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Chapter 1: Generalities	
1. Scope of application of Act	
1.1 This Act regulates the prevention and remediation of damage caused to the environment based on the polluter pays principle [, including the remediation of damage caused by climate change].	As explained in the introduction, this model law can cover climate change damages where that is the policy objective.
1.2 This Act does not apply to environmental damage or threat of environmental damage caused by: a) an armed conflict, hostilities, civil war or insurrection or an exceptional and inevitable natural phenomenon of force majeure; b) an event or an activity in respect of which liability for environmental damage is regulated by the 1992 International Convention on Civil Liability for Oil Pollution Damage, the 1992 Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage or the 2001 International Convention on Civil Liability for Bunker Oil Pollution Damage and the 2003 Protocol to the 1992 Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage; c) an event or activity in respect of which liability is regulated by the Vienna Convention on Civil Liability for Nuclear Damage or the Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention; d) an activity, the main purpose of which is to ensure international security or an activity, the sole purpose of which is protection against natural disasters; or e) a national defence activity on the prescribed territory and to the prescribed extent.	We recommend this and the following exclusion clause only for those jurisdictions that have transposed into national law the respective international conventions. Alternatively, the respective international conventions can also be referred to just to limit liability, see the example of Subsection 6.6. We have not assessed the question which international convention should be used to limit the scope and which should better be used just to limit liability. It would be unfair to burden the respective activities with the risk of environmental liability. The same applies here.
1.3 This Act applies to environmental damage or threat of environmental damage caused by non-point pollution if it is possible to determine a causal link between the environmental damage or a threat thereof and a person's responsibility for a damaging event or a person's act or omission. **OR** This Act does not apply to environmental damage or threat of environmental damage caused by non-point pollution.	To avoid numerous and difficult legal disputes, it should be clarified whether non-point pollution is covered or not. There is a link to the question whether climate change damages shall be covered or not. It would be inconsistent to cover climate change damages and not cover other forms of non-point pollution.
[1.4 This Act does not apply to environmental damage or threat of environmental damage arising from an event, act or omission occurring after the entry into force of this Act	We recommend the exclusion Subsection at 1.4 and not 1.5 because it offers more environmental protection noting it applies to environmental damage or threat of environmental damage that occurred before

if more than 30 years have passed from the event, act or omission that caused it.] **OR** [1.5 This Act does not apply to environmental damage caused by an event, act or omission occurring after the entry into force of this Act if it is caused by an activity that ended before the entry into force of this Act.]	the law's enactment, retroactive laws can be problematic in some jurisdictions that may avoid retroactive application as a matter of legal policy.
2. Definitions 2.1 'Environmental damage' means: a) substantial adverse effect on reaching or maintaining a favourable conservation status of a habitat or species (hereinafter *damage caused to habitat or species*); b) substantial adverse effect on a protected area, a special conservation area, a species protection site, an individual protected natural object (hereinafter *damage caused to protected area*); c) substantial adverse impact on marine waters, surface water or groundwater (hereinafter *water damage*); d) substantial adverse effect on land, including soil layer (hereinafter *land damage*). [e) substantial pollution of atmospheric air (hereinafter *air damage*)]. 2.2 'Substantial adverse effect' means a measurable adverse change in the quality or quantity of a habitat, species, protected area, water or land (hereinafter *natural resource*) or measurable impairment of the quality or quantity of the functions performed by a natural resource for the benefit of another natural resource or the public (hereinafter *benefits*), which may occur directly or indirectly. 2.3 Clauses a) and b) of Subsection 2.1 do not cover previously identified adverse effects which have been caused by an activity authorised by an administrative authority on the basis of law. 2.4 'Threat of environmental damage' (hereinafter *threat of damage*) means a prevailing / sufficient / noteworthy / more than … (e.g. 30, 40, 50 or 60) % likelihood that environmental damage shall occur in the near future. 2.5 The 'baseline condition' means the status of natural resources and the benefits thereof, which would exist if no environmental damage had been caused. 2.6 A 'person who caused damage' is a person whose act or omission, including the	Regarding the special topic of damage to the air, see the explanatory note at the end of the model law. Liability aspects of air pollution could demand sophisticated regulations by separate laws. See the "Explanatory note 1" at the end of the model law for further details. Please check whether you wish to include clauses c) and d) as well. Please choose the term appropriate in your jurisdiction. See also the presumption in Subsection 4.5 which could alternatively be placed here.

omission to control an event or person under its responsibility, caused environmental damage [or a threat of damage]. 2.7 'Prevention of environmental damage' means the taking of measures to eliminate a threat of damage caused by an event, act or omission or to reduce the extent of possible environmental damage or to control, prevent the spread of, eliminate or otherwise influence the contaminants or other harmful factors in order to limit or to prevent further environmental damage as well as damage to human health or further impairment of the quality of the benefits of the habitat, species, protected area or water (hereinafter *preventive measures*). 2.8 'Remediation of environmental damage' means the taking of measures to restore, replace or compensate for natural resources or the benefits thereof and to eliminate significant risks threatening human health (hereinafter *remedial measures*). 2.9 'Recovery' means achieving the baseline condition of a damaged habitat, species, protected area or water and their benefits in the event of the environmental damage specified in Subsection 2.1, clauses a) to c). Recovery also includes natural recovery. In the event of land damage 'recovery' means the elimination of a potential risk to human, animal or plant health. 2.10 'Interim damage' means environmental damage arising from the fact that a natural resource or its benefit cannot perform its ecological function or provide public benefits or does not support the natural functioning of other natural resources until the restorative or substitutive remedial measures have taken effect. 2.11 'Indirect damage' means any loss of monetised rights or expectation of monetised rights where the expectation is itself monetised, any loss in value and the procedural or legal costs.	Legislators requiring more preciseness may refer to the following: liabilities, monetary obligations, losses, damages, costs and expenses (including all reasonable fees, disbursements and expenses of counsel, experts, or consultants, and costs of investigation and feasibility studies), fines, penalties, sanctions, and interest payments.
3. Identification of environmental damage and threat of damage and baseline condition 3.1 The baseline condition, Subsection 2.1 and Subsections 3.3 and 3.4 shall be taken	For the identification of environmental damage, this model law establishes two starting points: - Some abstract terms,

into account when identifying environmental damage. 3.2 The environmental damage as defined in Subsection 2.1 shall be identified on the basis of the following: the number of specimen; the size of the population and the range of its habitat; the importance of the specimen or damaged area to the population, species, habitat or protected area; threats to the species or habitat at the local, national or continental level; the reproductiveness and viability of the species; natural self-regeneration of the habitat, species and the protected area; the protection objective, the protection regime or the protection category of the habitat, species and protected area; and the benefits of the habitat, species or protected area. 3.3 Environmental damage that has adverse effects on human[, animal or plant] health is deemed to be environmental damage. 3.4 Adverse effects that are smaller than a natural change that is considered normal in the case of the given habitat, species or protected area and that has occurred due to natural factors or in the course of ordinary management, or if the habitat, species or protected area reaches the baseline condition or equivalent or better condition as compared to the baseline condition within a short period of time and without intervention, may not be deemed environmental damage within the meaning of Subsection 2.1 clauses a) and b). [3.5 Environmental damage and a threat of damage is identified by the Environmental Authority or by the claimant of a private law action and subsequently by the court.]	- Concrete parameters or criteria. The starting points are completed by this presumption or interpretative rule. In order to not disproportionately absorb administrative capacities, minimal damages should be excluded. It may also be necessary to define a reference point for “considered normal”, particularly in those habitats, species or protected areas that have suffered damage by tortfeasors that fall outside of the time period of the applicable law. In some if not most jurisdictions, this Subsection is not needed. In case of doubt, keep this clarifying provision.
4. Causation 4.1 A causal link shall be assumed by authorities and courts where the likelihood of a certain event, action or omission causing a certain damage or threat of damage is higher or equal to … (e.g. 80) %. 4.2 When assessing the likelihood of a causal link, the following shall be taken into account: the course of the activity; the premises and the technical equipment used; the nature and concentration of the substances and organisms coming into play; the weather conditions; the time, place and circumstances of the occurrence of the	In order to strike a balance between the justified need for compensation and the risk of making an innocent person liable, a certain likelihood percentage should be established based on the respective jurisdiction’s tradition. For jurisdictions where there is no good national reference, we suggest 80%. Alternatives include: requiring a “prevailing likelihood”, “clearly prevailing likelihood” or “full certainty” / “full proof of causality”. See explanatory notes 2 and 3 for more details.

damage; and the general characteristics of the damage. 4.3 A causal link between an event, act or omission and the environmental damage caused shall be presumed if it is likely that the damage or a threat of damage is caused by an activity specified in Subsection 6.3. This presumption is / is not rebuttable. [4.4 The Environmental Authority or the successful claimant of a private law action shall identify the person who caused damage.] 4.5 A person is deemed to have caused the damage [or threat of damage] where there is a likelihood of … (e.g. 80) % or above that the person in question is responsible for a certain damage or threat of damage by own action or omission of action, including the omission to control an event or person under its responsibility.	Certain activities are so prone to damage that it is justified to presume causality. Specify whether the presumption shall be rebuttable or not. Like Subsection 3.5, this clarification is not needed in some jurisdictions. Again, we recommend including “threat of damage” as a threat of damage may already trigger the need for action.
Chapter 2: Public law procedures	The purpose of this chapter is to prescribe state action; state action is likely to be the most effective path for avoiding and remediating environmental damage.
5. Notification and information obligations 5.1 If environmental damage or a threat of damage emerges or a threat of damage remains regardless of preventive measures taken, the person who caused damage shall immediately notify the Environmental Authority of all the circumstances relating to the environmental damage or the threat of damage. 5.2. If the environmental damage or the threat of damage may affect human health, the Environmental Authority shall notify the authorities in charge of human health (hereafter: “health authorities”). 5.3 The person who caused damage shall, on request of the Environmental Authority and the health authorities, submit other relevant information on their request. 5.4 Not substituting the responsibility of the person who caused damage, Subsections 5.1 to 5.3 shall also apply to the owners and occupants of real estate properties and ships that are affected by an environmental damage or are under threat of damage.	A large information basis is key for appropriate administrative action. The person who caused or likely to have caused damage does not necessarily coincide with the owner or the occupant of the real estate property or ship in question.

6. Responsibility to prevent and remedy damage 6.1 The person who caused damage shall take appropriate preventive and remedial measures in accordance with Sections 7 and 9 [where that person is responsible]. 6.2 A person is responsible where the person [grossly] negligently or deliberately caused the environmental damage or the threat of damage or where the person omitted to control an event or another person under its responsibility that caused the damage. 6.3 Regardless of fault, the person who caused damage is also responsible if the environmental damage or the threat of damage has been caused by the following activities which took place under the person's responsibility or on behalf of the person: a) creation, operation or dismantling of industrial installations causing gaseous or water emissions [as defined in … Act]; b) collection, transport, storage or processing of waste [as defined in … Act] ; c) activities relating to the geological storage of chemicals, other materials and waste [as defined in … Act]; d) manufacture, use, storage, processing, release into the environment and on-site transport of dangerous chemicals / goods [as defined in … Act], plant protection products [as defined in … Act], fertilisers [as defined in … Act] and biocides [as defined in … Act]; e) transport of dangerous goods [as defined in … Act] by road, rail, inland waterways, sea or air; f) deliberate release of genetically modified organisms [as defined in … Act] into the environment and the commercial or non-commercial manufacture, use, storage or distribution thereof; g) activities relating to the use of geothermal energy [as defined in … Act]; h) activities relating to the extraction of gases, liquids or materials from the underground [as defined in … Act], including relating to the waste and waste water of these processes; i) deliberate release of liquids other than clean water [or …] into the soil, or surface or groundwater.	This is a key obligation under public law. In many if not most jurisdictions, a limitation of the obligation to cases of responsibility is appropriate. Where there is an objective to limit responsibilities, there are three main possibilities: - Responsibility for deliberate causation; - Responsibility for deliberate causation and gross negligence; - Responsibility for deliberate causation and any kind of negligence. This Subsection is only relevant where the jurisdiction in question has opted for a limitation of responsibility in accordance with Subsection 6.2 - fault-based responsibility. Fault-based responsibility as foreseen in Subsection 6.2 might not be appropriate for activities which, by their nature, are prone to risks. For reasons of environmental protection policy, a person involved in high risk activities, could be responsible for damage in cases regardless of fault. For example it would be unfair to damaged persons if they had to bear the risk of an always very risky activity undertaken by the person who caused damage whilst the latter benefits economically from that risky activity. Hence, Subsection 6.3 offers the possibility to make exemptions to the rule of fault-based responsibility. The establishment of such exemptions is easier where the jurisdiction can refer to activities pre-defined in other acts. It is important to check whether it is necessary to make explicit the applicability /

6.4 [Provisions on the applicability / non-applicability of certain sections of public and private law acts] 6.5 The liability and responsibility of a responsible person may be extended, in an individual case, by decision of the Environmental Authority, to its mother, daughter or sister legal person where that affiliated legal person has contributed to the damage or threat of damage or controls the responsible person. 6.6 The liability and responsibility of the responsible person relating to maritime claims is limited by the standards applicable to maritime claims under the 1976 Convention on Limitation of Liability for Maritime Claims.	non-applicability of certain provisions of public and private law. In particular, check whether it should be made explicit that legal successors are / are not responsible in the same way as the person who caused damage. We recommend this extension clause to avoid that legal persons can avoid liability and responsibility by establishing and shielding behind other legal persons. This is the alternative regulatory technique referred to in the comment to Subsection 1.2 clause b).
7. Responsible person taking preventive measures 7.1 The responsible person shall immediately take preventive measures if environmental damage or a threat of damage occurs, and notify the Environmental Authority thereof. 7.2 In order to perform the obligation provided for in Subsection 7.1, the responsible person may address the Environmental Authority for the assessment of the suitability of the preventive measures envisaged. 7.3 The Environmental Authority may specify the obligation at Subsection 7.1 in the light of the concrete case. It may also direct the responsible person to undertake preventive measures.	Preventive measures have to be taken quickly. Hence, we do not recommend a formal procedure with the Environmental Authority, but just the possibility to get feedback. However, the Environmental Authority should be in the position to give instructions, namely where the responsible person is inactive or envisaging inappropriate measures.
8. Environmental Authority taking preventive measures 8.1 The Environmental Authority may at any time take preventive measures. 8.2 Preventive measures made by the Environmental Authority does not release the responsible person's obligations under Section 7.	In particular to avoid increasing costs, the Environmental Authority should be empowered to take preventive measures itself.
9. Obligation to take remedial measures 9.1 The responsible person shall take remedial measures in accordance with the	Relinquishing the responsible person's obligation might be necessary where the

remedial action plan developed in accordance with sections 11 to 14 and at the responsible person's own expense, unless the Environmental Authority has relinquished the responsible person from this obligation. 9.2 Before the approval of the remedial action plan by the Environmental Authority in accordance with Section 14, the responsible person shall take remedial measures only where approved by the Environmental Authority. 9.3 Pending the approval of the remedial action plan, the Environmental Authority may request the responsible person to take certain remedial measures and may give mandatory instructions on how to take the measures.	responsible person is unable to take the appropriate remedial measures. Taking certain, undoubtedly necessary measures, can make sense even before the remedial action plan has been developed and approved. However, such measures should be agreed upon by the Environmental Authority. Likewise, the Environmental Authority should be empowered to impose necessary remedial measures pending the approval of the remedial action plan, in particular where early remedial measures are easier to implement or cheaper or where they impede subsequent secondary damages.
10. Remedial measures taken by the Environmental Authority 10.1 The Environmental Authority may at any time take its own remedial measures. 10.2 The remedial measures of the Environmental Authority do not release the responsible person from liability.	Similar to the preventive measures empowerment, there should also be an empowerment for the Environmental Authority to take remedial measures itself, namely to avoid additional costs or subsequent secondary damages.
11. Quality of remedial measures 11.1 Measures remediating damage shall return the status of a habitat, species, protected area or water or their benefits ("restorative remedial measures") to the baseline condition, to the extent possible. 11.2 Where the baseline condition cannot be returned, additional substitutive remedial measures shall be taken to achieve a level of the benefits of a habitat, species, protected area or water, which is analogous to the one which would have existed if the baseline condition of the benefits of the habitat, species, protected area or water had been restored in the place of occurrence of the environmental damage or, if this is not possible, to replace it with an equivalent condition. If it is possible and practical, substitutive remedial measures may be taken in a place that is geographically linked to the place where the environmental damage occurred. 11.3 Pending the measures under Subsections 11.1 and 11.2 attaining their full effect, compensatory remedial measures shall be taken to equilibrate the interim damage of a habitat, species, protected area	This section determines the general goal of remedial measures: the baseline condition or an equivalent overall state.

or water or the benefits thereof. This includes measures for the improvement of the status of a habitat, species, protected area or water in the place of occurrence of environmental damage or in an alternative area. The measures do not include financial compensation to the public.	
12. Selection of measures for remediating damage caused to habitat, species, protected area and water 12.1 The Environmental Authority and the responsible person shall select remedial measures on the basis of the following circumstances: a) the effects of the measures on human, animal and plant health and human safety; b) the geographical links to the area where the environmental damage has been caused; c) the likelihood of the success of the measures; d) the extent to which the taking of remedial measures shall allow for preventing future damage or collateral damage; e) the extent to which the remedial measure contributes to the recovery of the natural resource and its benefit; f) the effects of the measures on social, economic, cultural and other significant factors; g) the length of time it takes to eliminate the environmental damage; h) the extent to which it is possible to restore the area that has suffered the environmental damage; i) the costs related to the measures. 12.2 Preference shall be given to remedial measures by which the baseline condition of the natural resource and the benefits thereof are achieved directly and in an accelerated time frame, unless a natural recovery provides important ecological advantages. 12.3 For substitutive and compensatory remedial measures, the remedial action shall give preference to the substitution of the damaged natural resource or the benefits thereof with an equivalent natural resource or the benefits thereof, whilst establishing [or protecting] a natural resource of the same type, quality and quantity as the damaged natural resource and the benefits thereof is to be preferred to the establishment [or protection] of an alternative natural resource and the benefits thereof.	This section lists additional parameters and criteria for the selection of remedial measures. We do not cover air pollution and some specificities apply to land damages. For air, see explanatory note 1. For land damages, see explanatory note 4.

12.4 If it is not possible to substitute a damaged natural resource or the benefits thereof with an equivalent one, remedial measures shall be identified using the method prescribed by the Environmental Authority. 12.5 If the responsible person has caused several environmental damage events and the Environmental Authority finds that it is not possible to simultaneously implement the required remedial measures, the Environmental Authority may determine which of the damage events shall receive the first remedial measures. When doing so, the Environmental Authority shall take into account the nature and the extent of the environmental damage, the possibilities of natural recovery of the environment and the risk that the environmental damage may affect human health.	
13. Preparation of remedial action plan 13.1 If remedial measures are taken by the Environmental Authority in accordance with Section 10, the remedial action plan shall be elaborated by the Environmental Authority. Otherwise, the responsible person shall elaborate the remedial action plan [in cooperation with an external reviewer / accredited expert]. Where there are several responsible persons, the Environmental Authority shall designate the lead responsible person to coordinate with the other responsible persons. 13.2 The responsible person shall cooperate with the Environmental Authority for the elaboration of the remedial action plan. It shall inform the Environmental Authority of the interim stages of elaboration of the remedial action plan. It shall within a reasonable time and not later than by the date set by the Environmental Authority, submit the remedial action plan to the Environmental Authority for approval [in the digitally signed electronic form or on paper].	Consider strict deadlines as an alternative. Consider whether formal submission is necessary.
14. Approval of remedial action plan 14.1 The Environmental Authority shall approve a remedial action elaborated by the responsible person if: - the measures in the remedial action plan allows for remediating the environmental damage and the remedial measures are selected and justified in accordance with sections 11 and 12,	In addition to the provisions in the left column, it might be necessary, in certain jurisdictions, to give authorities an empowerment to set out internal procedural rules.

[- the remedial action plan sets out suitable and sufficient measures for the removal, isolation, restriction of the spread or minimising of the effects of the pollutants so that the polluted area does not pose a threat to human health]. 14.2 Before approving a remedial action plan, the Environmental Authority shall take into account the person concerned specified at Subsection 16.1 and the person whose property is affected by the remedial measures. 14.3 If the remedial action plan does not comply with the criteria provided for in Subsection 14.1 or 14.2, the Environmental Authority shall reject it and shall request the responsible person to submit a modified remedial action plan within … (e.g. one month). 14.4 Alternatively, the Environmental Authority may amend the remedial action plan before approving it, taking into account the provisions at Sections 11 and 12. 14.5 The Environmental Authority may, on the basis of Subsection 12.3, approve restorative remedial measures by which the baseline condition of a habitat, species, protected area, water or the benefits thereof are not achieved fully if the full remedy of the damage caused to the habitat, species, protected area, water or their benefits is guaranteed by substitutive or compensatory measures.	This additional condition might be useful to jurisdictions tackling the risk of continuous spreading of pollutants. Necessary to avoid a limbo situation. This empowerment is useful in cases where it is unlikely that the responsible person is able to correct the remedial action plan or where it is simply faster to amend the plan.
15. Implementation of remedial action plan 15.1 Remedial measures shall be implemented in accordance with the remedial action plan approved in accordance with section 14. 15.2 If upon taking remedial measures it becomes evident that the extent of environmental damage exceeds the damage identified in the remedial action plan or that the circumstances specified at Sections 11 and 12, the basis of which the remedial measures were selected, have been assessed incorrectly, or any other circumstances have changed, the Environmental Authority shall, after consulting the responsible person and the persons affected by the damage, make amendments to the remedial action plan.	Here, like in other sections of this chapter, we do not deal with court appeals, assuming that generic provisions of the respective jurisdiction would mostly suffice. However, we recognise that in certain situations and jurisdictions, dedicated rules on court appeals can make sense.

15.3 When the measures specified in the remedial action plan have been taken and the damaged natural resource or the damaged benefit thereof has been restored, substituted or compensated for and the threats to human health have been eliminated, the Environmental Authority shall, by its administrative decision, declare the remedial action plan as implemented and the environmental damage as remedied. 15.4 The Environmental Authority may decide that the taking of further remedial measures is not necessary if the remedial measures taken guarantee that there is no significant risk to human, animal or plant health and no substantial adverse effects on a habitat, species, protected area or water or the costs of the remedial measures to be taken for achieving the baseline condition or equivalent condition would be disproportionate in comparison with the achieved improvement of the state of the environment.	
16. Rights of person concerned and of NGOs 16.1 The following persons may request the Environmental Authority to take preventive or remedial measures or to obligate the responsible person to take preventive or remedial measures [and may request to be consulted in the procedures set out in Sections 13 to 15]: a) a person whose rights are violated by the environmental damage or a threat of damage (hereinafter *person concerned*); b) a non-governmental environmental organisation [specified in … / listed in Annex I] [whose environmental protection goal or environmental protection activities are affected by the environmental damage or the threat of damage]. 16.2 The Environmental Authority shall decide on the need to take preventive or remedial measures within 30 days after the receipt of the request specified in Subsection 16.1. The Environmental Authority shall	Persons concerned should obtain the right to request measures to be taken by the Environmental Authority, namely in view of cases where the responsible person is unlikely to deliver. Moreover, they may or may not be included in the procedures of Sections 13 to 15. In addition, a more or less broad or restricted circle of non-governmental environmental organisations can be empowered to operate as defenders of public interest. We present here two techniques for restriction: - Enumeration in a list; - Setting up the condition that they must be directly concerned. Alternatively, the Environmental Authority could be empowered to establish such a list of NGOs. There is often a risk that authorities do not make timely decisions. We suggest here a light reporting obligation to incentivise timely decision-making.

immediately inform the person who submitted the request of its reasoned decision by submitting a copy of the decision to the person who submitted the request. 16.3 Where an immediate decision is not possible due to the need for further investigations, the Environmental Authority shall inform the concerned person or NGO referred to in Subsection 16.1 on the investigative measures taken and the likely termination of fact finding. The Environmental Authority shall provide monthly progress reports during the course of investigations until a final decision is taken. 16.4 The concerned person or NGO referred to in Subsection 16.2 may sue the Environmental Authority for inactivity starting 90 days from the receipt of the request specified in Subsection 16.1 at the responsible administrative court. 16.5 The concerned person or NGO referred to in Subsection 16.2 may sue the responsible person starting 90 days from the receipt of the request specified in Subsection 16.1, at the relevant civil / administrative court in accordance with Chapter 3.	Where the incentive does not suffice, it should be possible to sue the authority for inactivity. Jurisdictions with unified time limits for addressing administrative courts may drop the 90-days clause here. This Subsection bridges the private lawsuits of Chapter 3. It is possible to admit the private lawsuits in parallel to the public law procedure or just thereafter or, as suggested here, after a certain deliberation time for the Environmental Authority.
17. Obligation to tolerate preventive and remedial measures 17.1 The owner of a real estate shall tolerate investigations of environmental damages or a threat of damage and preventive or remedial measures at the real estate where these take place on the basis of an administrative decision. 17.2 Upon making an administrative decision specified in Subsection 17.1, the Environmental Authority shall take into account the justified interests of the owner of the real estate. 17.3 If damage is caused to the owner of the real estate as a result of the preventive or remediation measures, the responsible person shall eliminate the consequences of the damage or compensate the owner of the real estate for the damage in accordance with civil law. 17.4 Persons having a right to use a real estate or a part of it for more than 12-months have the same rights and obligations as owners. In any case persons having a right to use a real estate or a part of it have an obligation specified in Subsection 17.1.	Contrary to other parts, we have not referred to ships here though ships are mostly assimilated to real estate. It would go too far to give rights to short-term renters. But long-term users face a situation similar to the owners. We recommend cutting off renters and users who rent or use for one year or less.

18. Administrative costs relating to preventing and remediating environmental damage	
18.1 The administrative costs related to the prevention or remediation of environmental damage (hereinafter *costs*) are the costs of identifying, preventing and remedying environmental damage and a threat of damage, including the costs of taking preventive and remedial measures, involving experts, assessing alternative measures, collecting information, monitoring and supervision as well as organisational, legal assistance and other justified costs of the administrative authority relating to the implementation of this Act. The costs shall be borne by the responsible person.	The first sentence of Subsection 18.1 contains a definition which could also be placed in Section 2, whilst some jurisdictions prefer to leave definitions at the place where they are used if there is only one such place.
18.2 However, the costs shall be borne by the Environmental Authority if: a) the responsible person fails to perform the obligation provided for in Subsection 18.1; b) the responsible person is released from the obligation to bear the costs in accordance with Subsections 18.4 and 18.5: c) it is unknown who caused the damage.	Here we speak about the primary responsibility for the costs. Here again we speak about the primary responsibility for the costs.
18.3 If the responsible person has been identified, the Environmental Authority shall recover the costs incurred on the basis of Subsection 18.2 from the responsible person, unless the responsible person is released from the obligation to bear the costs in accordance with Subsections 18.4 and 18.5.	Here we speak about the right to obtain recovery of the costs, thus a secondary responsibility.
18.4 The Environmental Authority shall release the responsible person from the obligation to pay the costs of taking preventive and remedial measures if the person proves that: - the environmental damage or the threat of damage was primarily caused by a third party; - the environmental damage or a threat of damage was caused by following an order or instruction given by a public authority, except in the event where the order or instruction was given due to a prior illegal act or omission of the person who caused the damage.	Here we deal with the possibility of release from the primary responsibility to pay the costs, and implicitly we also limit the right of the Environmental Authority to obtain cost recovery, thus the secondary responsibility. Where it is required to release the responsible person from the obligation to take preventive and remedial measures, it would suffice to modify the text to: "… to pay the costs and to take preventive and remedial measures …".
18.5 The Environmental Authority shall release the responsible person from the obligation to pay the costs of taking remedial measures if the environmental damage has been caused by an omission or an event that has been authorised by an administrative	The comment of 18.4 applies here as well.

licence and the person who caused the damage complied with the obligations imposed by the administrative licence and on the basis of law. 18.6 Subsection 18.5 does not apply to the costs of taking measures to prevent environmental damage caused by any of the activities listed in Subsection 6.3.	For activities which are prone to accidents, it would not be fair for the public budget to cover the costs. Instead, the operator should have insurance, the more so as they also make profits with their activity.
19. Payment notice for reimbursement of costs 19.1 In the event specified in Subsection 18.3, the Environmental Authority shall submit a calculation of costs and issue a payment notice to the responsible person. 19.2 The amount of the costs which shall be reimbursed and the work, service or thing in connection with the buying or manufacturing of which the costs were incurred and, if the costs were incurred on the basis of a remedial action plan, a reference to the provision of the remedial action plan that provided for the procurement of the relevant work, service or thing shall be set out in the calculation of costs. 19.3 The responsible person shall pay the costs in the amount and by the due date indicated in the payment notice. The term for the payment of the costs shall not be shorter than 30 calendar days. 19.4 In the event of failure to reimburse the costs by the due date, the responsible person shall pay late interest at the rate of … (e.g. 0.02) percent of the overdue sum per day. 19.5 The Environmental Authority has the right to submit a calculation of costs and a payment notice to the responsible person within five years from the date of termination of the taking of the preventive or remedial measures or from the date when the responsible person was identified, whichever took place later.	This section might not be necessary in many jurisdictions, namely where general provisions cover the payment mechanisms.
20. Staggering of payment of costs 20.1 The Environmental Authority may, at the reasoned request of the responsible person, stagger the payment of costs over a term of up to ten years. To stagger costs that significantly affect the state budget revenue, the Environmental Authority shall coordinate the staggering with the Ministry of Finance beforehand. The staggering of the payment of the costs does not release the responsible	The same applies here. Staggering payment can be in the interest of the authority namely to avoid complete payment failure due to insolvency. At the same time, there is also a risk that costs are finally not taken over due to the staggering. Hence, complex assessments are needed, and these might be too difficult to implement for some administrations.

person from the obligation to pay current or future costs. 20.2 Upon staggering the payment of the costs, interest shall be calculated at the rate of 0.03 per cent each calendar day. The calculation of interest is suspended upon declaration of the insolvency of the responsible person. 20.3 Upon deciding whether to approve the application, the Environmental Authority shall take into account the financial situation and economic indicators of the responsible person, its prior performance of the obligations to pay costs and environmental charges, the practicality of the staggering of the payment of the costs and, if a security is required, the security provided. The Environmental Authority may request documents proving these circumstances. 20.4 The Environmental Authority shall decide whether to grant or refuse to grant the application within 10 working days from the submission of the application or, where additional documents are requested, from the submission of the documents. 20.5 The Environmental Authority may refuse to grant an application for the staggering of the payment of costs if: a) the application is not sufficiently reasoned; b) the responsible person fails to provide the required security or the Environmental Authority does not consider the security provided to be sufficient, trustworthy or easily marketable, or if the formalisation of the security shall result in excessive administrative costs; c) upon consideration of a compromise proposal made by a debtor in bankruptcy proceedings, the Environmental Authority finds that the financial situation of the debtor does not allow for the performance of the obligations assumed under the compromise; or d) other circumstances or grounds, such as lack of good-will cooperation or unreliability exists, which cause the Environmental Authority not to consider the staggering of the payment of the costs to be justified. 20.6 The Environmental Authority shall revoke the decision to stagger payment of the costs if the responsible person: - does not comply with the schedule of payments or does not perform the obligation provided for in the Law of	

Property Act to keep the thing provided as the security encumbered with a pledge, or - in the event of a decrease in the value or reliability of the security, where additional security or a replacement security fails to be provided by the due date set by the Environmental Authority.	
21. Security upon staggered payment of costs 21.1 The Environmental Authority may request a security upon staggering the payment of costs. Security shall not be requested from a person who is insolvent and whose debt is staggered for the purpose of making a compromise in insolvency proceedings. 21.2 The following may be used as a security for the staggering of the payment of costs: a) a pledge, thereby preference is given to a mortgage of the first ranking or a registered security over movables; b) the guarantee of a credit or financial institution or insurer; c) a security deposit; d) a notarial deposit. 21.3 Upon establishment of a mortgage, the owner of the real estate agrees to be subject to immediate compulsory enforcement for the settlement of the claim secured by the mortgage. 21.4 The value of the security shall, at the time the security is provided, amount to at least … (e.g. 115) percent of the amount of the costs to be staggered. If the Environmental Authority identifies that the security is no longer sufficient or does not reliably ensure the payment of the costs, the Environmental Authority shall have the right to demand that the security be increased or that the initial security be replaced with a new security. 21.5 The procedure for the provision, use, increase, replacement and release of securities shall be established by a regulation of the minister responsible for the field.	Securities upon staggered payment of costs are even more complex to handle, we therefore do not recommend this section for most jurisdictions.

22. Settlement of disputes with Environmental Authority 22.1 Disputes arising from the prevention of environmental damage or a threat of damage or from remediating environmental damage that involve the Environmental Authority are resolved by the Ministry of the Environment, in accordance with procedural rules set out by this ministry. 22.2 Before filing an appeal with an administrative court in the event of a dispute arising from the implementation of this Act, intra-authority appeal proceedings shall be exhausted on the conditions and in accordance with the procedure outlined in the … (e.g. Administrative Procedure Act). 22.3 The Ministry of the Environment shall resolve an intra-authority appeal within … (e.g. 30) working days as of the filing of the appeal. 22.4 The Ministry of the Environment and the appellant have the right to involve experts in resolving an intra-authority appeal. 22.5 The costs of involving the expert are borne by the appellant, where the appeal is successful such costs can be included in the costs agreement..	Jurisdictions should drop this provision where there is a constitutional right to unconditional / immediate access to court.
23. Sanctions regarding main obligations 23.1 The penalty for failure to take mandatory preventive or remedial measures, failure to submit a proper remedial action plan or disregarding the obligations established in the remedial action plan before the approval of the remedial action plan is a fine of up to … [fine units]. 23.2 The penalty for the same act committed by a legal person is a fine of up to … [fine units]. 23.3 The penalty for failure to notify the Environmental Authority of environmental damage or a threat of damage or refusal to submit the required information is a fine of up to … [fine units]. 23.4 The penalty for the same act committed by a legal person is a fine of up to … [fine units].	Some jurisdictions use “fine units” to calculate fines. But other jurisdictions can simply insert appropriate fines in their respective terminology.
24. Prescription of rights and obligations Unless otherwise specified above, all rights and obligations referred to Chapter 2 are prescribed within … (e.g. 3) years after the rights holder or the Environmental Authority	

took note of the respective circumstances, and at the latest … (e.g. 10) years after the circumstances occurred.	
Chapter 3: Private lawsuits	The purpose of this chapter is to complement Chapter 2. Establishing a second track for private lawsuits is in particular advantageous where administrations are weak.
25. Admissible claims 25.1 At the end of the period indicated in Subsection 17.5, the persons concerned or NGO as defined in Subsection 17.2 may sue the responsible person in order to seek: a) preventive measures against foreseeable environmental damage, [b) environmental damage limitation measures,] c) environmental damage remedial measures, d) compensation of damages, including indirect damages as defined in Subsection 2.11. 25.2 The cases referred to in Subsection 25.1 include **OR** do not include climate change damages. 25.3 The end of the period indicated in Subsection 17.5 may be waived for cases relating to climate change [and other non-point pollution cases]. 25.4 Only damages with a value of … or beyond may become subject to lawsuits.	Please consider whether you require this type of claim to be inserted or not. Arguably, measures aiming at damage limitation can also be attributed to measures against expected environmental damage, but this is a question of interpretation so it might be useful to set-up this distinct category of measures. If you chose to insert this category, consider aligning with Chapter 2. We did not refer to damage limitation measures in Chapter 2. At least for climate change damages, but possibly also for other non-point pollution cases, it makes little sense and is a disproportionate burden to have to await the public law procedure in Chapter 2. Such a threshold avoids overburdening courts.
26. Admissible claimants 26.1 Natural or legal persons may sue in accordance with Chapter 3 where: a) They reside or have a place of business on the national territory; b) The defendant resides or has a place of business on the national territory; c) The damage occurred on the national territory or within the exclusive economic zone attributed to it; d) The damage occurred to or on a ship, plane or other object attributed to the national territory[; e) The causal action leading to the damage occured, at least partly, on the national territory]. 26.2 Private agreements limiting the right to sue in accordance with the previous	In order to avoid worldwide competency for claims, we recommend some limiting rules, unless generic provisions (e.g. on international private law) are sufficient. This is to avoid that the limitation can be established by a single clause in a long

paragraph are valid / not valid / valid only where the following conditions are fulfilled: … (e.g.: the limitation shall have been signed-off by a separate signature.) 26.3 The association(s) … / The state defender of nature may sue to represent nature as such. Any compensation obtained by them shall be utilised to protect nature [at the site of damage or closest to it] **OR** [at a place where the compensation has the best possible effect on nature].	contract or even by general terms and conditions. An increasingly popular regulatory technique involves attributing rights to nature or parts of it and/or assigning NGOs or public institutions as state defenders of nature. This regulatory technique can be used both in public law procedures (Chapter 2) and in private law procedures (this Chapter 3). When used under private law, it creates an important deterrent effect. For more information about this regulatory technique read "Attributing legal personality to nature".
27. Multiple claimants 27.1 [Within the same court,] The lawsuits / procedures of multiple claimants against the same defendant relating to the same / parallel / similar damage(s) shall be combined[, unless this leads to a substantive delay of one of the lawsuits]. [Different courts may combine lawsuits / procedures relating to the same / parallel / similar damage(s) or declare one of the courts solely responsible where this leads to a more efficient and fair processing.] 27.2 Claimants may transfer their rights to associations for joint pursuit or may request to be represented by associations. 27.3 Representation by associations is exempt from the requirement of mandatory representation by attorneys. 27.4 The court may, on request of claimants or on its own initiative, suspend cases until the first case against the same defendant relating to the same damage has ended with a ruling that has exhausted all appeals, which covers questions of principle also relevant for the suspended cases.	Please check whether you need provisions of this kind or whether generic rules suffice. To combine lawsuits / procedures might seem simple and logical, however, it becomes complicated or even unfair where the lawsuits are raised at different points in time so that the combination leads to delays for the more advanced lawsuits. Moreover, it should be clarified whether the obligation to combine lawsuits / procedures applies only within one court or whether it applies also where different courts process parallel lawsuits. To avoid contradicting rulings, combining lawsuits / procedures seems useful. But it might also render the access to the court more difficult for claimants where the local court is not responsible anymore. Please reflect on two levels: - When shall lawsuits / procedures be combined? - When may lawsuits / procedures be combined? These two clauses might not be needed in most jurisdictions, but are pertinent where rules protect the profession of attorneys from competition by non-attorneys. This provision increases the court's efficiency. However, it is also problematic insofar as the claimants of the suspended cases are curtailed of their procedural rights: they cannot intervene in the precedent setting case. Combining lawsuits / procedures seems to be a less invasive way of rationalisation.

27.5 Rights according to this act may be ceded / may not be ceded / may be ceded under the condition that … (e.g. the recipient does not act professionally).	Evidently, there is a partial overlap with clause 27.2. to be aware of.
28. Right defendants 28.1 In environmental liability claims other than those relating to climate change, only the following natural or legal persons may be sued: - The responsible person in the meaning of Subsections 6.2 and 6.3; - The legal person fulfilling the conditions of Subsection 6.5, regardless of whether the Environmental Authority has extended the responsibility and liability in accordance with this Subsection. 28.2 In case of climate change claims, only the following legal persons may be sued: a) The legal person that caused more than … (e.g. 0.3%) of all CO2-emissions [or more than … (e.g. 0.1%) of methane emissions] since … (e.g. 1965) ("tortfeasor"), including emissions caused by any daughter company or otherwise directly or indirectly dependent legal person shall be attributed to that legal person; b) The legal person directly or indirectly owns more than 50% of the legal person referred to under a); c) The legal person who is, like the legal person referred to under a), directly or indirectly owned to more than 50% by a common owner; d) The legal person who, whilst not fulfilling the conditions of b) or c), is by contractual arrangement, directly	In order to avoid inconsistencies with Chapter 2 and an overburdening of courts, we recommend a limitation of potential targets of lawsuits in line with the responsibility scheme set out in Chapter 2, Section 6. It is necessary to limit the liability for climate change to the major polluters, otherwise any human could be sued as individual polluters of CO2 or methane. We recommend a double limitation: first to legal persons responsible for CO2-emissions, because responsibility for CO2-emissions is relatively well documented and also (still) more important than primary methane emissions, e.g. from cattle. Secondary methane emissions inter alia caused via ending permafrost and warmer oceans is primarily to be attributed to CO2-emissions again. For jurisdictions that wish nonetheless to integrate methane (or other gases), we have added a square bracket in 28.2 a). The second necessary limitation is a percentage cut-off. This cut-off is, like most cut-offs, somehow arbitrary and debatable. We suggest as a basis for discussion 0.3%. Respective data are available via specialised publications or institutes. Subject to the availability of most recent reliable data, one or another reference year should be chosen. The so-called "carbon major" companies mostly operate via daughter companies or other dependent companies. It is advisable to clarify that both in terms of attribution [see last part of a)] and responsibility [from b) to d)], all the legal persons / companies controlled by the mother legal person / company or otherwise dominant legal person / company shall be regarded as one. Subsection 28.2 d) is important for closing any loopholes used to circumvent liability.

or indirectly, under full control of the legal person referred to under a). 28.3 Defendants may not be sued where the claimed **OR** expected compensation or the value of a requested measure is lower than … (insert a value in your currency).	A value threshold is useful to avoid overburdening of courts.
29. Multiple defendants 29.1 Multiple defendants who have together, regardless of coordinated or not, caused a damage or threat of damage are jointly and commonly liable. [29.2 For climate change damages, no defendant is obliged to compensate more than [X times] its percentage responsibility **OR** … (e.g. 25) percent.] [29.3 For damages with a clear percentage responsibility of the defendants other than those related to climate change, no defendant is obliged to compensate more than [X times] its percentage responsibility.]	It is basically unfair that a victim of tort has to sue several tortfeasors / defendants for a small fraction of the damage. Therefore, joint and common liability should be the rule, and responsibility for damages should be equalised / apportioned amongst tortfeasors, see Section 30. However, in the case of climate change damages, no "carbon major" has so far caused more than 6% of the CO2 pollution, whatever reference time frame is chosen. With such a limited percentage of causation, it might be deemed inappropriate to burden a single defendant/tortfeasor with the full liability. If so, jurisdictions may opt to limit the liability either to X times its percentage responsibility or set up an overall percentage limit. Likewise, it may be appropriate to limit the overall responsibility of single tortfeasors in other cases where there is a clear percentage responsibility.
30. Equalisation / Apportion[ment] claims 30.1 Defendants who have compensated claimants may launch equalisation / apportion[ment] claims against other tortfeasors for the respective damage compensation. 30.2 Where equalisation / apportion[ment] claims concur with damage compensation claims, the latter shall have priority. 30.3 Defendants launching multiple equalisation / apportion[ment] claims shall limit their claims, including those launched in other jurisdictions, in such a way that all defendants involved compensate for the precise damage in proportion to their respective percentage responsibility. [30.4 The upper limit of X times the percentage responsibility set out in Subsections 29.2 and 29.3 shall also apply in cases of equalisation / apportion[ment] claims.]	The term "equalisation" is more used in Civil law jurisdictions, whereas "apportionment" or "apportion" is more used in Common law jurisdictions. Evidently, equalisation / apportionment claims only make sense where a defendant / tortfeasor has compensated more than its percentage contribution. This provision ensures that victims of tort receive compensation first, with priority. In particular where several jurisdictions or courts come into play, there is a risk that defendants obtain too much equalisation / apportion[ment].

31. Limitation of overall compensation 31.1 Claimants launching multiple claims shall limit their claims, including those launched in other jurisdictions, in such a way that all defendants involved do not compensate cumulatively more than the precise damage. 31.2 When initiating procedures under this Chapter, claimants shall disclose their past and intended lawsuits and receive compensation regarding the same event or damage.	In particular the possibility to launch claims in different jurisdictions triggers the risk that claimants may receive more compensation than merited.
32. Prescription All rights and obligations referred to in this Chapter are prescribed within … (e.g. 3) years after the rights holder took note of the respective circumstances, and at the latest … (e.g. 10) years after the circumstances occurred.	Text (to be) aligned with Section 24.

Explanatory notes:

No. 1: Air pollution

Many countries have separate air pollution laws that exist alongside environmental laws. Countries like Egypt and many other African countries have a rule of paying compensation for the damage caused by any kind of pollution including air pollution.

Egypt
"Compensation: Means compensation for all kinds of damage resulting from pollution incidents caused by violating laws and international conventions which Arab Republic of Egypt is a party thereto, from pollution incidents involving toxic and any other harmful substances, as well as pollution resulting from air pollution, collision and keeling of ships or arising during their loading or unloading, or caused by any other accidents. Compensation includes making up for environmental and traditional damage, as well as costs of restoring matters to their original state or remedying the environment" - Article 1, Subsection 28 of the Environmental Law, Law 4 of 1994 (in Arabic).
https://www.eeaa.gov.eg/portals/0/eeaaReports/N-Law/law4_text_en_amended.doc (English translation of the Environmental Law)

Kenya
Kenya's Environmental Protection Act provides for a legal regime to regulate, manage, protect and conserve biological diversity resources and access to genetic resources, wetlands, forests, marine and freshwater resources and the ozone layer. Although the Act does not include a definition of "environmental damage" or "natural resources damages", it does define "pollution" and it also includes a definition of the polluter-pays principle.
Under the general principles of the entitlement (Section 3) to clean and healthy environment, the Act states that any person may apply to the High Court to compel the person responsible for environmental degradation to restore the environment as far as practicable to its

immediate condition prior to the damage. This section also provides compensation for any victim of pollution and the cost of beneficial uses lost as a result of an act of pollution and other losses that are connected with or incidental to pollution. The Act also provides for a National Environmental Restoration Fund (Section 25) to be established to function as an supplementary fund for the mitigation of environmental degradation where perpetrator is not identifiable or where exceptional circumstances require intervention.
(Environmental Management and Coordination Act No.8 of 1999)
https://rise.esmap.org/data/files/library/kenya/Energy%20Access/EA%2021.3A%20Environmental%20Management%20Coordination%20Act,%20No%208%20of%201999.pdf

India

India too has a method for calculating compensation for environmental damages caused.
EC (Environmental Compensation) = PI (Pollution Index) x N (Number of days of violation took place) x R (A factor in Rupees for EC) x S (factor for scale of operations) x LF (Location Factor) (https://cpcb.nic.in/uploads/report-15.07.2019.pdf)

Cases considered for levying EC:

1. Discharges in violation of consent conditions, mainly prescribed standards / consent limits.
2. Online Continuous Emission / Effluent Monitoring systems (OCEMS).
3. Not complying with the directions issued, such as direction for closure due to non-installation of OCEMS, non-adherence to the action plans submitted etc.
4. Intentional avoidance of data submission or data manipulation by tampering the accidental discharge of short duration resulting in damage to the environment.
5. Intentional discharges to the environment - land, water and air resulting in acute
6. injury or damage to the environment.
7. Injection of treated / partially treated / untreated effluents to ground water.

(Report of the Central Pollution Control Board)
https://cpcb.nic.in/uploads/report-15.07.2019.pdf

Japan

In 1967 Japan implemented the Basic Law for Environmental Pollution Control which has acted as the foundation for Japanese environmental regulatory guidelines and principles.
In 1968 Japan implemented Air Pollution Control Law No.97, under the Article 25 of the Act making the polluter liable to pay compensation in the case of air pollution resulting in harm to human life or health. The Article describes a polluter's liability as "strict liability". Consequently even in the event of disaster or any other irresistible force the polluter is still liable for compensation. The court is only required to take the circumstances into account in deciding the extent of the polluter's liability and the sum of harm.

The Law allows individuals to proceed for compensation independently within a specified time against a polluter. Article 33-37 of the Act further makes a polluter liable to imprisonment and/or a fine.
(Air Pollution Control Act, Act No. 97 of June 10, 1968)
https://policy.asiapacificenergy.org/sites/default/files/Air%20Pollution%20Control%20Act.pdf

No. 2: Likelihood of causation and standards of proof

Jurisdictions have their own traditions regarding the degree of certainty or the likelihood that a certain allegation or assumption can be used in law. This model law does not judge on the various traditions. However, it responds to a trend emerging over decades in various jurisdictions, the trend to shift from abstract standards of proof like “certainty” or “beyond a reasonable doubt” to more nuanced and quantified concepts like “high degree of likelihood”. A mathematical concept seems to trickle slowly but surely into legal texts. We assume that there is a reason for this trend, e.g. that very high verbal standards of proof are deemed as too severe, not fair. Another reason might be that doubts can always arise.

The model law responds to this trend by suggesting a further step. Once we are in the domain of mathematical likelihoods, there is no reason not to quantify the requested likelihood in precise mathematical terms. A quantified threshold / standard of proof will create a more uniform understanding of where to set the limit than verbally expressed quantifications like “high degree of likelihood”. At the end of the day, mathematical likelihood thresholds create more certainty.

Can the advantage of mathematical expressions also be reached by applying more expertise? We do not think that expertise alone is sufficient in all cases. Even with the best possible expertise, one can only make likelihood assessments in many cases with complex causality strings. Otherwise said, expertise plus verbal expressions is not as precise as expertise and mathematical expressions in all cases where there is no likelihood close to 100% or “certainty” in verbal terms. Expertise improves the basis for likelihood assessments, but has no influence on the threshold.

No. 3: Methods and elements for determining causation

Determining causation is a tricky issue. We cannot provide a complete comparative overview on methods and elements used in various jurisdictions here, but we can refer to a few basic ones:

In some jurisdictions, for example the United States of America, the concept of “deductive inference” is used. Deductive inference means an act of setting up a generalised statement and backing it up with specific scenarios or information, whilst “inductive inference” means the act of using specific empirical scenarios and deriving a generalised conclusion from them. Both are to be distinguished from “abductive inference” which is based on the principle of learning by doing or a trial and error method.
All the concepts can be used in the framework of on-the-spot studies and inspections or within simulations. Moreover, where data are available for similar environmental damages, these data can be used as references, e.g. to calculate likely pollution dissemination patterns and speed.

Environmental impact assessments can help as well. Where an environmental impact assessment has dealt with the possibility of damage that now has occurred, this is quite obvious. But even where the damage that occurred was not subject to an impact assessment, the knowledge used for the calculation of environmental impact assessments can partly be used as well to establish causal chains or likelihoods of causal chains.

UNEP defines Environmental Impact Assessment (EIA) as a tool used to identify the environmental, social and economic impacts of a project prior to decision-making. It aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options to decision-makers.

To understand causality, four elements must be clearly present, regardless of the means of communication (e.g. text, matrix, diagram): (a) the important elements in the system where the project is to be implemented; (b) the project action; (c) the impacts; and (d) the causal links between the project action (as the cause) and the impacts (or effects) on the system elements. These four aspects of causality can be utilised as criteria for determining whether or not its transmission is effective.

EIA is a detailed report on how a project may harm the environment, and one major area of consideration is monitoring and compliance, where a Task Force/High Level Committee is formed to ensure that the measures for minimising or not harming the environment are followed. Every six months, it must be completed. If it is determined that a party is liable for environmental harm in any way, the party is subjected to a penalty, which may include the closure of the project and the restoration of the land to its previous state.

Qualitative and quantitative methodologies can be used to determine causal relationships. As previously said, if governments can establish or form a High Level Task Force with experts and other prominent people in the field, studies and inspections might be conducted to aid in finding the links that could harm the environment.

Respecting the causation premise of EIA can provide practitioners with extra benefits, primarily in terms of document optimisation, cost savings, integrity and coherence verification, and more efficient mitigation strategies.

No. 4: Methods for assessing and remedying land damage

In cases of environmental damage, the victim is likely to seek financial compensation to cover a variety of expenditures incurred as a result of the material destruction of environmental resources. Loss of revenue or costs associated with emergency response, clean-up, impact studies, restoration, or monitoring are examples.

The concept of pure environmental damage, on the other hand, causes problems because it does not easily fit into standard approaches to civil responsibility. These standard approaches are intended to recompense an injured individual by ordering the person who caused the damage to pay the financial consequences of the damage. Hence, pure environmental damage may be impossible to quantify in terms of money. A widely acknowledged solution to this dilemma is to relate environmental obligation to the payment of fair costs of restoration or reinstatement (both falling under the term “remedial measures”), or preventative measures.

Remedial measures in relation to land use should aim at removing or curtailing contamination, and preventing or reducing exposure. This can be achieved through the following remedial strategies:
a. Excavation of the contaminated soil with subsequent off-site (ex-site) or on-site treatment.
b. In-situ treatment of soil and groundwater.
c. Pumping groundwater near the surface.
d. Construction measures for reducing indoor air exposure to volatile contaminants.
e. Equipment to prevent or reduce exposure in the outdoor environment, and to prevent contamination from spreading.
Furthermore, exposure can be reduced by changing or adapting land use to the actual conditions.

All these measures should of course be based on a thorough analysis of the site in question and neighbouring areas.