

The Scope of Environmental Crime in International Law

KHODJA SOFIANE

The Faculty of Law, University of Algiers 1 Benyoucef Benkhedda.

sofiane.khodja16@gmail.com

MORSLI MOHAMED

The Faculty of Law and Political Science - The University of Ghardaia

Laboratory of Law and Society in the Digital Space

morsli.mohamed@univ-ghardaia.edu.dz

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Abstract

This study examines the scope of environmental crime in international law through the analysis of two foundational elements: the protected legal interest and the threshold of seriousness justifying criminalization. It proceeds from the premise that environmental criminalization derives its legitimacy only where it rests upon a precise identification of the value being protected, whether as an extension of human rights and public health or as an autonomous ecological interest. The study further addresses the issue of the limits of criminal intervention, distinguishing between regulatory violations, civil liability, and criminal offenses, and analyzing the criteria of seriousness in terms of scale, duration, and the distinction between risk and actual harm. It concludes that constructing a coherent concept of environmental crime requires a careful balance between effective environmental protection and the guarantees of legality and legal certainty, ensuring deterrent effectiveness without resulting in over-criminalization or normative ambiguity.

Keywords: Environmental crime – criminal threshold – environmental risk – serious harm – environmental justice.

Introduction

The criminalization of environmentally harmful conduct has undergone a qualitative transformation in contemporary legal discourse not because such conduct is inherently new, but because the magnitude of its consequences, the complexity of its patterns, and its temporal and spatial extensions have surpassed traditional conceptions of harm and infringement. Whereas environmental matters were historically addressed, in many legal systems, through administrative regulation, technical oversight, and civil compensation, it has become increasingly untenable to ignore that certain forms of environmental damage now produce consequences that affect the foundations of social, economic, and public health systems, undermine structural stability, and deplete natural resources in a manner that threatens human security itself.

Yet the transition from the notion of an “environmental violation” to that of an “environmental crime” cannot occur by mere policy preference or generalized protective impulse. Criminalization, by its very nature, is a highly sensitive normative act: it shifts conduct from

the sphere of regulation to that of stigma and punishment and establishes criminal liability that can arise only upon clear and well-defined foundations.

In this context, determining the scope of environmental crime rests upon two interrelated and central questions: What interest does criminalization seek to protect? And at what point does environmental interference become deserving of criminal punishment? Criminalization is justified only when directed toward the protection of a legal interest of sufficient weight to warrant penal intervention; otherwise, criminal law risks devolving into an instrument of administrative enforcement or boundless moral discourse. Accordingly, examining the protected legal interest in environmental crime is not an abstract theoretical exercise, but rather the logical prerequisite for defining the breadth or narrowness of criminalization.

Does criminal protection target the environment insofar as it constitutes the framework for human rights, public health, property, and public order? Or does it protect the environment as an autonomous legal value possessing independent ecological content? Can these dimensions be reconciled without engendering contradiction or ambiguity? The answers to these questions determine the identity of the “victim” in environmental crime and whether criminal protection is contingent upon proof of direct human harm or may extend to safeguarding ecosystems even in the absence of immediate human impact.

The determination of the protected interest further raises a structural issue concerning the position of the environment between national sovereignty and shared interests. The environment is not invariably a purely domestic matter, as pollution and ecological degradation may transcend borders, affect shared resources, and disrupt regional or global balances. At the same time, the principle of sovereignty cannot readily be displaced from the existing legal order. Thus, identifying the protected legal interest in environmental crime requires a normative construction that distinguishes between protection confined to national jurisdiction and protection necessitating a broader conception attentive to the transboundary character of environmental harm without leading either to excessive criminalization lacking precise foundations or to undue restriction that creates punitive gaps in the face of serious environmental offenses.

If defining “what we protect” constitutes the first question, the second is no less sensitive: At what point does environmental harm reach a degree that removes it from the realm of regulation or compensation and places it within the domain of criminal law? Environmental crime cannot encompass every regulatory breach or normative infraction, lest the concept of “seriousness” that justifies recourse to criminal law as a measure of last resort be emptied of meaning. It is therefore necessary to determine a “threshold of seriousness” as a demarcation criterion separating different levels of responsibility: What remains subject to administrative sanctions? What is appropriately addressed through civil compensation or restorative measures? And what warrants criminal punishment due to its gravity, scope, duration, or because it creates an intolerable risk?

Drawing this threshold is not a mere linguistic exercise but a normative construction that defines the scope of criminalization and grounds the possibility of fair judicial application.

The difficulty of defining the threshold of seriousness in the environmental field is compounded by the fact that environmental harm is often cumulative, multi-sourced, and latent in

manifestation. It may result from a series of individually minor acts which collectively lead to large-scale degradation. Moreover, seriousness is not measured solely by the extent of material loss, but by the nature of the affected ecosystem, its capacity for recovery, the long-term effects involved, the geographical spread of the damage, and whether the harm is reversible or becomes permanent. Accordingly, the criterion of “widespread” harm is qualitative rather than merely spatial, and the criterion of “long-term” relates to structural impact on ecological systems rather than to a mere numerical count of years.

A further decisive issue arises in distinguishing between actual harm and the creation of risk: Should environmental crime arise only where serious damage has already occurred? Or is the existence of a serious risk, grounded in objective indicators rendering the occurrence of harm highly probable, sufficient? This distinction lies at the heart of criminal justice, as it determines whether criminalization punishes outcomes alone or also the creation of unacceptable risks where awareness of the danger exists and the capacity to avoid it was available.

The combined analysis of the two axes namely, the protected legal interest and the threshold of seriousness reveals that the scope of environmental crime is not established by a single legislative act, but through a precise normative architecture linking the object of protection to the limits of penal intervention. Environmental criminalization fails if it lacks a clear foundation in identifying the protected interest, and it fails equally if it lacks a clear threshold distinguishing administrative or civil liability from criminal responsibility. An unrestrained expansion of the protected interest risks normative ambiguity that undermines the principle of legality, whereas an excessively elevated threshold may hollow out criminalization and render proof of the offense virtually unattainable.

Between these extremes lies the need for a coherent conception: one that acknowledges the specificity and cumulative nature of environmental harm, balances effective protection with legal certainty, defines the scope of criminalization in a manner conducive to fair judicial application, and avoids sliding into symbolic or selective criminalization.

Accordingly, this study proceeds from the necessity of reconstructing the scope of environmental crime upon a dual foundation: a precise determination of the legal interest targeted by criminal protection, and a strict definition of the threshold of seriousness justifying the transition from regulatory and compensatory mechanisms to criminalization and punishment thereby ensuring environmental protection without compromising the principles of legality, proportionality, and criminal justice.

The research article is therefore structured around the following central problem:

How can the scope of environmental crime be normatively defined in a disciplined manner, based on a clear definition of the protected legal interest and a precise determination of the threshold of seriousness and the criterion of dangerousness, so as to practically distinguish between regulatory violations, civil liability, and criminal offenses, and to ensure effective environmental protection without undermining the principle of legality and legal certainty? This question will be addressed in the analysis that follows.

Part I: Criminal Protection of the Environment

The first axis of our study addresses the identification of the legal interest that justifies the criminalization of conduct harmful to the environment, as the theoretical foundation for

determining the scope of environmental crime. It examines whether the environment is protected as a means of safeguarding human rights and public health, or rather as an independent ecological value in its own right. It also discusses how this determination affects the breadth or narrowness of criminalization and the limits of criminal law intervention. In addition, it addresses the relationship between national sovereignty and the transboundary nature of environmental harm. The axis concludes that clearly defining the protected interest is a fundamental prerequisite for constructing a disciplined regime of environmental criminalization consistent with the principle of legality.

1- The Legal Interest as a Basis for Environmental Criminalization

The concept of the “legal interest” (Rechtsgut) constitutes one of the principal theoretical pillars of modern criminal law. It is not conceivable to criminalize an act unless it entails an infringement of a specific legal interest that the legal order deems worthy of penal protection. Criminalization is not a purely regulatory tool; rather, it is an exceptional intervention aimed at safeguarding fundamental values. This necessarily requires that its scope be delineated with precision, so that it does not become an open-ended instrument for expanding the State’s punitive authority¹. Comparative legal scholarship has affirmed that identifying the protected interest operates as a limiting criterion on the legislature and as a safeguard against over-criminalization, such that the mere breach of a regulatory norm is insufficient to constitute a crime absent actual or potential impairment of a legally recognized interest².

When this framework is transposed to the environmental field, the central question concerns the nature of the interest to be protected: Is the environment itself an autonomous legal interest, or is it merely the framework through which other interests such as public health and property are protected? The answer to this question directly determines the scope of environmental crime. Confining protection to traditional human-centered interests narrows criminalization to acts that can be shown to have directly harmed individuals, whereas recognizing the environment as a value in itself opens the door to criminalizing conduct that disrupts ecological balance even in the absence of immediate human harm³.

The development of international environmental law reveals a gradual trend toward recognizing the environment as an independent object of protection. Legal discourse is no longer limited to protecting human beings from pollution; it increasingly speaks of safeguarding ecosystems and biodiversity as ends in themselves⁴. However, translating this recognition into a penal foundation requires particular caution, because criminal law demands a precise definition of

1 Antonio Cassese, *International Criminal Law*, 2nd ed., Oxford University Press, 2008, pp. 21–23.

2 Jane Holder & Maria Lee, *Environmental Protection, Law and Policy: Text and Materials*, 2nd ed., Cambridge University Press, 2007, pp. 45–47.

3 Patricia Birnie, Alan Boyle & Catherine Redgwell, *International Law and the Environment*, 3rd ed., Oxford University Press, 2009, pp. 3–6.

4 Alina Kaczorowska-Ireland, *Public International Law*, 5th ed., Routledge, 2015, pp. 310–312

both the material and mental elements of the offense, and cannot rest on broad values or purely ethical considerations⁵.

It follows that defining the scope of environmental crime is closely dependent upon defining the protected legal interest: an uncontrolled expansion of that interest may produce over-criminalization contrary to the principle of legality, whereas an excessively restrictive approach may deprive environmental protection of meaningful criminal effect⁶.

2- Human Rights and Public Health Dimensions of the Environment

The functional approach to defining the protected legal interest in environmental crime rests on the proposition that the environment is not protected for its own sake, but rather as a necessary condition for the enjoyment of fundamental human rights foremost among them the right to life, the right to health, and the right to an adequate standard of living. Developments in international human rights law have increasingly recognized the organic link between environmental degradation and the violation of basic rights, such that severe environmental harm is sometimes construed as a direct infringement of the right to life or the right to health⁷. This interdependence supports the view that criminal protection of the environment may be grounded in the safeguarding of human dignity and bodily integrity, thereby conferring a clearly rights-based dimension upon criminalization.

This approach has developed markedly in contemporary rights-oriented scholarship, in which the environment is no longer viewed merely as an element of public policy but as an objective precondition for the effective enjoyment of fundamental rights. This has led some scholars to argue that environmental destruction may, in certain cases, reach the level of impairing the very essence of the right to life⁸. From this perspective, environmental crime becomes, indirectly, a crime against the human person, and its scope is assessed by the extent of its impact on individual or collective rights rather than by abstract disturbance of the ecological order.

Moreover, many international environmental treaties while not expressly adopting a criminal law formulation emphasize that the ultimate aim of environmental protection is to secure human welfare, health, and safety, thereby reinforcing a functional reading of the protected interest⁹. Under this conception, the scope of environmental crime remains tied to demonstrating harm or a serious risk affecting human health, food security, or physical safety.

Nevertheless, despite its strengths, this functional foundation raises a significant difficulty: it may exclude from the scope of criminalization certain forms of environmental harm whose

5 Antonio Cassese, *International Criminal Law*, 2nd ed., Oxford University Press, 2008, pp. 35–38.

6 Mark Wright, *Responding to Environmental Crimes: Lessons from New Zealand*, Palgrave Macmillan, 2021, pp. 12–15.

7 Ben Boer, *Environmental Law: Dimensions of Human Rights*, Oxford University Press, 2015, pp. 54–57.

8 Aaron Xavier Fellmeth, *Paradigms of International Human Rights Law*, Oxford University Press, 2020, pp. 211–214.

9 Patricia Birnie, Alan Boyle & Catherine Redgwell, *International Law and the Environment*, 3rd ed., Oxford University Press, 2009, pp. 255–259.

direct effects on humans do not appear in the short term, such as the extermination of animal species or the destruction of remote ecosystems. Linking criminalization exclusively to human harm may therefore unduly narrow penal protection, contrary to the increasingly preventive character of environmental law¹⁰.

Furthermore, criminal law doctrine cautions against transforming every environmentally relevant regulatory breach into a criminal offense under the pretext of protecting human rights, as this would empty the principle of *ultima ratio* of its content. Penal protection must remain confined to conduct reaching a degree of seriousness that justifies punitive intervention¹¹. Accordingly, while the functional approach is important for justifying criminal protection in grave cases, it is insufficient on its own to define a comprehensive and disciplined scope of environmental crime; it must be integrated with a broader conception recognizing the intrinsic value of the environment without compromising the requirements of criminal legality.

3- The Environment as an Autonomous Legal Value

The approach based on the intrinsic value of the environment represents a significant conceptual shift in defining the scope of environmental crime. It does not condition criminal protection upon direct harm to humans, but proceeds from the recognition of ecological systems as legal interests in their own right. The development of international discourse on “biodiversity” and “ecosystem integrity” has contributed to entrenching this conception, as international instruments increasingly focus not only on human welfare but also on preserving ecological equilibrium itself¹². Certain doctrinal trends in environmental criminal law further maintain that serious attacks on ecological systems constitute violations of a collective value that transcends individual interests, thereby justifying criminal intervention even in the absence of immediate human harm¹³.

This approach is reinforced by critical scholarship on environmental crimes, which describes the environment as a “silent victim” subjected to systematic conduct whose effects should not be assessed solely by reference to human injury, but also by reference to disturbances of natural balance¹⁴. Studies in environmental criminology similarly suggest that an exclusive focus on human victims tends to underestimate the true magnitude of environmental harm, particularly in crimes associated with deforestation or the illicit trade in wildlife¹⁵.

10 Jane Holder & Maria Lee, *Environmental Protection, Law and Policy: Text and Materials*, 2nd ed., Cambridge University Press, 2007, pp. 301–305.

11 Antonio Cassese, *International Criminal Law*, 2nd ed., Oxford University Press, 2008, pp. 35–37.

12 Patricia Birnie, Alan Boyle & Catherine Redgwell, *International Law and the Environment*, 3rd ed., Oxford University Press, 2009, pp. 116–118.

13 Antonio Cassese, *International Criminal Law*, 2nd ed., Oxford University Press, 2008, pp. 57–60.

14 David R. Goyes, *Southern Green Criminology: A Science to End Ecological Discrimination*, Emerald Publishing, 2019, pp. 87–90.

15 Richard Wortley & Lorraine Mazerolle, *Environmental Criminology and Crime Analysis*, Willan Publishing, 2008, pp. 5–9

However, acknowledging the intrinsic value of the environment raises a fundamental challenge to legal certainty. It becomes necessary to determine when interference with an ecological system is sufficiently serious to warrant criminalization and what objective criteria should be used to measure such interference, so as to avoid transforming criminal provisions into broad formulas susceptible to expansive interpretation¹⁶. Consequently, expanding the scope of environmental crime on the basis of the environment's intrinsic value must be coupled with scientifically and legally precise thresholds that ensure a balance between protection and legality¹⁷.

4- Environment Between Sovereignty and Humanity

The scope of environmental crime cannot be determined without addressing the complex relationship between State sovereignty over natural resources and the transboundary character of many environmental harms. Traditional international law entrenched the principle of permanent sovereignty over natural resources, granting States authority to regulate the exploitation of resources within their territories¹⁸. However, the evolution of international environmental law introduced concepts that qualify this sovereignty, such as the “common concern of humankind” and the “common heritage of mankind,” reflecting an increasing awareness that certain environmental harms transcend national borders¹⁹.

This development has raised questions as to whether acknowledging the shared character of certain environmental resources may ground a criminal obligation that extends beyond the State, particularly where resource exploitation produces transboundary harm or damages a global ecological system²⁰. Nevertheless, converting such recognition into international criminalization requires a clear legal basis, as the ethical or political nature of a “common interest” is insufficient, on its own, to establish international criminal responsibility²¹.

Accordingly, the scope of environmental crime must strike a balance between respect for national sovereignty and the need to ensure effective protection of the environment in matters of international concern, such that uncontrolled expansion does not undermine the traditional

16 Jane Holder & Maria Lee, *Environmental Protection, Law and Policy: Text and Materials*, 2nd ed., Cambridge University Press, 2007, pp. 91–95

17 Mark Wright, *Responding to Environmental Crimes: Lessons from New Zealand*, Palgrave Macmillan, 2021, pp. 22–27

18 Alina Kaczorowska-Ireland, *Public International Law*, 5th ed., Routledge, 2015, pp. 319–322

19 Patricia Birnie, Alan Boyle & Catherine Redgwell, *International Law and the Environment*, 3rd ed., Oxford University Press, 2009, pp. 121–124

20 Kenneth S. Gallant, *International Criminal Jurisdiction: Whose Law Must We Obey?*, Oxford University Press, 2010, pp. 145–149

21 Antonio Cassese, *International Criminal Law*, 2nd ed., Oxford University Press, 2008, pp. 338–342

foundations of the international order, while excessive restriction does not create an accountability gap in the face of grave environmental harm²².

5- Legality and the Limits of Environmental Protection

The principle of legality (*nullum crimen sine lege*) remains the paramount constraint upon any expansion of environmental criminalization. It requires that the constituent elements of the offense be defined with precision, and that the prohibited conduct be clear and foreseeable to those subject to the law²³. The more the protected legal interest is broadened to include general values such as “ecological balance” or “ecosystem integrity,” the greater the risk of ambiguity in determining the boundary between lawful conduct and criminalized conduct.

Environmental criminal law scholarship has warned that an uncontrolled expansion of the protected interest may lead to over-criminalization and to the transformation of criminal law into a general regulatory instrument, contrary to its exceptional nature²⁴. Likewise, reliance on broad concepts without objective thresholds of seriousness may expose criminal provisions to constitutional challenge or render them inconsistent with the requirement of legal certainty²⁵.

Therefore, constructing a disciplined concept of the protected legal interest in environmental crime requires combining recognition of the importance of environmental protection with the precise articulation of the offense’s elements, including a clear seriousness standard, careful definition of the mental element, and delineation of jurisdictional scope so that an appropriate balance is achieved between effective protection and criminal legality²⁶.

Part II: The Criterion of Environmental Criminalization

This second axis addresses the determination of the seriousness threshold that justifies moving environmentally harmful conduct from the realm of a mere violation into the domain of a criminal offense. It analyses the criteria of environmental dangerousness in terms of the gravity of harm, its scale, its duration, and the possibility of treating conduct as constituting a serious risk even before the prohibited result materializes. It also discusses the role of the “last resort” principle in delimiting the boundaries of penal intervention. Further, it highlights the challenges associated with incorporating scientific standards into legal assessment without undermining legal certainty. It concludes that defining a clear seriousness threshold is an essential condition for ensuring the effectiveness of criminalization and preventing over-criminalization.

1- The Last Resort and the Boundaries of Criminalization

22 Jane Holder & Maria Lee, *Environmental Protection, Law and Policy: Text and Materials*, 2nd ed., Cambridge University Press, 2007, pp. 68–72; Mark Wright, *Responding to Environmental Crimes: Lessons from New Zealand*, Palgrave Macmillan, 2021, pp. 41–44

23 Antonio Cassese, *International Criminal Law*, 2nd ed., Oxford University Press, 2008, pp. 35–39

24 Mark Wright, *Responding to Environmental Crimes: Lessons from New Zealand*, Palgrave Macmillan, 2021, pp. 47–48

25 Jane Holder & Maria Lee, *Environmental Protection, Law and Policy: Text and Materials*, 2nd ed., Cambridge University Press, 2007, pp. 93–96

26 Patricia Birnie, Alan Boyle & Catherine Redgwell, *International Law and the Environment*, 3rd ed., Oxford University Press, 2009, pp. 18–22; Alina Kaczorowska-Ireland, *Public International Law*, 5th ed., Routledge, 2015, pp. 325–329

Determining the seriousness threshold in environmental crime is indispensable to delimiting its scope, given that criminal law being an exceptional coercive instrument must not be invoked unless regulatory or civil mechanisms have proven insufficient to secure the required level of protection. This logic is embodied in the principle of *ultima ratio*, which requires that criminalization remain confined to conduct reaching a degree of dangerousness that justifies the State's recourse to its most severe punitive instruments²⁷. In the environmental context, this principle assumes heightened importance, since many environmentally harmful acts may be adequately addressed through administrative or civil measures without resorting to criminal punishment.

The challenge, however, lies in identifying the point at which environmental harm ceases to be a mere regulatory breach and rises to the level of a criminal offense. Not every exceedance of an emissions standard or breach of an industrial licensing condition can amount to a crime, otherwise criminal law would become a tool of general administrative enforcement, contrary to its exceptional nature²⁸. Environmental legal scholarship has cautioned against the risk of "penal inflation" in the absence of a clear seriousness threshold, arguing that excessive criminalization may weaken rather than strengthen criminal legality²⁹.

At the international level, this concern for a higher threshold appears clearly in the wording of certain provisions addressing environmental harm, which require that the damage be "widespread, long-term and severe," reflecting an intention to confine criminalization to exceptional cases of high gravity³⁰. Public international law scholarship likewise emphasizes that expanding criminal responsibility without a precise seriousness threshold may disturb the balance between protection and legal certainty³¹.

2- Conceptual Delimitation of Severe Harm

The concept of "severe harm" in environmental matters raises a particular difficulty, because seriousness is not assessed solely by the extent of direct material loss, but also by the nature of the affected ecosystem, the sustainability of the impact, and the possibility of reversal. Harm that may appear economically limited can be environmentally catastrophic if it affects a fragile system or an endangered species³². Accordingly, determining severity requires incorporating scientific criteria into legal evaluation, without transforming the criminal judge into an environmental expert.

27 Antonio Cassese, *International Criminal Law*, 2nd ed., Oxford University Press, 2008, pp. 35–37

28 Jane Holder & Maria Lee, *Environmental Protection, Law and Policy: Text and Materials*, 2nd ed., Cambridge University Press, 2007, pp. 91–93.

29 Mark Wright, *Responding to Environmental Crimes: Lessons from New Zealand*, Palgrave Macmillan, 2021, pp. 41–44

30 Antonio Cassese, *International Criminal Law*, 2nd ed., Oxford University Press, 2008, pp. 338–340

31 Alina Kaczorowska-Ireland, *Public International Law*, 5th ed., Routledge, 2015, pp. 325–327; Patricia Birnie, Alan Boyle & Catherine Redgwell, *International Law and the Environment*, 3rd ed., Oxford University Press, 2009, pp. 18–20

32 Patricia Birnie, Alan Boyle & Catherine Redgwell, *International Law and the Environment*, 3rd ed., Oxford University Press, 2009, pp. 116–118.

Scientific studies on “multiple environmental stressors” have shown that ecosystems may collapse due to the accumulation of factors that, taken individually, appear non-severe. This raises the question whether severity should be assessed on the basis of the individual act or on the basis of cumulative effect³³. This supports the need to rethink severity in environmental crime so that it is not restricted to immediate outcomes but also encompasses scientifically substantiated risks that threaten ecosystem stability.

However, integrating scientific standards into the assessment of severity raises concerns related to the principle of legal certainty: the constituent elements of the offense must be sufficiently clear to enable individuals to foresee criminal liability³⁴. The challenge therefore lies in formulating a standard that combines scientific precision with legal clarity, such that “severe harm” is defined by objective indicators capable of judicial proof³⁵.

3- Delimiting Widespread Harm in Environmental Crime

The seriousness threshold is not limited to the magnitude of harm; it also encompasses its geographic scope and its systematic character. Environmental damage extending across wide areas, or affecting a large number of persons or ecosystems, assumes a different quality from local and limited harm. The requirement of “widespread” damage in certain international texts reflects an understanding that dangerousness is measured not only by intensity, but also by the extent of its reach and its transboundary implications³⁶.

Nevertheless, “widespread” remains a relative concept whose assessment varies according to the nature of the environment concerned. Pollution of a small river may be local in spatial terms, yet it can affect an entire ecological system if the river constitutes the sole water source for a given region³⁷. Likewise, the systematic nature of harm where it results from a policy or repeated practice may raise the level of dangerousness even if no single act is severe in itself³⁸. Accordingly, the “widespread” criterion in environmental crime should be understood as a cumulative element that takes account of the aggregated effects of conduct, rather than mere abstract geographic extension. Yet this understanding must remain governed by standards

33 National Research Council, *Understanding Multiple Environmental Stresses: Report of a Workshop*, National Academies Press, 2007, pp. 1–4.

34 Antonio Cassese, *International Criminal Law*, 2nd ed., Oxford University Press, 2008, pp. 35–39.

35 Jane Holder & Maria Lee, *Environmental Protection, Law and Policy: Text and Materials*, 2nd ed., Cambridge University Press, 2007, pp. 93–96; Mark Wright, *Responding to Environmental Crimes: Lessons from New Zealand*, Palgrave Macmillan, 2021, pp. 22–25

36 Antonio Cassese, *International Criminal Law*, 2nd ed., Oxford University Press, 2008, pp. 338–342.

37 Patricia Birnie, Alan Boyle & Catherine Redgwell, *International Law and the Environment*, 3rd ed., Oxford University Press, 2009, pp. 121–124.

38 David R. Goyes, *Southern Green Criminology: A Science to End Ecological Discrimination*, Emerald Publishing, 2019, pp. 87–92.

capable of proof, so that the notion does not become an unduly flexible concept subject to uncontrolled discretion³⁹.

4- Extended Impact and the Limits of Environmental Liability

The “long-term” criterion is among the most complex elements in defining the threshold of environmental crime, because environmental harm is assessed not only by its immediate intensity but also by its persistence and effects over time. This criterion appears explicitly in certain international formulations requiring that harm be “widespread, long-term and severe,” reflecting an understanding that environmental dangerousness extends beyond immediate outcomes to effects unfolding over years or decades⁴⁰. International scholarship indicates that “long-term” is linked to the difficulty of restoring the status quo ante and to the extent to which the harm is irreparable or the ecological balance cannot be restored⁴¹.

Yet defining what counts as “long-term” raises a normative difficulty, as the assessment varies with the characteristics of the ecosystem in question. Harm may be short-lived in purely temporal terms but may destabilize a sensitive ecological balance that is difficult to restore such as soil contamination by toxic substances or the extinction of animal species⁴². Environmental studies confirm that certain ecosystems require decades to recover if they recover at all making the temporal criterion dependent on the biological capacity for restoration rather than on an abstract number of years⁴³.

Including “long-term” impact as a criterion raises the criminalization threshold by excluding transient or rapidly remediable harms and confining criminal responsibility to conduct undermining the sustainability of the ecological system⁴⁴. However, raising the threshold should not result in excessive restriction that renders the offense difficult to prove, since requiring an overly prolonged permanence may hollow out the deterrent effectiveness of the provision⁴⁵.

Accordingly, “long-term” should be understood as a qualitative not purely quantitative criterion, linked to the sustainability of the environmental impact and the ecosystem’s capacity

39 Mark Wright, *Responding to Environmental Crimes: Lessons from New Zealand*, Palgrave Macmillan, 2021, pp. 41–45; Richard Wortley & Lorraine Mazerolle, *Environmental Criminology and Crime Analysis*, Willan Publishing, 2008, pp. 5–12.

40 Antonio Cassese, *International Criminal Law*, 2nd ed., Oxford University Press, 2008, pp. 338–340.

41 Patricia Birnie, Alan Boyle & Catherine Redgwell, *International Law and the Environment*, 3rd ed., Oxford University Press, 2009, pp. 116–120.

42 Jane Holder & Maria Lee, *Environmental Protection, Law and Policy: Text and Materials*, 2nd ed., Cambridge University Press, 2007, pp. 93–95.

43 National Research Council, *Understanding Multiple Environmental Stresses: Report of a Workshop*, National Academies Press, 2007, pp. 1–4.

44 Mark Wright, *Responding to Environmental Crimes: Lessons from New Zealand*, Palgrave Macmillan, 2021, pp. 22–25.

45 Alina Kaczorowska-Ireland, *Public International Law*, 5th ed., Routledge, 2015, pp. 325–327.

to recover, rather than simply the number of years during which harm persists⁴⁶. This understanding allows the scope of environmental crime to be structured in a manner that balances a heightened criminal threshold with effective protection.

5- Risk and Harm in Defining Environmental Crime

Defining the scope of environmental crime also raises a fundamental question as to whether criminalization requires the occurrence of actual harm, or whether it suffices that there exists a serious risk supported by scientific basis. In traditional crimes, the occurrence of the result often constitutes a key element of *actus reus*. However, the preventive nature of environmental law may justify criminalizing conduct that creates a substantial risk even before harm occurs⁴⁷. This development reflects the precautionary principle, which has become one of the guiding principles of international environmental law⁴⁸.

Nonetheless, incorporating the notion of “risk” into criminal law requires heightened caution. Expanding criminalization to cover mere probabilities may undermine legal certainty and expose individuals to criminal liability based on uncertain future assessments⁴⁹. Criminal law doctrine therefore generally requires that the risk be “serious, specific, and provable,” rather than theoretical or remote.

Recent environmental studies reinforce the proposition that certain industrial or extractive activities generate extremely high risks even before harm materializes, supporting the criminalization of “serious risk” in certain cases particularly where an activity is inherently dangerous and there exists prior scientific knowledge of its hazards⁵⁰. However, such expansion must remain confined by objective criteria ensuring that the risk is imminent and linked to specific conduct, so that it does not become an open-ended instrument of criminalization⁵¹.

Accordingly, the scope of environmental crime is determined through a careful balancing between requiring actual harm and accepting a scientifically established serious risk, while respecting the principle of legality and the necessity of maintaining a heightened criminal threshold consistent with the role of criminal law as a last resort⁵².

46 David R. Goyes, *Southern Green Criminology: A Science to End Ecological Discrimination*, Emerald Publishing, 2019, pp. 87–92.

47 Jane Holder & Maria Lee, *Environmental Protection, Law and Policy: Text and Materials*, 2nd ed., Cambridge University Press, 2007, pp. 91–93.

48 Patricia Birnie, Alan Boyle & Catherine Redgwell, *International Law and the Environment*, 3rd ed., Oxford University Press, 2009, pp. 18–20.

49 Antonio Cassese, *International Criminal Law*, 2nd ed., Oxford University Press, 2008, pp. 35–39.

50 National Research Council, *Understanding Multiple Environmental Stresses: Report of a Workshop*, National Academies Press, 2007, pp. 3–4.

51 Mark Wright, *Responding to Environmental Crimes: Lessons from New Zealand*, Palgrave Macmillan, 2021, pp. 41–44.

52 Alina Kaczorowska-Ireland, *Public International Law*, 5th ed., Routledge, 2015, pp. 325–329; David R. Goyes, *Southern Green Criminology: A Science to End Ecological Discrimination*, Emerald Publishing, 2019, pp. 101–104 .

Conclusion

This analysis leads to an essential conclusion: legal discourse on “environmental crime” is sustainable only if it is rigorously structured around two interdependent criteria one defining the object of criminal protection (the protected legal interest) and another defining the limits of punitive intervention (the seriousness threshold). Criminalization in the environmental field is not merely an expression of moral anxiety or a political desire for deterrence; it is a strict normative construction that requires the prohibited conduct to be defined with precision, the protected value to be specified, and the boundaries between administrative regulation, civil compensation, and criminal punishment to be clearly delineated. Without such structuring, “environmental crime” risks becoming an elastic slogan: either expanding to absorb every regulatory infraction or, conversely, setting its standards so high that it becomes practically unenforceable, leaving protection stranded between penal inflation and punitive void.

The analysis of the protected legal interest reveals an unresolved structural tension: is the aim to protect human beings through environmental protection, to protect the environment for its own sake, or to combine both within a single framework? A purely functional model may appear more consistent with classical criminal law traditions, yet it risks reducing the environmental question to measurable “human harm,” thereby excluding profound ecological harms that do not immediately manifest as direct human loss. Conversely, adopting the intrinsic protection of the environment responds more directly to the nature of contemporary environmental risk and elevates normative ambition, but it confronts the tests of legality and legal certainty: how can “ecosystem integrity” be translated into determinate criminal elements capable of proof? How can the protected interest be prevented from turning into an elastic concept that invites broad and unstable interpretation? This tension is not merely theoretical; it directly affects the fair enforceability of legal texts and the limits of judicial interpretive authority.

On the other hand, the seriousness threshold exposes a highly sensitive practical challenge. Raising the threshold excessively, under the pretext of confining criminalization to exceptional cases, may lead to near-impossibility of proof particularly in cases characterized by complex causation, cumulative effects, and conflicting scientific reports. Conversely, lowering the threshold in response to environmental necessity may produce expansive criminalization inconsistent with the “last resort” principle and transform criminal law into an administrative extension of regulatory sanctions. The core challenge lies in constructing a threshold that is not reduced to broad terminology, but formulated in a manner that enables objective measurement of severity and provides courts with workable criteria to assess scale, duration, and risk without allowing science to replace the legal standard or turning the law into a hostage of scientific uncertainty.

The institutional setting further complicates the picture. A substantial portion of serious environmental harm occurs in contexts where State authority intersects with major economic interests, where oversight is weak, in situations of armed conflict, or within regulatory environments marked by fragility and corruption. In such contexts, the limits of criminalization become apparent if it remains confined to legislative text without an operational conception of investigation, evidence-gathering, jurisdictional arrangements, and judicial capacity to handle

technically complex files. The problem of “selectivity” also emerges where criminalization is enforceable against certain actors but not others, in certain States but not others, or where the discourse of environmental protection becomes criminal in form yet symbolic in practice.

Accordingly, the central critique advanced by this study is that environmental criminalization should not be evaluated solely by the breadth of the criminalized field or the severity of punishment, but by the coherence of its normative structure and its capacity for fair enforcement. Where environmental crime is not built upon a clear definition of the protected interest and a precise, provable seriousness threshold, it will oscillate between two unsatisfactory models: an inflated regulatory-penal model that consumes criminal legality and weakens deterrence, and an overly rigid normative model that renders criminalization exceptional on paper and ineffective in practice. The more balanced path does not lie in mechanically expanding or restricting criminalization, but in re-engineering the concept of environmental crime so that it aligns with the nature of contemporary environmental harm while preserving the safeguards and foundational principles of criminal law.

Ultimately, the need is confirmed for a critical legal approach that is not deceived by appearances: environmental protection is not achieved merely by declaring criminalization, nor by escalating rhetoric, but by grounding criminalization in a clear normative logic, defining its elements and limits, preparing realistic conditions for enforcement, and shielding it from sliding into vagueness or selectivity. Only then can “environmental crime” shift from an attractive protective label into an effective, fair, and disciplined legal instrument—capable of deterrence without sacrificing legality, and capable of protecting the environment without reducing it to a mere collateral effect of other interests.

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