of significance for this natural resource is expressed in terms of damage having "significant adverse effects on reaching or maintaining the favourable conservation status" of protected species and natural habitats. The term "favourable conservation status" is defined in article 2(4) of the ELD. The definition of "damage to protected species and natural habitats" is closely linked to provisions of the Birds Directive and the Habitats Directive.

#### *The determination of significance*

The definition of damage to protected species and natural habitats requires that significance is assessed with reference to the baseline condition, "taking account of" the criteria set out in Annex I of the ELD, including (i) by reference to the conservation status at the time of the damage; (ii) the services provided by the amenities they produce; and (iii) their capacity for natural regeneration. In undertaking the assessment, the baseline condition utilised will relate to the *specific* area or the *specific* species population or populations concerned by the adverse effects, with the best information available used. Whilst it may be more challenging to determine the baseline condition *ex post* where damage has occurred, the definition of "baseline condition" provides that it is to be "estimated", conferring scope to cater for this uncertainty.

According to Annex 1 of the ELD, significant adverse changes to the baseline condition should be determined by means of measurable data, such as:

- the number of individuals, their density or the area covered,
- the role of the particular individuals or of the damaged area in relation to the species or to the habitat conservation, the rarity of the species or habitat,
- the species' capacity for propagation, its viability or the habitat's capacity for natural regeneration,
- the species' or habitat's capacity, after damage has occurred, to recover within a short time, without any intervention other than increased protection measures, to a condition which leads, solely by virtue of the dynamics of the species or habitat, to a condition deemed equivalent or superior to the baseline condition.

Damage with a proven effect on human health *must* be classified as "significant".

Annex I of the ELD provides examples of adverse effects that do *not* have to be classified as significant damage, such as negative variations that are smaller than natural fluctuations regarded as normal for the species or habitat in question. These may be considered instances of "*non*-significant damage", which may not be deemed to meet the threshold of "environmental damage" for the purposes of the ELD. This means that the ELD would not apply to them.

For the purposes of remedial measures in respect of **natural habitats**, adverse changes will be significant, and impairments will arise if, in respect of the area of natural habitat affected, they result in *one or more* of the following:

- a measurable permanent or interim loss of the area covered by the habitat,
- a measurable deterioration in respect of the structure or functioning of the habitat,
- a measurable permanent or interim reduction of the range of the habitat,
- a measurable permanent or interim loss of typical species, or a reduction in their range or available habitats,

- a measurable permanent or interim impairment of natural services linked to the area, structure, and functions of the natural habitat and its typical species, and
- a measurable gap between the time when the adverse effects occur and the time when, for the area, structure, functions and typical species concerned, the baseline condition is restored.

For the purposes of remedial measures in respect of a **protected species**, adverse changes will be significant, and impairments will arise if, in respect of the population affected, they result in *one or more* of the following:

- a measurable permanent or interim population loss (including the loss of a specimen or specimens) or deterioration in the health of a population which affects population dynamics in the area where the adverse effects occur,
- a measurable permanent or interim reduction in the range of species concerned,
- a measurable permanent or interim reduction in habitats available to the species concerned for its long-term maintenance,
- a measurable permanent or interim impairment of natural services linked to the population loss, range reduction or reduction in available habitats, and
- a measurable gap between the time when the adverse effects occur and the time when, for the population, extent of its range (i.e., area where the species can be found), and availability of habitats, the baseline condition is restored.

### *"Water Damage"*

The term "water damage" refers to two categories of waters: those concerned under the WFD (i.e., inland surface waters, transitional waters, coastal waters and groundwater), which are covered in section 4.2.1; and marine waters under the MSFD, which are covered in 4.2.2. The significance of adverse effects should be assessed with reference to the "baseline condition". Whilst that phrase is not included in the definition of water damage in article 2(2)(b), the definition of "baseline condition" in article 2(14) covers all natural resources and services, i.e., it covers water. The assessment of the significance of water damage should relate to the *specific* area or areas of waters adversely affected.

#### *Waters Concerned under the Water Framework Directive*

##### Overview

Under this category, certain sub-classes of **"waters"** must be distinguished for the purposes of assessing the significance of damage:

- groundwaters
- rivers
- lakes
- transitional waters (i.e., a body of surface water near the mouth of a river that is partly saline in character but substantially influenced by freshwater flows)
- coastal waters; territorial waters, and
- artificial and heavily modified water bodies.

Assessment of the significance of damage caused to them is achieved through utilisation of **reference concepts** for adverse effects. These comprise the "***ecological*** [for surface waters], ***chemical*** [for surface waters and groundwaters] and/or ***quantitative status*** [for groundwater] and/or the ***ecological potential*** [for heavily and artificially modified water bodies]" *as defined under the WFD*, of the waters concerned. As there are differences between the chemical status for surface waters and groundwaters, this means that there are five separate kinds of status that may have to be considered in a damage assessment. The varied nature of the reference concepts indicates that a range of techniques and methodologies may be used to estimate and measure both the baseline condition and adverse changes

and impairments, including chemical analyses, habitat evaluation, toxicity measurements and bio-indices (European Commission, 2021[9]). The reference concepts are defined in detail in the WFD and will not be defined in this report.

#### The determination of significance

For the purposes of **preventive measures** and **measures to immediately manage damage factors**, a determination of significance should be made if the assessment results – or ought to result – in a reasonable belief that, without such measures, adverse changes and related impairments of the kind mentioned below will result (European Commission, 2021[9]).

The European Commission has made clear that for the purposes of remedial measures, adverse changes will be deemed to be significant if, in relation to the area(s) of the affected water bodies, those changes result in a measurable:

- permanent or interim loss in respect of a status element (as detailed in Annex V of the WFD) such that, for that status element, the area of water affected no longer shows the status element characteristics that would have been present in that area before the adverse change or impairment,
- deterioration in respect of a status element such that, for that status element, the area of water affected no longer shows the status element characteristics that would have been present in that area before the adverse change or impairment took effect,
- impairment of natural services linked to the status elements that have suffered loss or deterioration, and
- gap between the time when the adverse effects occur and the time when, for the status elements concerned, the baseline condition is restored (European Commission, 2021[9]).

Whilst the adverse effect need not result in a change of classification for purposes of the WFD (e.g., a movement from “good” to “moderate” ecological status for rivers) a change to a lower status classification would be an example of a significant adverse effect. There are no criteria, as provided in Annex I for assessing and determining the significance (or non-significance) of “damage to protected species and natural habitats”, for water damage.

### *Marine Waters Concerned under the Marine Strategy Framework Directive (MSFD)*

#### Overview

As per article 3(1) of the MSFD, the definition of “marine waters” that it uses overlaps with that of “coastal waters” as defined in the WFD. The MSFD applies to these in so far as particular aspects of the environmental status of the marine waters are not already addressed through the WFD or other EU legislation. There is also an overlap with the coverage of “territorial waters” as referred to in the WFD, which applies whenever the damage concerns chemical status. The reference concept for adverse effects on “marine waters” is their “environmental status”, as defined in the MSFD.

#### The determination of significance

The significance of the adverse effects is to be determined on the basis of the baseline condition and relevant measurable data on adverse changes and related impairments. For the purposes of **remedial measures**, the European Commission indicates that adverse changes will be significant if, in respect of the area or areas of marine water affected, they result in a measurable permanent or interim loss in respect of the status of a qualitative descriptor in conjunction with the indicative list of characteristics, pressures and impacts, by taking account of “criteria elements” and “threshold value”, as provided for under the MFSD such that the area of marine water affected no longer conforms to the environmental status that would have applied to that area before the adverse change took effect (European Commission, 2021[9]).

Whilst the adverse effect need not result in a change of classification (e.g., a change from "good environmental status", as defined in article 3(5), to an environmental status that is not good) for purposes of the MSFD a change to a lower status classification would be an example of a significant adverse effect. Further deterioration of "good environmental status" will also be considered as a significant adverse effect. Finally, any assessment and determination of significant adverse effects under the ELD needs to consider whether a damaging occurrence affects any "marine protected areas" as stricter biodiversity conservation requirements apply to these.

### *"Land Damage"*

#### *Overview*

The assessment of land damage relates to the *risk* of "human health" (not the environment) being adversely affected; actual harm need not be shown. The assessment is concerned with whether the risk is "significant". The significance of the risk is assessed based on the known hazards and level of human exposure to contaminants. Whilst "land" is not defined, as article 2(1)(c) refers to "in, on or under land", it extends to both the surface and the sub-surface of land. Thus, soil is captured by the definition. It may also be appropriate to consider the potential for water damage, specifically pollution of groundwater, in the event of instances of land damage as these forms of pollution have the potential to be closely connected.

#### *The determination of significance*

In determining the significance of "land damage", Annex II.2 of the ELD states that matters to be taken into account with regard to the presence of the risk include: the characteristics and function of the soil, the type and concentration of the harmful substances, preparations, organisms or micro-organisms (i.e., their *specific* risks and possible exposure routes, such as dermal contact or consumption), and the risk and the possibility of their dispersion.

For **preventive measures** and **measures to immediately manage damage factors**, the risk will be "significant" if there is reasonable doubt as to the absence of a measurable possibility that an imminent threat or damage factors may cause human beings to be directly or indirectly exposed to contaminants to an extent that is harmful to their health (European Commission, 2021[9]). Whilst for **remedial measures**, it will be "significant" if there is reasonable doubt as to the absence of a measurable possibility of substances, preparations, organisms or micro-organisms directly or indirectly introduced in, on or under land causing human beings to be directly or indirectly exposed to the contaminants to an extent that is harmful to their health (European Commission, 2021[9]). While the definition of "baseline condition" relates to all three natural resources and their services, it is of limited use for assessing the significance of land damage (i.e., the risk to human health). This is because when it comes to remediation of land damage the ELD requires that any significant risk to human health is removed as opposed to requiring restoration of the land to the condition it was in before contamination.

## Natural Resource Damage Assessment (NRDA)

### *Introduction*

NRDA is a process which emphasises the use of *remediation measures* following environmental damage to offset the loss of natural resources and the services that they provide, as opposed to seeking to collect monetary damages from the polluter in respect of that damage. As we detailed in Chapter 1, the latter is a central characteristic of the process of damage assessment used in Moldova's environmental liability laws.

Under the ELD, where an operator's activities caused environmental damage, the operator will be required to remediate the environment *and* compensate the public for the natural resources/services

which were lost during the period in which the environment was impaired. This “compensation” is resource- or service-based, *not monetary*. A process termed “equivalency analysis”, the key steps of which are set out in Annex C of this report, is used by competent authorities to determine the type and amount of: (i) natural resources and services lost over time as a result of the damage; and (ii) complementary and compensatory remediation needed to offset that loss. It seeks to ensure that polluters neither under-compensate nor over-compensate for losses, thereby facilitating respect for the Polluter-Pays Principle. The focus of equivalency analysis is upon determining the extent of *complementary* and/or *compensatory* remediation to be undertaken by the operator.

To be clear, equivalency analysis does not seek to determine what primary remediation should be undertaken (Lipton et al, 2018[16]). Under the ELD, the obligation is upon the operator to identify, in accordance with Annex II, potential remedial measures (including those intended to facilitate primary remediation) and submit these to the competent authority for approval (article 7(1)). This is unless the competent authority has already taken action itself. This said, quantification of the benefits of primary remediation *with a view to determining any residual damage* ripe for complementary and/or compensatory remediation is a key input into an equivalency analysis. Equivalency analysis is merely one step in the process of deciding how remediation ought to proceed after damage has occurred as there may be other site and incident-specific considerations that relevant stakeholders may wish to consider in determining the level of remediation required to offset the damage (Lipton et al, 2018[16]). Annex II makes clear that if it is not possible to use resource-to-resource or service-to-service equivalence approaches, then alternative valuation techniques (e.g., monetary valuation), as prescribed by the competent authority, shall be used. The strengths and weaknesses of different equivalency analysis methods are set out in Annex D of this report.

### *Equivalency Analysis: Methods*

There are three main methods of equivalency analysis: service-to-service, resource-to-resource and value equivalency. Prior to examining these, core common terms will be outlined:[1]

- **Debit**: an expression of the quantity of *loss* suffered as a result of the environmental damage; it may be multidimensional as the damage may have negative effects on a number of different species, habitats, ecosystem functions, and human values.
- **Credit**: an expression of the natural resource or service *benefit* gained through complementary and compensatory remediation.
- **Metric(s)**: one or more *measurements of loss*, usually determined in close consultation with relevant environmental scientists, which serve as indices of keystone natural resources or services subject to damage. The same metric must be used to express the total damage (debit) and the benefit of remediation (credit).
- **Scaling**: the process whereby the expected amount of benefit (i.e., credit) generated from the remediation is made to *equal* the debit, when quantified in terms of the same metric. Scaling has three broad steps: (1) quantification of the total debits caused by the damage; (2) quantification of the credit expected per unit of remediation (e.g., improvement in habitat services per hectare of remediated land); and (3) division of the total debit by the unit credit to determine the total amount of credits (i.e., remediation) needed to offset the loss (Lipton et al, 2018[16]).
- **Discounting**: this process ensures that debits (losses from damage) and credits (gains from remediation) that necessarily occur at different points in time can be compared on an equal footing, i.e., their present-day value. Services gained from remediation conducted in the future are less valuable to the public than services available today (Chapman and LeJeune, 2007[17]). The services available today can be used to generate further benefits which would be given up if those services were unavailable until later year(s). The choice of the discount rate, which is

[1] The definitions are taken from the ELD Training Handbook.

used to bring future values to present terms, is informed by the academic literature. Some Member States have official rates.

### *Service-to-service*

With this method, also known as Habitat Equivalency Analysis (HEA), losses are expressed in terms of habitat and are offset by remediation of similar habitat (Lipton et al, 2018[16]). The underlying assumption is that equivalent habitats provide equivalent services and so years of lost services can be compensated for by the provision of acres of additional habitat. This particular form of equivalency analysis is intended for use when the service losses arising from the pollution incident are primarily *ecological* and not direct human use (e.g., recreation) (Desvousges et al, 2018[18]). Services to ecosystems and other ecological resources include habitat for food, shelter, and reproduction; organic carbon and nutrient transfer through the food web; biodiversity and maintenance of the gene pool; and food web and community structure (Chapman and LeJeune, 2007[17]). In HEA, the basic unit of measurement is, typically, a discounted-service-acre-year (DSAY). This represents the value of all of the ecosystem services provided by one acre of the habitat in one year. Once calculated, remediation measures are selected that would adequately offset these DSAYs in the form of acres of remediated habitat.

### *Resource-to-resource*

This method, also known as Resource Equivalency Analysis (REA), is fundamentally the same as HEA. However, crucially, the units of quantification differ with losses being expressed in terms of *resource units* (e.g., numbers of fish or birds) rather than habitat (Lipton et al, 2018[16]). The method tries to match the lost resources with new ones. For this to work, it is essential to determine with precision which organisms are lost following a particular impact and which are gained by remediation (OECD, 2012[11]). The method may be more appropriate than the service-to-service approach where the pollution incident has had a significant effect on *particular* animals or plant populations (OECD, 2012[11]). It is more common for HEA to be used for damage assessments (Desvousges et al, 2018[18]).

### *Value Equivalency*

The underlying premise of techniques which fall under this category is that damage to natural resources and the services that they provide can be measured in *monetary terms* and compensated for in terms of physical resource and service provision (Lipton et al, 2018[16]). Under the **value-to-cost** version, the monetary assessment of the damage ensuing from the incident is set as the budget for remediation, *the actual benefits of which are not estimated directly* (Eftec and Stratus Consulting, 2013[19]). It ensures equivalence between the debits and credits by assuming that the cost of remediation equals the total debit. This approach may be appropriate where it is possible to estimate the monetary value of the damage but not to estimate the monetary value of the benefits of remediation. Under the **value-to-value** version, both the value of damage and the benefits from remediation are measured in monetary terms (Eftec and Stratus Consulting, 2013[19]). It ensures equivalence between the debits and credits by assuming that the requisite amount of remediation is based on the increase in value *derived from/provided by* the proposed remediation project rather than on the value of the damage. Whilst compensation may be measured (or scaled) in monetary terms, compensation under the ELD can only be provided in resource-based units, *not money*.

Monetary values are based on individuals' preferences for given *changes* in the quality and/or quantity of resources of service (Chapman et al, 2018[20]). There are two means of measuring preference: (i) individuals' willingness to pay (WTP) money to avoid an environmental loss or secure a gain; or (ii) their willingness to accept money as compensation (WTAC) to tolerate an environmental loss or to forgo a gain (Chapman et al, 2018[20]). Whilst environmental values which depend upon people's actual use of the environment are referred to as *use* values, those which derive from people's contentment from knowing that environmental resources are preserved even if they do not directly use or interact with them, nor ever will, are referred to as *non-use* or *existence* values (Hanley, 2002[21]). Reductions and gains in *use* and *non-use* values will be included in the debit and credit estimates in equivalency analysis

conducted in relation to environmental damage (Chapman et al, 2018[20]). As these types of values are often not priced in the market, two broad techniques have emerged which can be invoked to determine appropriate monetary values for the equivalency analysis:

**Revealed preference techniques**

These use information about people's *actual* behaviour in markets related to the resources or services being valued to estimate value (Chapman et al, 2018[20]). There are two main methods:

- **Travel cost:** this method estimates economic values associated with ecosystems or sites that are used for *recreation* by assuming that the value of the site is reflected in how much people are willing to pay to travel to visit it (OECD, 2012[11]). Such costs include costs of transport, accommodation, spending on food and drink and recreational activity (Chapman et al, 2018[20]). This is then used as a proxy for a market price (Chapman and LeJeune, 2007[17]). Thus, for instance, individuals' WTP to visit the site can be estimated based on the number of trips that they make at different travel costs.
- **Hedonic analysis:** this method is used to estimate economic values for environmental services that *directly affect* market prices, such as housing prices (OECD, 2012[11]). This technique reflects the understanding that the value for a good can be divided into component parts (Chapman and LeJeune, 2007[17]). For example, all else held equal, a home near a polluted site will cost less than one far away from it. The difference in housing price affords an estimate of the loss in value flowing from the pollution (OECD, 2012[11]). This could be expressed as the value remediation must create to compensate the public for the pollution (Chapman and LeJeune, 2007[17]).

**Stated preference techniques**

Stated preference methods use questionnaires to elicit the respondents' WTP for the provision/conservation of a given environmental asset directly or WTAC for the loss of an environmental asset (OECD, 2012[11]). Hypothetical markets are presented to a representative sample of the population affected by these changes (Martin-Ortega, 2011[22]). Answers reflect intentions rather than actual behaviour. There are two main survey-based methods for the valuation of non-market resources (Chapman and LeJeune, 2007[17]):

- **Contingent valuation method (CVM)**: individuals are questioned directly about how they value the prevention of a specific environmental damage and the implementation of proposed restoration projects.
- **Conjoint Analysis:** individuals are questioned about how they value the prevention of a specific environmental damage and the implementation of proposed restoration projects but they are given more choices than under CVM.

### *Equivalency Analysis and the ELD*

Annex II of the ELD states that resource-to-resource or service-to-service equivalence approaches "should be considered first" to determine the scale of *complementary* and *compensatory* measures to remediate damaged water or protected species or natural habitats (Annex II, para 1.2.2). It is to be noted that, according to Annex II, complementary and compensatory remediation is not applicable in relation to land damage. The section then goes on to state that if their use is not possible, alternative valuation techniques are to be used (e.g., monetary valuation). Should monetary valuation techniques need to be utilised, the ELD expresses a preference for value-to-value over value-to-cost approaches (Annex II, para 1.2.3). This suggests that there is perceived to be greater potential for accuracy in the determination of the scale of appropriate complementary and compensatory measures where it possible to estimate *both* the monetary value of the damage and the remediation benefits. The competent

authority is permitted to prescribe the method to be used. This means that there is significant discretionary space for the competent authority to determine which approach is to be utilised.

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# Annex A. Summary of Acts and Instructions on Issues Relating to Environmental Liability in the Republic of Moldova

A variety of other legal instruments have a direct bearing on environmental liability, including:

**Law No. 1540 of 25 February 1998 on the payment for environmental pollution** applies to all legal entities and natural persons engaged in pollution creating activities. It sets thresholds for payment of sums for (i) emission of pollutants into the atmosphere by stationary sources; (ii) discharge of pollutants with sewage into water bodies; (iii) discharge of pollutants into reservoirs, filtration fields and slurry collectors of livestock waste; and (iv) certain products whose use pollutes the environment. It details the means of calculating the requisite payment which is to be made by the regulatee to the state budget.

**Regulation 100 of 18 January 2000 on the temporary provision for the determination of damage caused to the environment** sets out the procedure and method of calculating the damage caused to the environment, specifically land resources and subsoil, through the violation of environmental standards (i.e., 'limits'). It applies to accidental and prolonged 'unauthorized' releases of pollutants. Liability for damages do not exempt the perpetrators from responsibility for implementing measures to protect the environment. Compensation recovered is to be transferred to the Fund. Sums collected as compensation are to be used to, for example, perform work on the conservation and restoration of soils.

**Instruction No. IMM383/2004 of 8 August 2004 for determining damage to soil resources** defines the procedure (mainly equations) for calculating the damage caused to soil resources due to the burning of plant residues, erosion and chemical pollution. Damage is understood as the loss of natural resources and the costs, expressed in national currency, necessary to compensate and restore losses caused to the state or components of the environment (lithosphere, hydrosphere or atmosphere). There are two ways to calculate the requisite monetary payment: (i) the costs of the total amount of work to clean up contaminated soils; and (ii) when it is impossible to determine (i), the calculation is to be based on a formula.

**Instruction No. IMI385/2004 of 8 August 2004 on the assessment of damage caused to the environment in the conditions of non-compliance with subsoil legislation** defines 'damage' as the 'loss of material, financial, labor and other natural resources belonging to the state or the owner of the subsoil, interfering with their rights to carry out a certain type of activity'. The damage (or compensation) is calculated according to a formula. Liability to compensate does not release the guilty person (legal or natural) from the obligation to carry out measures to eliminate the consequences that provoked the damage.

**Resolution No. 1808 dated 18 August 1999 on the temporary methodology for calculating the damage caused to the environment by violation of water legislation (groundwater pollution)** states that 'damage', which can be direct (e.g., disabling water supply sources) or indirect (e.g., a decrease in the life expectancy of animals), is defined as 'losses of material, moral, labor, financial and natural resources associated with the need to eliminate negative consequences caused by violation of water legislation'. The level of compensation is calculated according to a formula. This will reflect factors such as the cost of treatment of the patient in a medical hospital, and loss of salary in the case of direct damage. Liability to compensate does not relieve the guilty person of the need to carry out work to restore the quality of groundwater.

# Annex B. Definition of “environmental damage” under the EU ELD

Article 2(1) of the ELD defines “environmental damage” as:

*“**(a) damage to protected species and natural habitats**, which is any damage that has significant adverse effects on reaching or maintaining the favourable conservation status of such habitats or species. The significance of such effects is to be assessed with reference to the baseline condition, taking account of the criteria set out in Annex I;*

*Damage to protected species and natural habitats does not include previously identified adverse effects which result from an act by an operator which was expressly authorised by the relevant authorities in accordance with provisions implementing Article 6(3) and (4) or Article 16 of Directive 92/43/EEC or Article 9 of Directive 79/409/EEC or, in the case of habitats and species not covered by Community law, in accordance with equivalent provisions of national law on nature conservation.*

***(b) water damage**, which is any damage that significantly adversely affects:*

*(i) the ecological, chemical or quantitative status or the ecological potential, as defined in Directive 2000/60/EC, of the waters concerned, with the exception of adverse effects where Article 4(7) of that Directive applies; or*

*(ii) the environmental status of the marine waters concerned, as defined in Directive 2008/56/EC, in so far as particular aspects of the environmental status of the marine environment are not already addressed through Directive 2000/60/EC. (80)*

***c) land damage**, which is any land contamination that creates a significant risk of human health being adversely affected as a result of the direct or indirect introduction, in, on or under land, of substances, preparations, organisms or micro-organisms.”*

# Annex C. Key Steps in Conducting an Equivalency Analysis

In general, conducting any type of equivalency analysis will entail five fundamental steps (the following is taken from the ELD Training Handbook (2013):

**Step 1: Preliminary evaluation**

- Describe the incident
- Identify and describe affected locations, environments, habitats, and species
- Identify the nature, degree, spatial and temporal extent of environmental damages incurred or anticipated
- Identify potential social, economic and transboundary issues
- Begin evaluation of additional assessment actions: potential need for complementary and compensatory remediation; types and hierarchy of equivalency methods; types of data necessary to undertake assessment
- Evaluate benefits of primary remediation
- Determine the appropriate scale of the assessment (e.g., in terms of the area covered)

**Step 2: Determine and quantify damage (the debit)**

- Identify damaged resources, habitats and services
- Determine causes of damage
- Quantify damage
- Calculate interim loss and total debits

**Step 3: Determine and quantify gains from remediation (the credit)**

- Identify and evaluate potential remediation options
- Calculate gains (credits) of remediation options
- Deal with uncertainty and variable outcomes of equivalency analysis

**Step 4: Scale the complementary and compensatory remediation actions**

- Calculate per unit gains (credits)
- Scale remediation
- Estimate costs of remediation options
- Consider if costs are disproportionate

**Step 5: Monitor and report**

- Remediation planning and implementation
- Monitor the remediation success
- Report

# Annex D. Equivalency Methods: strengths and weaknesses

The following table sets out the strengths and weaknesses of the different methods of equivalency methods discussed above. Owing to the fact that service-to-service and resource-to-resource approaches are conceptually similar (Lipton et al, 2018[16]), they are analysed together.

| | Measure | Characteristics | Strengths | Weaknesses |
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| 1 | **Service-to-service**<br><br>(also known as Habitat Equivalency Analysis (HEA))<br><br>and<br><br>**Resource-to-resource**<br><br>(also known as Resource Equivalency Analysis (REA)) | **HEA**<br><br>Losses are expressed in terms of habitat and are offset by remediation of similar habitat. The underlying assumption is that equivalent habitats will provide equivalent services and so years of lost services can be compensated for by the provision of acres of additional habitat.<br><br>**REA**<br><br>Whilst fundamentally the same as HEA, the units of quantification differ with losses being expressed in terms of resource units (e.g., numbers of fish or birds) rather than habitat. | • Avoids the need to quantify lost natural resources and services in monetary terms (and the controversy and methodological difficulties associated within this).<br>• Of greatest use when the service losses are primarily ecological; such losses are difficult to quantify in monetary terms.<br>• Useful when the services provided by the replacement habitat/resource are ecologically similar to those provided by the natural resources damaged by the pollution incident.<br>• HEA can reflect the variability and complexity of ecosystems in a way in which Value Equivalency Analysis (VEA) cannot.<br>• Where the natural resources and services damaged can be identified with ease and remediation through provision of equivalent habitat/resources is possible, HEA/REA is likely to be more effective than VEA in determining with accuracy the appropriate degree of compensatory remediation for service losses.<br>• When a pollution incident has had a significant effect on a particular natural resource (or resources), such as certain animal or plant populations, REA may be considered to be best placed amongst the different equivalency analysis methods to determine appropriate remediation measures.<br>• Where the potential for a polluter to be held liable under the ELD for the costs of undertaking remediation (e.g., for the purpose of pricing insurance coverage) is derived using HEA/REA then this is perceived to be easier to absorb for | • The methods do not factor in human welfare considerations to the analysis; these may be viewed as important and relevant following damage to the environment from a pollution incident.<br>• The methods assume that the public's loss of utility can be compensated through provision of equivalent habitat/resources. However, HEA/REA are, arguably, of less value than VEA methods where the service losses are primarily human use/social (e.g., recreational) or such losses comprise a not insignificant portion of total losses.<br>• May not be appropriate where the services provided by remediation measures are of a different type or quality than those lost following the pollution incident.<br>• May not be appropriate where the services lost cannot be measured accurately.<br>• Assumes that the public place equal value on the services provided at the site subject to damage and the restored site (where complementary remediation is carried out); this may not be the case owing to certain site specific considerations (e.g., cultural/ethical).<br>• Cannot capture the fact that social values of a site may be heterogeneous so that particular groups may be perceived to incur higher losses than others.<br>• Neither HEA nor REA allow for changes in preference. They assume that the value to society of a given habitat/resource is constant over time. However, there is |

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| | | | the insurance sector than non-market valuation techniques (e.g., revealed preference). This, it seems, goes to the relative unpredictability of the results produced from revealed preference studies. | the argument that increasing development may, for instance, lead to a shortage of certain resources, increasing the value of the loss in the future and rendering damage more costly today.<br>• May not be appropriate where there is difficulty in agreeing a common metric to reflect the services damaged by the pollution incident and those gained through remediation.<br>• Unable to reflect the value of natural resources and services that are irreversibly lost and so non recoverable following a pollution incident (e.g. endangered species and habitats).<br>• As with all equivalency analysis models, a lack of input data (e.g., in relation to the estimated lost utility to, for instance, society as a result of the damage having been caused) limits the validity of the outputs. |
| 2 | Value Equivalency Analysis (VEA)<br><br>(**value-to-cost**: the monetary assessment of the damage ensuing from the incident is set as the budget for remediation, the benefits of which are not estimated directly)<br><br>(**value-to-value**: both the value of damage and the benefits from remediation are measured in monetary terms) | (**travel cost** and **hedonic** methods use 'revealed preference' information about individuals' actual behaviour to estimate value)<br><br>(**contingent valuation method** (CVM) and **conjoint analysis** use 'stated preference' methods to estimate value)<br><br>Monetary values are based on individuals' preferences for given changes in the quality and/or quantity of resources of service.<br><br>There are two means of measuring preference:<br><br>(i) individuals' willingness to pay (WTP) money to avoid an environmental loss or secure a gain; or<br><br>(ii) their willingness to accept money as compensation (WTAC) to tolerate an environmental loss or to forgo a gain. | • Provides a means of measuring the monetary value of natural resources that are not traded in economic markets.<br>• Measures the socio-economic value of ecosystem services, something which HEA/REA are unable to do.<br>• Incorporates the social value of the environment into the decision-making process.<br>• Revealed preference techniques are particularly useful where the pollution incident impacts upon recreational activities.<br>• Hedonic pricing is useful for estimating economic values for changes in environmental quality that directly affect market prices e.g., the value of real estate or timber.<br>• Where remediation of the same/similar resources or services is not technically feasible, undesirable or unreasonably expensive, then VEA might provide a better means of scaling remediation (i.e., ensuring equivalency between the debit and credit) than HEA/REA.<br>• Databases can be built to store evidence of economic value which can not only facilitate quicker and cheaper VEA assessments conducted at a later date, but may be considered particularly helpful where primary economic research cannot reasonably be undertaken.<br>• VEA is useful where the scope of environmental damage following a pollution incident is so large that the use of HEA/REA, and important assumptions which underpin their | • VEA reflects an anthropocentric view of nature (i.e., environment possesses value due to its impact on humans), which can be controversial.<br>• The requisite data/level of data may not always be available at a reasonable cost and within a reasonable time.<br>• Services provided by natural resources are extremely difficult to value in monetary terms and, consequently, the results may be controversial and open to legal challenge.<br>• There may be deemed to be a high degree of artificiality in the results produced by VEA given that the method seeks to value goods and services that are not traded in economic markets; they have no objectively verifiable market value.<br>• Results produced by CVM and the travel cost method can be extremely subjective and unpredictable.<br>• Stated preference approaches can be controversial given that they are based on hypothetical intentions rather than actual behaviour.<br>• Relatedly, stated preference approaches are subject to biases and may generate responses which evidence strategic behaviour by the respondents.<br>• VEA cannot capture cultural or ethical values which people attach to the environment meaning that the |

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| | | | use, are unsupportable.<br>• VEA may be useful where an alternative site benefiting from complementary remediation is located far from the site damaged by the pollution incident. | results may not reflect the total value which people place on changes in environmental quality following a pollution incident.<br>• The particular technical choices (e.g., in relation to the particular market data selected) made by the statistician when undertaking estimates of WTP using revealed and stated preference techniques can have significant impacts upon the eventual outcome of the analysis and, consequently, the extent of 'compensation' required from the polluter. The fact that different choices may be defensible and that there is no 'right' choice may be seen to create a degree of unfairness for polluters.<br>• The level of information provided to survey respondents when using CVM can influence the eventual estimate, leading to important questions as regards the appropriate level of information to be provided. |

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# Developing environmental liability legislation in the Republic of Moldova

The government of the Republic of Moldova is considering revising environmental legislation in the country to increase the liability of polluters for environmental damage.

This report aims to support this process with the experience of the 2004 EU Environmental Liability Directive (ELD), the main law governing environmental liability of polluters in EU countries. It presents the main features of the ELD and the experience of its implementation in select EU Member States, and describes the existing legislation for environmental liability and damage assessment in the Republic of Moldova. The report identifies the main divergences between Moldova's legislation and the principles of the ELD – most notably the Polluter Pays Principle - and recommends how these divergences can be removed.

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