

Crimes that Affect the Environment and Climate Change



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United Nations Office on Drugs and Crime



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United Nations Office on Drugs and Crime (UNODC) and World Wildlife Fund (WWF) are working in partnership to reduce the occurrence of crimes that affect the environment and their impact on marine and terrestrial ecosystems



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Summary

Protecting natural ecosystems and their ability to sequester and store atmospheric greenhouse gases is a vital component to mitigating climate change. Article 5.1 of the Paris Agreement calls on the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) to conserve and enhance sinks and reservoirs of greenhouse gases.¹ Article 7 of the Paris Agreement states that protecting these systems is crucial to increasing the resilience of nature to withstand the impacts of climate change including desertification, heat waves, floods and biodiversity loss.

The Intergovernmental Panel on Climate Change (IPCC) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) issued warnings that the decline in nature's ability to sequester carbon and adapt to climate impacts continued.² A contributing cause to this decline is the rise in crimes affecting the environment, including but not limited to offences linked to deforestation, marine pollution, wildlife trafficking, poaching, fishery crimes and waste trafficking.

These trends impair the resilience of natural ecosystems to withstand climate change, contribute to the decline of biodiversity, and facilitate the release of carbon dioxide (CO₂) and other harmful gases into the atmosphere.

To support nature's ability to mitigate climate change, it is critical to scale up initiatives to combat environmental crime and integrate the justice system's response to these crimes into biodiversity, climate and circular economy agendas.

Introduction

As pressure grows to respond to the climate crisis, so too does the recognition that this response needs to be multidimensional, including by stepping up the efforts to protect biodiversity.³ Although previously treated separately, the two issues are integrally linked. As climate change accelerates biodiversity loss, that loss in turn accelerates climate change by impeding the integrity of nitrogen, carbon and water feedback cycles. This concern is reflected in climate and biodiversity related fora.⁴ Most recently, the Glasgow Climate Pact (2021) reinforced the importance of protecting, conserving and restoring nature and ecosystems to achieve the Paris Agreement temperature goal, including through the role of forests and other terrestrial and marine ecosystems as sinks of greenhouse gases.⁵

Achieving these objectives requires that ecosystems be adequately protected by the enforcement of laws limiting greenhouse gases emission. Given the current growth in environmental crime, particularly transnational and organised environmental crime, a more effective justice system response is needed, one that is able to consider climate change in its decision-making processes and address the impact of crime on biodiversity.⁶

In line with the UN Common Approach to Biodiversity (2021), a comprehensive approach to biodiversity is needed that includes a strong justice system response in relation to environmental crime.⁷ The urgency to address crimes that affect the environment has been raised at international environmental fora, the UN General Assembly and UN crime prevention and criminal justice fora. Recent outcomes include: Stockholm+50 discussions including a stronger justice system response to crimes that affect the environment⁸; UNEA-5.2 Ministerial Declaration (2022)⁹ commitment to address crimes that have a serious impact on the environment; UN General Assembly resolution 76/185 “Preventing and combating crimes that affect the environment” (2022)¹⁰; Kyoto Protocol on Advancing Crime Prevention, Criminal Justice and the Rule of Law (2021) expressing concern of the negative impact of crimes that affect the environment;¹¹ resolution 10/6 “Preventing and combating crimes that affect the environment falling within the scope of the United Nations Convention against Transnational Organized Crime” of the Conference of the parties to the United Nations Convention against Transnational Organized Crime (2020).

In short, environmental crime impedes the transition to a more resilient and climate neutral society. Reference to environmental crime, however, is largely absent from the climate agenda. This is likely due to the fact that most activities contributing to climate change are caused by lawful behaviour and, as such, the predominant international response has been to use incentives rather than enforcement.

Climate change is also absent from the criminal justice system space and environmental crime is generally perceived as less serious than other criminal activities. Further, when climate related cases are brought to courts, they are primarily handled by civil and administrative litigation rather than using criminal law.¹² There are various factors that contribute to this reality, but the limited application of criminal law in the case of environmental crimes indicates that they are not being treated as serious crimes, despite growing international calls.¹³

As the impacts of climate change and biodiversity loss become more visible, public pressure to address these threats continues to grow, as does the need for a better understanding of the nexus between environmental crime and the role of the criminal justice system in the climate agenda. This necessitates a multi-disciplinary review to better understand the links between the climate and the justice system space, and to assess what tools are available to better respond to climate change.

This discussion paper will argue that integrating criminal justice and law enforcement efforts into the climate agenda will improve ecosystem-based climate mitigation efforts, reduce environmental crime and strengthen ecosystems resilience. For the purpose of this paper, ecosystems resilience refers to the capacity of an ecosystem to resist and recover from a disturbance maintaining its original functionality.¹⁴ The discussion paper will further review how climate considerations can be better integrated into law enforcement and criminal justice system processes, and scan the horizon on what the potential impact of climate may be on the rule of law.

The discussion paper was prepared by the United Nations Office on Drugs and Crime (UNODC), with the support of World Wildlife Fund (WWF). UNODC and WWF would like to thank consultants Matthew Brubacher and Caio Borges for writing the paper, and wish to thank the wide range of experts and practitioners who contributed their time and effort to the development of this exploratory research.

Key research questions

To examine how the criminal justice system can more effectively contribute to preventing the loss in natural resources and biodiversity, so that they can maintain their integrity under a changing climate and to understand how crime itself contributes to and is affected by climate change, this discussion paper will explore the following questions:

- 1. Which environmental crimes are the most harmful to climate and ecosystem resiliency?
- 2. When does law enforcement and criminal justice become an effective mechanism to contribute to climate mitigation efforts?
- 3. How does the criminal justice system integrate climate change into its considerations?
- 4. What challenges need to be addressed and what support needs to be provided to enhance the role of the criminal justice system to address climate change more effectively?
- 5. How is climate change affecting crime and law enforcement?



The scope of research and limitations

Given a broad range of important considerations for the climate agenda, this discussion paper will be limited in scope. While corruption and other economic crimes associated with environmental crime and the climate agenda are important considerations, they require separate dedicated research. Other important areas such as the concept of ecocide, climate and security considerations are outside the scope of the paper. Only the most impactful environmental crimes are addressed in this paper, and it therefore makes no claims to exhaustive analysis. Likewise, the criminal justice considerations outlined are not exhaustive. Although the discussion paper does not thoroughly explore the link between gender inequality and crimes that affect the environment, it is recognised that for criminal justice systems to combat these crimes effectively, the link between gender inequalities, human rights and climate change needs to be addressed.

Key Findings

1 Climate change requires a multidisciplinary response

The process of responding to climate change is inherently multidimensional. It requires a diverse set of actors, each with specialised expertise, to work collaboratively to address a common problem. During consultations conducted for this research, diverse experts recognized the threat of climate change, biodiversity loss and environmental crime. The specific framing of the issues provided by different experts mirrored the specificities of their professional background providing the building blocks from which a holistic, cross-disciplinary approach can be developed.

While climate scientists focus on measuring greenhouse gas emissions and the impact of climate change on the health and ability of ecosystems to regulate those emissions, biodiversity experts focus on the effect climate change is having on biodiversity and the growing extinction of species. Social scientists see climate change as contributing to social and political stress, which may increase conflict and crime rates, while legislators and policy makers view climate change in a broader context of political and development interests. The view is different for those in the criminal justice system who, if they consider climate change, often do not have the tools to differentiate the impacts that crimes have on ecosystem resiliency, biodiversity loss or on greenhouse gas emissions.

The differences in vantage points are understandable, but the disparity can inhibit cross disciplinary cooperation. Cooperation requires an appreciation of the views and contributions of other disciplines as well as a common language. The process of bridging agendas is starting to take place. Climate science actors, including those in the IPCC, are now collaborating more closely with biodiversity experts, including IPBES.⁹² Climate change as a conflict multiplier is also increasingly acknowledged across disciplinary boundaries. Although currently in the margins, this burgeoning dialogue means that crimes that affect the environment will likely feature more prominently as the international focus on protecting the environment increases.

The integration of crimes that affect the environment into other disciplines is important not only to create the desired synergies resulting from a collaborative response, but also to avoid inadvertent maladaptation. Not all crimes have the same impact on the climate or ecosystems. Additionally, while criminalizing illegal behaviour contributing to climate change is important, it should not detract from, or mischaracterize the fact that, the vast majority of climate change and biodiversity loss is caused by entirely lawful means.

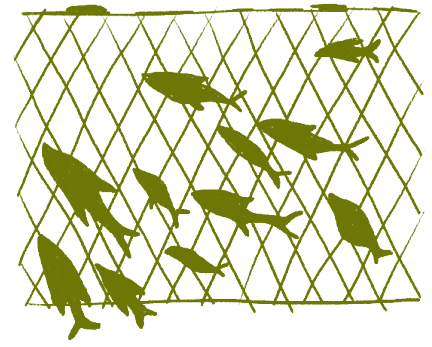
Multidimensional dialogue on climate change and crime



2 Crimes that affect the environment and climate change response

The following is a brief list of environmental crimes that impact the environment and global climate change. This is not an exhaustive list. However, it provides concrete examples of why it is essential to include environmental crime in the biodiversity- climate discussions, and why the justice system needs to factor in climate change when considering litigation for environmental offences.

Crimes affecting coastal and marine ecosystems



Oceans have the highest capacity for carbon sequestration. Due to their size and mass, oceans absorb a third of anthropogenic CO₂ and they sequester that carbon, often for very long periods of time, on the seabed.¹⁵ Oceans also absorb 90% of the heat created by global warming and produce 50% of the world's oxygen.¹⁶ Oceans take carbon out of the atmosphere primarily when atmospheric CO₂ dissolves in the water but also as aquatic plants take in carbon dioxide from the air or water through photosynthesis.

While oceans have a certain capacity to absorb CO₂, which becomes carbonic acid when it reacts with water, there are limits to how much they can absorb. This limit is determined by temperature, pressure and other factors. This absorption service can only continue so long as the carbon is continually taken out of the water.¹⁷ This recycling of carbon occurs either through photosynthesis by aquatic plants or by organisms dying and their bodies falling to the ocean floor. The most impactful organism in this regard is phytoplankton, particularly diatoms. These organisms take out about 40% of total anthropogenic carbon produced, more than all the tropical forests combined.¹⁸

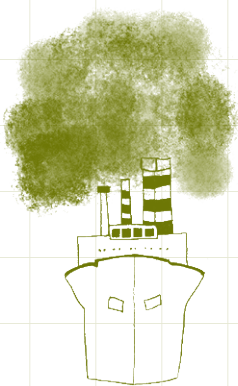
Nearly anything that disrupts these ecosystems diminishes the capacity of the oceans to regulate the climate.¹⁹ Unfortunately, higher temperatures and ocean acidity caused by carbon emissions, when combined with marine pollution, have a higher detrimental impact on marine life.²⁰ Although multiple crimes contribute to this reality, the following are among the most impactful. In the subsequent chapter, the discussion paper provides a rationale for measuring the impact of these crimes and offences on climate.

a Land based marine pollution

Quantitatively, land-based marine pollution, particularly agriculture and sewage runoff, contributes the most to marine pollution.²¹ This pollution stimulates a eutrophication process in the water, lowering oxygen levels which are creating increasingly large 'dead zones' in the oceans. Internationally, although there is no specific reference to land-based pollution, the UN Convention on the Law of the Sea (UNCLOS) does require states "to control pollution of the marine environment from any source," particularly when it affects the interests of other states.²² Domestically, although states are often reluctant to regulate run off waste, the number of regulations is increasing, as are the penalties for infractions.²³ Due to the scope of impact, greater focus on this particular source of pollution will greatly enhance ecosystem protection.

b Ship-source fuel pollution

The burning of fossil fuels by the shipping sector contributes approximately 3% of global emissions.²⁴ Efforts to reduce GHG emissions from shipping primarily focus on increasing incentives to switch to cleaner fuels, such as hydrogen, and to reduce emissions through energy efficiency. As such, regulations are tightening on the type of fuel burned and how it is burned. Recently in 2020, Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL) criminalised the burning of sulphur oxides beyond a specific limit.²⁵ Nitrous oxide pollution, however, has more limited controls, despite it being a much more potent GHG, and nitrous oxide shipping emissions contribute approximately 10% of global emissions - a consideration for further regulatory changes.²⁶ It is also much easier for law enforcement to detect and reduce sulphur oxides in comparison with nitrous oxides, which poses another challenge.²⁷



c Bilge water dumping

Bilge water flows through the ship collecting oil and other pollutants. A cruise ship can produce around 8 tons of bilge water per day.²⁸ Before being released into the ocean, bilge water is supposed to go through an Oily Water Separator (OWS), which allows the ship to store the oil and other pollutants until they can be offloaded on land. Notwithstanding, one of the most common crimes at sea is to bypass this system, often through a technique referred to as the 'magic pipe', dumping the untreated water into the sea disrupting the reproduction process of marine life and inhibiting photosynthesis.²⁹ This practice is relatively common but is illegal according to MARPOL Annex 1.³⁰



Enforcement of laws on bilge water dumping has improved in some areas. In the USA, for example, ships such as the Longshore³¹ and Princess Cruise Line³² were found guilty of a felony, fined and placed on an Environmental Compliance programme probation, supervised by the court. Additionally, in the territorial waters of the European Union in the Mediterranean, due to improved detection capacity and higher penalties, the number of incidents of bilge water pollution reduced from 425 incidents in 2007 to 53 in 2017.³³ This relatively rare success demonstrates the deterrence effect that occurs with the application of regular and consistent enforcement with higher penalties, particularly where the perpetrators are otherwise lawful commercial actors.

d Other pollutants

Large cargo ships often burn a particularly heavy and inexpensive fuel called bunker fuel. The residue left over from bunker fuel after it is burned is considered toxic waste and, according to Annex 2 of MARPOL, needs to be disposed of on land. To avoid the cost, ships may intentionally discharge the residue into the ocean. This also occurs with sewage, ballast water and other waste products, causing damage to the ecosystem and their carbon recycling capacities.³⁴



e Bottom trawling

Bottom trawling refers to the practice of catching fish by dragging heavy nets along the seafloor. This practice negatively affects one of the world's most important carbon sinks – the seabed.³⁵ Bottom trawling causes the carbon stored in the seabed to mix with water, making it more acidic and causing the carbon to rise to the surface where it is released to the atmosphere.³⁶ The practice is also extremely harmful for biodiversity as it destroys the seafloor, including corals,

and traps a high proportion of bycatch which is often discarded. The practice of regulating bottom trawling varies widely, but an increasing number of states are restricting its practice or banning it altogether, making it a potentially criminal offence.³⁷

f Fisheries crime; illegal, unreported, and unregulated fishing

Crimes in the fisheries sector and illegal, unreported, and unregulated (IUU) fishing deplete fish stocks and threaten biodiversity and livelihoods, particularly if done in violation of regulations that are part of Marine Protected Areas (MPAs). Given that the majority of marine life is near the surface of the ocean and near the shores, safeguarding Marine Protected Areas (MPAs) is critical to maintaining biodiversity and its capacity to provide services.³⁸ Protecting MPAs have a triple benefit of protecting biodiversity, boosting fishery yields and securing marine carbon sinks.³⁹ As of 2021, MPAs cover 7% of the ocean and are viewed as critical to maintaining biodiversity as well as the sustainability of the fishing industry.⁴⁰ However, without proper enforcement to protect MPAs, including addressing organised crime in the fisheries industry, illegal practices will continue, affecting the sustainability and conservation approaches to maintain the health of the oceans and the delicate food web which sustains marine life.⁴¹

Forest-related crimes



Forests have a high capacity for carbon sequestration that is lost when harvested unsustainably. Of the 23% of global emissions caused by land use change and agriculture, over half comes from forest degradation.⁴² Forests, especially primary tropical forests, are an important carbon sink as they hold more carbon and a higher biodiversity density. Approximately 2.6 billion tonnes of carbon dioxide, one-third of the CO₂ released from burning fossil fuels, is absorbed by forests every year. In 2020 alone, however, an estimated 12.2 million hectares of tree cover were destroyed in the tropics, a 12% increase from 2019. The destruction and degradation of the world's forests continue at an alarming rate. Cropland expansion, including for palm oil and soybean cultivation, is the main driver of deforestation, causing almost 50% of global deforestation, followed by livestock grazing, accounting for 38.5%.⁴³

The combination of deforestation and temperature rises has already made some forests, such as the Amazon, net emitters rather than carbon sinks.⁴⁴ The danger is that once temperatures reach a critical level, the forests will get to the tipping point and begin an uncontrolled dieback process, wherein tree health progressively deteriorates. Since forests provide habitat for a majority of terrestrial life and are reliant on the services provided by wildlife, in particular with respect to pollination and seed dispersal, this tipping point is also alarming from the perspective of biodiversity loss.⁴⁵

The renewed commitment of states to halt deforestation by 2030 is threatened by a range of interrelated illegal activities which often occur in tandem with legal forestry activities.⁴⁶ These include:

a Illegal deforestation

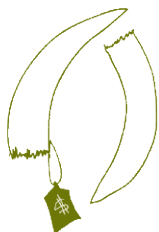
Forest clearance for the purposes of expansion of agricultural land for food production is one of the biggest drivers of forest loss and degradation of ecosystems worldwide. Land grabbing, including indigenous and protected conservations, is often associated with a variety of illegal activities including illegal deforestation. Some countries are adopting controls to reduce deforestation associated with agricultural and agro-forestry production. Examples include France's Duty of Vigilance Law, which makes companies liable for deforestation-related crimes, and the forthcoming EU Regulation on deforestation-free supply chains which precludes goods associated with deforestation from accessing EU markets. Addressing illegal activities associated with deforestation must be a part of the integrated response to curb deforestation and support primary forests' carbon sequestration capacity. It is important to note, however, that the effectiveness of curbing illegal deforestation is dependent on the scope and integrity of the protection regime. This is diminished if countries move to legalize deforestation.

b Illegal logging and trafficking in timber and other forest products

Illegal logging is a major threat to the world's forests and forest biomes. According to the WWF, in some tropical forest areas, illegal logging accounts for 50-90% of all forestry-related activities.⁴⁷ It contributes to both the loss of biodiversity and to climate change, as deforestation and forest degradation leads to emissions of greenhouse gases instead of carbon sequestration. Illegal logging can be linked to conflicts over land and resources, the disempowerment of local and indigenous communities, human rights abuses, corruption, armed conflict and expansion of unsustainable practices. Given the integrated nature of the global market, countering illegal logging will ultimately require all states to not only enforce their own sustainability criteria on forestry but also to assess whether countries of export adhere to these criteria.

c Illegal mining and trafficking in precious metals and stones

Illegal mining and trafficking in precious metals and stones contribute to deforestation and are often accompanied by serious human rights abuses, including against indigenous communities. Illegal mining occurs when mining takes place without the requisite permits, particularly in the absence of land rights and mining licences. It can occur informally, as with artisanal mining, or alongside otherwise legal and large-scale mining by transnational corporations. Due to the lack of oversight, pollution and other impacts on the environment negatively impact ecosystems. Addressing illegal mining and trafficking in precious metals and stones is an important measure to curb deforestation.



d Wildlife trafficking is recognized as a specialized area of organized crime and a significant threat to many plant and animal species - which are all important for the functioning health of ecosystems. An effective justice system and law enforcement response, combined with livelihoods interventions and demand reduction are important considerations to continue addressing this threat and its impact on biodiversity.

e Associated crimes (document fraud, corruption and other crimes) are crimes occurring extensively in the forestry sector and facilitate forest loss, species trafficking and illegal mining. While these crimes are outside of the scope of this discussion paper, they are widely present in the natural resource sector and must be addressed to increase the integrity of the natural resource governance and reduce crime.



Waste trafficking



The 2021 UNFCCC Nationally Determined Contributions (NDC) Synthesis Report found that climate commitments are not on track to meet Paris Agreement goals.⁴⁸ One of the recommendations proposed for states to achieve their mitigation ambitions is to promote the concept of circular economy, including reducing and recycling waste, and addressing waste is a priority area in many national climate mitigation measures. The waste sector is responsible for 10% of GHG emissions. One third of the waste generated globally is mismanaged, with open dumping accounting for about 31% of waste globally and up to 93% in some lower-income countries.⁴⁹

Waste trafficking supports the current linear economic model – ‘make – consume – throw’. In the process of waste trafficking, waste produced in the Global North is being exported to and disposed of in the Global South, undermining the circular economy, producing serious environmental and health impacts in destination countries, and increasing global GHG emissions. Despite bans and restrictions put in place in past years, many developed countries are still exporting their waste problem elsewhere. The challenges faced by waste receiving countries include the lack of traceability of imported waste, mislabelling or misdeclaration of waste, insufficient capacity for enforcement and lack of adequate sanctions for illegal waste trade activities. This increases the opportunity for illegal waste trade.⁵⁰

Reducing the generation of waste, promoting environmentally sound waste management, and disincentivizing transboundary movement of key sources of waste and its trafficking can all be important means to help countries meet their NDC commitments.

a Waste trafficking

Waste exported illegally often ends up in illegal landfills, illegal storage sites, and other public ecosystems. Alternatively, it is burned in the open. Methane emissions from landfills have received the most attention in terms of waste and climate and are estimated to account for about 3% of the global GHG.⁵¹ Wastes imported illegally often do not follow safe waste management practices and often end up in illegal landfills or are burned openly, releasing black carbon and Persistent Organic Pollutants which are dangerous for public health. While open burning is less documented, the black carbon emissions generated from this practice are thousands of times greater than would otherwise be created by best practice waste disposal.⁵²

b Plastic waste trafficking

Global plastic production has quadrupled in the last thirty years and this trend is likely to continue.⁵³ In 2022, the global plastic recycling market was \$36.4 billion with projected growth to \$47.3 Billion by 2026.⁵⁴ As not all plastic waste can be recycled, ‘clean plastic waste’ needs to be sorted from the rest. Even clean plastic waste, however, is increasingly being restricted by importing countries where supply outmatches demand. According to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, recently strengthened by the 2019 Plastic Waste Amendments, plastic waste trading becomes illegal if it does not follow the convention protocols, particularly that both exporting and importing countries must consent to the exchange. This has led to the emergence of an illicit plastic waste economy, which includes fraudulently mixing clean with un-clean plastics or camouflaging its origin. Plastics are carbon intensive, consuming 6% of global oil production.⁵⁵ They can be carbon intensive to dispose of, particularly if they are burned in the open.⁵⁶ Plastic waste, particularly that which enters the oceans, also erodes marine ecosystems and has consequences for biodiversity.⁵⁷



c CFC/HFC trafficking

Chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCHCs) are synthetic gases that were primarily made for cooling and do not exist in nature. They have thousands of times more global warming potential than CO² and destroy the ozone layer.⁵⁸ Both gases were banned by the Montreal Protocol in 1989 due to their adverse impacts on the ozone layer.⁵⁹ This protocol was universally signed and succeeded in phasing out CFCs by 2010.

At that time, hydrofluorocarbons (HFCs) were proposed as a substitute as the absence of chlorine initially made HFCs less destructive to the ozone and they broke down more quickly.⁶⁰ However, HFCs are also a potent greenhouse gas, which is why they were also banned in the Kigali Protocol.⁶¹ These gases are difficult to dispose of, which makes confiscation and law enforcement more challenging.

Combatting waste trafficking and the resulting practices, such as open dumping and open burning, can contribute to the reduction of waste generation and promote sound waste management practices as part of the climate mitigation strategy and circular economy. It is an important element in enabling a circular economy transition and reducing the impact of the waste sector.⁶²



“Climate litigation is an important arena for various actors to confront and interact over how climate change should be governed.”

**“The difference today
is that the victims of
climate change are no
longer anonymous.”**



3 Climate change and criminal justice system response

Comparative advantages of the criminal justice system

International climate litigation has grown significantly as a means to advance climate action. The global number of climate related cases doubled between 2015 and 2021, as has the number of strategic cases aimed at catalysing broader behavioral and societal shifts. This includes litigation against public and private actors and other emitters for their failure to adopt sufficiently robust strategies to reduce emissions or abide by existing commitments.⁶³ The increase is due to growing public awareness of the environmental damage and impact of climate change, revision and strengthening of national legal frameworks, and improved scientific certainty as to the causes of climate change.

The vast majority of cases, as documented by the two main climate change litigation databases, are based in constitutional or administrative law, followed by human rights law and finally tort.⁶⁴ To date, there are almost no climate-related cases that use criminal law. The few that do use criminal law relate to climate change as a defence to activist action. In these cases, defendants have successfully used the ‘necessity to act’ to justify their actions.⁶⁵ It should also be noted that there are numerous climate litigation cases that successfully defend carbon emitters.

Classification of crimes and links with climate change poses another challenge. Many cases involving illegal deforestation or crimes affecting the marine environment will not reference climate change explicitly and are therefore not considered or ‘labelled’ as climate-related cases.⁶⁶ ‘Climate change litigation’ requires that a case explicitly raises issues of law or fact regarding climate change.⁶⁷ These conditions are often only satisfied if the plaintiff initiates the case with climate change as a central argument.





That stated, prosecutors interviewed for this paper indicate that climate change is increasingly being factored into their decision making, both in their prioritising of cases associated with climate change and by using the climate link as an aggravating factor in establishing culpability. Prosecutors also note that, even where civil litigation is pursued, it is important to keep the door open for criminal prosecution, both to preserve the option and improve the standards by which evidence is collected and preserved. This is particularly important to deter repeat offenders, including the private sector where environmental fines may be considered as part of the operational cost rather than an incentive to amend behavior. In such situations, criminal liability or the potential of criminal liability can have a greater dissuasive impact if it affects the interests of the individuals within corporations, rather than being a cost that is in the end passed on to the consumer.

The pursuit of civil litigation in the shadow of criminal law has been used in several notable cases to compel offenders to improve their behaviour or ensure compliance with compensation. In France, this technique was used against a corporation called the Casino Group which was found to have violated deforestation laws in Brazil and in Colombia as its suppliers had made payments to armed groups to acquire land for livestock.⁶⁸ In the case against Princess Cruise Lines brought by the Environmental Investigation Agency (EIA), the offender was required to take appropriate measures through its environmental compliance plan or face additional penalties which may include criminal liability.⁶⁹

Here, the concept of increasing penalties in response to repeated offending behaviour is important. This concept suggests that a first-time offender should be given a light sentence but that the penalty should be increased progressively if similar offending behaviour is repeated. This has been shown to be an effective tool in criminal justice.⁷⁰ In such a situation, a case can begin using civil litigation and move up to criminal sanctions. To facilitate this process, however, the requisite evidentiary threshold must be met.



“When it comes to the cost of doing business, prison is the one penalty that cannot be passed onto the consumer.”

4 Factoring in climate through the concept of harm and aggravating circumstances

Where criminal justice has a comparative advantage over civil litigation, there is a need to identify how criminal justice system actors - law enforcement, prosecutors, judiciary - can integrate climate into their considerations. Here, the concept of public harm is appropriate as it is frequently used in environmental law. The definition of what constitutes public harm is normative and varies but generally refers to the gravity of the offence in terms of its tangible adverse consequences.⁷¹ Provided there is sufficient evidence, the concept of harm to the public interest is an important consideration for prosecutors when making a decision to charge. Public harm is even more important for crimes that affect the environment as there is often less guidance as to whether an offence should be prosecuted using administrative, civil or criminal law.⁷²

While harm is determined by multiple factors, among the most prominent are the extent and permanence of the damage and whether the offender could have reasonably foreseen the harm. Climate change not only satisfies these elements but the gravity is heightened by the fact that its effects are often irreversible. Additionally, the gravity of the offence may be elevated due to the fact that climatic impacts strengthen with time, thereby disproportionately impacting future generations.⁷³ Scientific advances in determining the causes of climate change now make it possible to establish a causal link between two previously unrelated actions and, with it, legal liability. For example, a recent case in Germany established that the German electricity company, RWE, is liable for adaptation costs caused by glacial flooding in Peru because a court established that RWE contributed, even if by only a fraction, to climate change. If flooding eventually causes damage to villages downstream, higher claims or criminal proceedings against RWE may follow.⁷⁴

Determining these factors is similarly important to courts when assessing culpability as well as the corresponding punishment or remedy. In the event the offender is convicted, the judge or jury can also consider these circumstances as aggravating factors. The extent to which climate change can be considered an aggravating factor can be identified by considering several variables. These include the direct or indirect material loss of the damage, including remediation or compensation for the damage caused. The punishment or remedy can also consider matters of proportionality and whether or not the punishment is sufficiently dissuasive to deter similar offences.⁷⁵ This is particularly important if the offender has repeated the behaviour.

5 Assessing the impact of crimes that affect the environment on carbon emissions and ecosystems resilience

Establishing causal links between a potential crime and climate change is challenging, particularly where the consequence is not yet apparent.⁷⁶ Normally, in criminal law, causality is post-factum, where an act directly harms the environment or a victim. In the event where the consequences have yet to emerge and the victims are not even cognizant of the harm, the crime is often underestimated. This is particularly the case when the harm is diffused and transnational, affecting society at large.

To establish successfully the prospective harm caused by crimes that impact the climate, the use of scientific prediction-based causality is required. The transformation of scientific evidence into legal evidence through methods such as expert witnesses, court briefings or scientific studies can establish climate change-induced damage. The studies need to be provided to the court in a manner that is both easily understandable and convincing.

There are multiple ways to calculate the extent and scope of damage. This may require assessing the contribution of that crime to carbon emissions and the potential impact on ecosystem resiliency. Although impacts on the climate and, to a lesser extent, ecosystem resiliency are global in nature, the contribution of the crime to global emissions could be assessed by measuring its direct and indirect greenhouse gas emissions. Direct emissions are those emitted by sources owned and controlled by the perpetrator, such as by the fuel burnt in operating a chainsaw used in cutting a tree. Indirect emissions could be derived from the consequence of that activity, such as the decomposition of the tree and the loss of its potential carbon absorption.⁷⁷

To assess damage caused by direct and indirect emissions, the use of Global Warming Potential (GWP) is a common metric. GWP shows the global warming impacts of different gases by comparing it to the relative warming potential of 1 ton of CO₂. This calculation is a function of the capacity of the gas to absorb radiative energy and its longevity in the atmosphere. For instance, while both methane (CH₄) and CFCs are potent greenhouse gases, the latter has a much higher rating as it lingers for thousands of years in the atmosphere, whereas methane breaks down after a few years.

Measuring the impact of a particular crime on ecosystem health and resiliency is more complex. Ecosystem resilience is affected by numerous stressors. This tends to obfuscate causality as it is often difficult to distinguish the effect of one particular crime on that ecosystem. Although determining the extent of causality can be difficult and would need to be more qualitative in nature, the fact that the act contributes to the harm is relatively straightforward to establish. When assessing ecosystem resiliency through a climate lens, it would be necessary to highlight the deleterious impact on the capability of the ecosystem to continue providing the essential service, namely the sequestration of carbon.⁷⁸

| 20-year Global Warming Potential (IPCC 6th Assessment Report) | |
|--|------------------|
| CO ₂ (Carbon Dioxide) | 1 |
| CH ₄ (Methane) | 82 ⁸⁰ |
| N ₂ O (Nitrous Oxide) | 273 |
| Most common synthetic gases | |
| CFC-11 | 660 |
| CFC-12 | 10.200 |
| HCFC-22 | 1760 |
| HCFC-123 | 79 |
| HCFC-124 | 527 |
| HFCa | 1300 |

Although developing a model to measure damages is beyond the scope of the paper, one possible methodology could be to use cost-benefit integrated assessment models (IAMs).⁷⁹ This model is used frequently by the IPCC as it integrates numerous factors. One of the most important issues to determine cost is the time horizon. Usually with climate change, the longer the time horizon, the greater the cost. To illustrate the magnitude, it is estimated that each year of delayed mitigative action costs the global economy \$0.6 trillion, starting in 2020 and appreciating upwards every year thereafter.⁸⁰ The longer the mitigating action is delayed, the higher the cost. Even if it is determined that a particular actor contributes only a small fraction to the global damage, the costs in terms of damage are significant. This approach was used most recently in the German case against the utility company RWE, where the court determined it had contributed 0.47% to global carbon emissions.⁸¹ Even if the alleged carbon emitter only contributed 0.47% to global emissions, if the court determines that global damages are \$0.6 trillion a year, the potential damages are significant.

6 Challenges to enhancing the role of criminal justice

a The threshold between civil and criminal

There are advantages and disadvantages in choosing whether to proceed with civil or criminal proceedings. While civil litigation is often more efficient and less resource-intensive, criminal proceedings have higher standards and can have a greater deterrent effect, particularly on repeat offenders.⁸² Even where civil litigation is deemed more appropriate, keeping the backdoor open to criminal proceedings is good practice. This not only increases the deterrent signal, but the higher standards of evidence required for a criminal proceeding will make the civil case stronger.

b Corporate criminal liability

Preventing environmental crime, crime that is systematic and widespread, often requires investigations and prosecutions of corporations rather than individuals. The challenge with corporations is establishing the mental element of the crime, the *mens rea*. Two legal concepts - the 'identification doctrine' and 'respondeat superior' - are useful resources in meeting this challenge. The former identifies senior persons representing the company control as being the mind and will of that company and so bearing responsibility, whilst the latter insists that the corporation is vicariously liable for acts of its employees committed to benefit the company. Despite these conceptual resources, establishing corporate responsibility remains challenging.⁸³

c Lack of capacity and expertise

Prosecuting crimes that affect the environment associated with climate change is often procedurally and substantively complicated, and under-resourced. There are often weak penalties given the gravity of the offence.⁸⁴ Differences in jurisdiction can also complicate transnational crime, particularly where states do not have sufficient legal cooperation arrangements and there are national differences between national legislations as to what constitutes a crime. This relates to the limited methodology available to assess harm.

d Crimes that occur in parallel to legal activity

Sometimes referred to as 'Green Collar Crimes', these occur alongside otherwise legal business practices.⁸⁵ This occurs when criminal networks mask illicit activity by operating alongside or within legal businesses. These businesses can open and dissolve rapidly and supply routes changed in order to obfuscate criminal activity and liability. These hybrid enterprises demonstrate the adaptability of the criminal networks and their tendency to use innovative schemes to conceal their illicit operations.



“Climate change is also increasingly viewed as a driver of crime.”

7 Scanning the horizon

The effects of climate change are only just starting to be experienced and will continue to become stronger with time. Many of the impacts are already locked in, regardless of future carbon emission levels. These impacts will significantly impact both on the nature of crime and the ability to respond to that criminality. Given the need to be prepared, it is important continually to scan the horizons to identify the trends that will impact crime and criminal justice systems.

How will climate change affect and displace crimes?

Climate change is increasingly viewed as a threat multiplier threatening international security.⁸⁶ In a similar manner, climate change is also increasingly viewed as a driver of crime.⁸⁷ This is due to factors including the adverse impacts of climate on social control, and its potential to foment conflict and to create opportunities for crime.⁸⁸ Quantitative models suggest a relationship of mutual causality with climate change creating the conditions for more crime and crime degrading the capacities to withstand climate impacts.⁸⁹ Some models even attest that they can identify how many additional law enforcement resources are needed for each degree of global temperature rise.⁹⁰

Climate change is also likely to increase certain types of crime and displace others. For example, crimes associated with migration, including migrant smuggling, are likely to increase as migratory pressure increases. Other types of crime, including those associated with shipping routes, will change as new routes open after the ice sheets melt. Changes in migratory fish patterns and diminishing fish stocks may also increase tension and conflicts over their exploitation.

The global response to adapt to and mitigate climate change is also creating new types of criminality. These new crimes include carbon credit fraud, illegal solar panel and battery waste trafficking, illegal cobalt and lithium mining and other crimes. Pollutants related to prospective geoengineering efforts have also been raised as an issue that may need to be explored.⁹¹

What behaviour is likely to be criminalised in the future?

As the impacts of climate change increase, so too will public pressure to respond more effectively. This will likely have an impact on what behaviour is considered by society to be acceptable. As a result, it is probable that some behaviour that is currently legal will be unlawful in the future or that penalties will increase. This change in norms may impact fishing practices, oil exploration including flaring, and waste production and management.

What should the criminal justice system prepare for climate impacts?

Increasing crime rates, coupled with changes in the type of criminality as well as the physical impacts of climate change on the criminal justice system, will create new challenges that require an adequate response. These include enhancing awareness of the impacts of climate change and how crime aggravates its impacts. It also requires improving the climate resiliency of the physical infrastructure of the justice system. Although increasing capacity, including through investment in justice system infrastructure, is a costly endeavour, the overall cost is less if it is implemented in a preventative manner. It may also provide an opportunity to improve energy efficiency, thereby mitigating cost over time.

The merging pathways of climate change and crime



Conclusions and recommendations

1 Encourage the recognition of the relationship between crime and climate change by integrating crime that affects the environment into the agenda on biodiversity loss and climate change. This requires raising awareness among stakeholders by expanding and elevating the dialogue including discussions, awareness-raising events at the UNFCCC climate conferences, multilateral environmental agreements fora, the UN general assembly and dedicated crime fora. Further, IPCC Working Group II with Climate Change Impacts, Adaptation and Vulnerability could consider the potential of climate change to influence patterns of crime, and the role of environmental crime in increasing the vulnerability of natural ecosystems and their capacity to mitigate climate change. Another opportunity is to integrate crime as a factor in the IPCC Shared Socioeconomic Pathways (SSPs).

2 Support efforts to prevent, investigate, prosecute and adjudicate crimes affecting the environment and associated organized crime. By investing in efforts to prevent, investigate, prosecute and adjudicate crimes affecting the environment as part of the ecosystem-based climate mitigation, biodiversity loss and waste management agendas, illegal activities affecting people and nature will be reduced and ecosystem resilience strengthened.

3 Integrate climate change considerations into criminal justice decision making processes, including through the use of public harm. Develop standardized methodologies to evaluate climate harm for prosecutors and the courts, including science-based predictive analytics. Standardize briefings to prosecutors and court briefings, and sentencing guidelines on climate to harmonize penalties. This may also include reviewing the penalties associated with these types of crimes and offences to make them more proportional with the actual harm, including the generational impact, and the need to make the punishment sufficiently dissuasive to have a deterrent effect.

4 Support interdisciplinary approaches and dialogues and the development of new detection capacities. More dialogue and cross-pollination between criminal justice actors and climate/environmental experts is needed. This includes collaboration to develop a methodology to create legally admissible evidence of the harm caused by climate change using predictive analytics. It also includes investing in new technology to detect pollutants and other crimes that affect the environment, and ensuring that these technologies produce evidence that is admissible in court.

5 Support the justice system to prepare for the impacts of climate change, both in terms of the direct impact on infrastructure and the impact on criminal behaviour as new crimes emerge. As with all public services, the justice system needs to invest in making its infrastructure more resilient to climate impacts. This investment is more cost effective if implemented in a preventative manner. The justice system also needs to anticipate how climate change will impact criminality. Responding to these impacts will likely require expanding criminal sanctions on crimes associated with climate change as well as other practical measures such as enhancing judicial cooperation.

6 Continually modify legislation and regulations to prevent climate related crime more effectively. Establish regional and national fora to review legislation and share best practices, including on the consideration of climate change as a harm and an aggravating factor. This should include in particular how better to address the issue of corporate liability. Given the resultant increase in case load, national authorities will need to increase the requisite financial and human resources.

7 Quantify the contribution of crime to climate change, both in its contribution to emissions and to lowering ecosystems resilience. In order to appreciate the scope of the impact crime is having on the climate and to assist the justice system in quantifying harm caused by these impacts, a methodology needs to be developed. This methodology needs to serve the interests and capabilities of both the justice system and those working in the climate space.

8 Encourage the recognition of cross-cutting issues, such as the impact on the poor, future generations, indigenous communities and issues of gender, when considering amendments to legislation and regulations combating climate-related crimes. Recognising the relationship between crimes that affect the environment and broader local, regional and national socio-economic structures will allow for more sustainable and effective responses that do not risk further inequalities.

List of persons and organizations consulted

Name

Organization

| | |
|--------------------------------|---|
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| Batros, Ben | Center for Climate Crime Analysis |
| Bueger, Christian | University of Copenhagen |
| Clarke, Nancy | Department for Environment, UK Government |
| Desmond, Jenny | Liberia Chimpanzee Rescue & Protection |
| Duffy, Rosaleen | University of Sheffield |
| Ferrer, Montse | Amnesty International |
| Folly, Maiara | Plataforma CIPÓ |
| Fournel, Henri | Interpol |
| Gallmetzer, Reinhold | Center for Climate Crime Analysis |
| Garg, Anusree | Office of Conservation and Water, U.S. State Dept |
| Germand, Basil | University of Lancaster |
| Glaser, Sarah | World Wildlife Fund |
| Haag, Frederik | International Maritime Organisation |
| Jesus, Jorge | Europol |
| Khaled, Fathi | Y30 |
| Korthals, Claudia | Department of Justice, EU Commission |
| Lagier, Frank | French Magistrate |
| Lijn, Jaïr van der | Stockholm International Peace Research Institute |
| Manguiat, Maria Socorro | United Nations Environment Programme |
| Marechal, Louis | Organisation for Economic Co-operation and Development |
| Mofizur, Mohammed | Potsdam Institute for Climate |
| Morgado, Renato | Transparency International |
| Mura, Marco | Parliamentary Assembly of the Mediterranean |
| Pavarini, Francesca | DG NEAR, European Commission |
| Piagionne, Rocky | Environmental Crimes Section, US Department of Justice |
| Popova, Svetlana | Interpol |
| Poux, Joseph | Environmental Crimes Section, U.S. Department of Justice/ Interpol |
| Pörtner, Hans-Otto, | Pollution Crime Working Group |
| Robinson, Darryl | Intergovernmental Panel on Climate Change, Working Group II |
| Rousseau, Laura | Queens University |
| Smirnova, Jelena | Sherpa |
| Stamatios, Christopoulos | Eurojust |
| Santagostino, France Alejandra | One World Natural Security and United Nations Development Programme |
| Tasse, Julie | International Development Law Organization |
| Uppelschoten, Annette | Institut de Relations Internationales et Stratégiques |
| Waisbich, Laura Trajber | Frontex |
| White, Rob | Igarape Institute |
| Wyatt, Tanya | University of Tasmania |
| | Northumbria University |

UNODC wishes to acknowledge the contributions of UNODC staff members, Olga Kuzmianok and Niels Peters Williams as well as WWF staff member, Sarah Glaser who were responsible for the development of the paper. The paper benefited from the valuable input of many UNODC and WWF staff members and consultants who reviewed various sections of this report including: Jorge Rios, Shamini Jayanathan, Giovanni Broussard, Riikka Puttonen, Steven Broad, Angela Me, Giuseppe Sernia, Elisabeth Seidl, Iona Cotutiu, Jenna Dawson-Faber, Kimberly Sayers Fay, Lena Ngnogue, Maud Sarlieve, Pooja Bissoonauthsing.

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