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Environmental crime and the harm prevention criminalist

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The role of the 'pracademic' comes in the fore in the interface between academia and environmental protection. This article explores the translation of evidence-based research and theoretical innovation in environmental crime prevention into ground level practice. Crime prevention as applied to illegal fishing forms the initial focus of the discussions. This is followed by discussion of pracademics and the importance of combining academic work and practitioner experience as part of applied criminology. The paper then discusses the potential role of a 'harm prevention criminalist' in crime prevention interventions. As something potentially at the frontier of future work, this position involves a combination of skills including site and crime assessment, interpersonal communication, collaborative engagement, and horizon scanning.

KEYWORDS

collaboration, criminalist, crime prevention, environmental harm, horizon scanning, Illegal fishing, pracademic

Introduction

Jobs for the future need to be created in the present. Environmental degradation, threats to biodiversity, and climate change are the most important systemic issues facing humanity. How we respond to these challenges is not only a matter of strategic planning and marshalling of resources, but workforce development. Addressing environmental crime requires agencies equipped with appropriate professional human resource capabilities, both in responding to crime and preventing it.

This article explores links between academic research in environmental crime prevention and ground level practice. Crime prevention as applied to illegal fishing forms the initial focus of the discussions. As part of this, the article discusses the knowledge and reception of academic literature on crime prevention in a government authority tasked with stopping illegal fishing, a task made particularly complex given that it occurs in a community that is highly culturally and linguistically diverse. Attention

then turns to the role of a 'harm prevention criminalist' in crime prevention interventions. Being at the frontier of future work, this potential position involves a combination of skills including site and crime assessment, interpersonal communication, collaborative engagement, and horizon scanning.

The article speaks to the necessity for both theoretical and applied criminology and acknowledges the role of pracademics in trying to 'make a difference' with respect to real world policies, programs, projects, and politics. The main orientation of the discussion is toward the future – both in terms of general environmental developments and a potential role for criminologists as practitioners in responding to environmental calamity.

The practice of prevention: Illegal fishing

Environmental crime prevention as a specific type of crime prevention encompasses a range of considerations. Different kinds of harm require different kinds of responses. There is now an extensive body of work that deals with preventing environmental crime in different geographical locations, in relation to different types of commodities and crimes, and utilising many different techniques and approaches (see for examples, Pires and Moreto, 2011; Lemieux, 2014; Sollund et al., 2016; van Uhm, 2016; Cao, 2017; Moreto, 2018; Sollund, 2019; Wong, 2019; Wyatt, 2022). As these studies indicate, general pronouncements about the nature of harm need to be accompanied by analyses of specific sites and crimes. This applies to illegal fishing as it does to other types of environmental crimes and harms.

There are, for instance, major variations in illegal fishing as this pertains to criminal activity and this in turn is shaped by context and purpose, such as fishing for subsistence versus money-making (White, 2008). Studies of specific types of illegal fishing (e.g., abalone, crab, lobster and toothfish) show marked differences in motives, techniques, local cultures, and scale of operation (McMullan and Perrier, 2002; Tailby and Gant, 2002; Smith and Anderson, 2004; Anderson and McCusker, 2005; de Coning and Witbooi, 2015; Petrossian et al., 2015; Petrossian et al., 2016). Within specific fishing sectors, there may also be great variation. For example, abalone theft includes organised poachers, licensed divers, shore-based divers, extended family groups, and individuals, all of whom differ in methods, motivation and use of the abalone catch (Tailby and Gant, 2002). Moreover, different actors may be involved at different points – harvesting, processing, transporting, retailing, consuming – requiring different skills, such as diving, canning, driving, selling, and cooking.

Environmental crime prevention, therefore, needs to be tailored to fit circumstance.

Models and techniques of prevention

Accordingly, a range of crime prevention approaches have been developed in relation to illegal fishing – that incorporate social developmental and community measures as well as those that are situational and techniques oriented (Sutton et al., 2021). Recent methods and techniques of environmental crime prevention, specifically as applied to illegal fishing, include:

- application of *Situational Crime Prevention* that features increasing the effort of crime through target hardening, increasing the risks through enhanced satellite surveillance, reducing rewards by disrupting markets, reducing provocations by neutralising peer pressure that sustains a culture of offending, and removing excuses by measures such as posting instructions about compliance and enforcement regimes (Kurland et al., 2017).
- employment of the *CRAVED Theft Model*, which refers to Concealable [size, overall catch load]; Removable [easy to catch]; Abundant/Accessible/Available [hot spots]; Valuable [larger, scarce]; Enjoyable [found in recipes]; and Disposable [highly commercial] (Petrossian and Clarke, 2014). Using this model, investigators can provide analyses applied to multiple illegally-caught species, make comparison across species and locations; focus on methods, perpetrators, consumers; and be informed by the notion of 'suitable targets of crime'.
- a *Crime Script Analysis* considers the variety of motives, different sets of skills and knowledge, and different modus operandi involved in criminality (Sahramaki and Kankaanranta, 2017; Petrossian and Pezzella, 2018; Dehghannirir and Borrion, 2021). Crime is a process, and the actual criminal event is only one of the 'events' in this process. Accordingly, the task is to lay out a 'script' and carefully scrutinise the sequential steps. This leads to policy and programmatic responses built upon the knowledge provided by script analyses. A crime prevention response is based upon 'reading' the script based upon the responses and information provided in investigation.
- a *Market Reduction Approach*, as applied to the illicit endangered species trade, seeks to identify the routine patterns of those involved, such as poachers, handlers, and consumers (Schneider, 2012) and is also relevant to investigation of illegal fishing. Issues of seasonality, how harvested, demand, and processing are all included in such analyses. As applied to fishing, key agencies include fisheries, customs, marine park authorities, port authorities and the navy; key stakeholders include commercial and recreational fishers, tourism operators, local residents and biologists.

- a fisheries *Value-Chain Model* refers to an abstract rendition of typical progressions based on experience and prior examinations of an industry (UNODC, 2019a). For instance, the fisheries 'process value chain' occurs on shore and at sea, and involves standard stages including preparation, fishing, landing, processing, sales, transport, and the consumer. Each of these stages simultaneously reflects various social control processes – for example, during 'preparations' matters might include licenses, quotas, crew, captain and vessel registration, while 'sales' involves things such as invoice, accounting, product yields, bank transactions, correspondence, and contracts. This is not a crime script as such, but it does provide crime prevention practitioners with a sense of 'where to look' and 'who to watch' as part of the fisheries value chain model.
- *Trade-related measures* involve schemes that require documentation to accompany the product to authenticate its legitimacy (Lack, 2007). In regards illegal fishing, vessel lists can be drawn up and used to identify authorised vessels ('white lists') and vessels considered to be fishing in breach of the law ('black lists'). The lists are then used to restrict the access of black listed vessels to ports and port services. Such lists may also involve trade bans on specific States that are considered to have failed to co-operate in the implementation of regional conservation and management measures.
- *Community Crime Prevention* measures include working at the local level to address issues (Moreto, 2018). These issues include the ambiguities surrounding fishing, given that it is legal and it is only certain regulations that make it illegal, and where local cultures view it as a 'folk crime' and not really that serious (McMullan and Perrier, 2002). Prevention involves encouraging citizen engagement as guardians of nature and having local tourism and other commercial interests as natural resource managers (through initiatives such as 'Fish Watch' and confidential phone-in hot lines) and use of relevant technology (GPS-linked photos; fish identification). Coastal watch schemes and monitoring programs, as well as Indi
  genous coastal patrols, are also community-based measures.
- *Focusing on high-risk locations* is common to crime prevention approaches generally and this has also been applied to identification of the places where illegal fishing occurs (Weekers and Zahnow, 2018). For example, detailed analyses show a distinctive spatial distribution of poaching events within the no-take Marine National Parks of the Great Barrier Reef Marine Park. Based on these findings, that demonstrate most crimes of a particular type occur in a small number of 'risky' places, tailored crime prevention measures can be applied, such as random patrolling, deployment of surveillance cameras, and GPS tracking of boats from nearby launch sites, in these high-risk areas.

As with other types of environmental crime, illegal fishing may stem from the exclusion of small-scale fishers from traditional fishing spots or species, and reflect historical inequalities and colonial experiences (Hubschle et al., 2021). A holistic approach to crime prevention acknowledges that diverse interests need to be accommodated as part of the crime prevention problem-solving process (Sutton et al., 2021) and that environmental restorative justice should likewise be considered part of the crime prevention toolkit (Pali et al., 2022). As applied here, such an approach attempts to foster community-level compliance and engagement in guardianship, the tackling of economic and cultural factors that legitimate illegal fishing, uses the full suite of techniques and technologies to monitor and address issues, and situates fish (and the protection of fish) within the context of both ecological and social environments.

Smaller scale interventions and prevention

While sophisticated methods and models of environmental crime intervention have been developed by criminologists, policymakers and practitioners operating at high levels of office, at the ground level the situation is somewhat different. Here work tends to be much more constrained by circumstance and limited resources.

For example, the main orientation of fisheries officers in the State of Victoria in Australia is on 'catching the bad guys' rather than prevention as such. It is notable, therefore, that Fisheries Victoria recently organised one of its first ever conferences and related activities on crime prevention (2020-2021). The chief organiser wanted to impress upon her colleagues the importance of crime prevention (rather than focussing solely on reactive investigation and prosecution). She, too, had to learn much 'from scratch' as crime prevention had not been part of either her training or her day-to-day job mandate.

Several criminologists, including myself, were invited to present overarching explanatory papers at the conference. Much of the work of Fisheries Victoria relates to freshwater fishing and breaches of fisheries law. Two things immediate stood out for me as a conference participant. First, it was basically just the one person driving the 'crime prevention'

agenda (most of the regulatory activity is reactive not proactive), and she was trying to organise training and materials without any previous exposure to criminology or crime prevention literature. Second, a vital issue in the State of Victoria is 'community crime prevention' insofar as the culturally and linguistically diverse population means that there are challenges in regards communication, expectations, relationships to 'authority', and notions/knowledge of acceptable behaviour. Practitioners were thus simultaneously endeavoring to learn the essential concepts and models of crime prevention, how best to achieve behaviour change and prevent crime, and how to strengthen community engagement to make prevention programs stronger.

The challenge for practitioners was to learn more about prevention techniques that resonated with their own jobs and experiences, as well as social crime prevention approaches to address the diversity of the regulated communities. The challenge for academics was to move from abstract models to try to pinpoint specific tactics and techniques that would be seen as useable by practitioners, relevant to policymakers, and affordable from the viewpoint of those controlling the agency purse strings. On either side, the problem of language is formidable – since specific terms frequently mean quite different things to different people (see Pink, 2021 on diverse uses of terminology in regulation and law enforcement), and there are varying degrees of understanding across the technical, experiential, applied and intellectual domains. Practitioners in Fisheries Victoria and agencies such as the Environmental Protection Agency, for example, come from a variety of backgrounds – including marine science, ichthyology, economics, chemistry, and law enforcement – and this is partly reflected in the variable ways in which they apply their specific knowledge and skills in undertaking regulatory work. Not everyone is on the same page when it comes to mission and role.

As a result of this engagement with Fisheries Victoria, my attention turned toward initiatives that could help to translate academic knowledge into grounded practice. Part of this involved interrogating the nature and role of 'pracademics' in environmental crime prevention. This was grounded in experiences such as the previously mentioned conference and has led to further consideration of the potential role of criminologists in working with people at the coalface. The emergence of new types of harms, such as those pertaining to global warming, also propelled interest in how changing 'harmscapes' (Mutongwizo et al., 2021) are rapidly shifting the terrain of both conceptions of harm and practitioner responses. For example, these profound changes have huge implications for aquatic and marine life (e.g., migration of fish species in the oceans, the impact of drought and algae blooms on fish populations in freshwater systems). For environmental crime generally, it points to larger issues of perspective and approach that need further unpacking.

Pracademics and applied criminology

The term 'pracademic' is based on the words, 'practitioner' and 'academic'. It alludes to persons who strive to combine elements of applied, practical knowledge with the insights of abstract research and/or scholarly knowledge.

Practitioners tend to be focussed on the tasks at hand, drawing upon experience, expertise, and technical skills to address matters such as, for example, crime scene examination, criminal investigation, legal advocacy and DNA analysis. There is a defined project, defined goal and defined outcome, whether this relates to scientific analysis, police work, regulatory compliance, or court adjudication. Academics carry out studies and evaluations of policy and practice, and impacts and risks, and less frequently engage directly in practical interventions. Some concentrate on consolidating knowledge in the form of developing theories and concepts, categorising previous research into conceptual models, and summarising existing findings and/or writing histories of knowledge (White, 2023).

The role of the pracademic comes to the fore in the interface between academia and environmental protection. It finds its best purchase when evidence-based research and theoretical innovation in environmental crime prevention is translated into ground level regulatory and law enforcement practice. This sort of 'applied criminology' involves academic and practitioner attempts to concretely address environmental crimes and harms. That is, the emphasis is on action and intervention. Rather than simply or solely studying an environmental issue or problem (e.g., the causes of climate change, the impact of city air pollution on children), the point of applied criminology is to prevent, stop and/or deter perpetrators as well as support environmental victims (however defined). It is about (in)justice in the here and now, occurring in specific places, and involving specific actors, situations, commodities, and institutions. Academic interest lies in how the stakeholders and institutions of criminal justice perform their roles and how they might improve their strategic, operational, and tactical capacities, based on comparative research, practice evaluations, improvements in technology and conceptual innovation.

Addressing environmental crime requires official state agencies that are equipped with appropriate professional human resource capabilities, in at least two areas. First, in the global setting there is presently a lack of consistency in approach to training environmental officers. This applies to services that include 'green police' through to environmental regulators

whose task is to monitor compliance and enforce laws in areas such as national parks, wildlife protection and pollution control. International organisations such as the International Network for Environmental Compliance (INECE), INTERPOL and the United Nations Office on Drugs and Crime, and their counterpart domestic organisations such as the Australasian Environmental law and Regulators Network (AELERT) provide increasing support for improved training and capacity-building measures. In regards environmental crime, for example, the UNODC has recently produced guides on drafting legislation to combat wildlife crime and addressing corruption in the fisheries sector (UNODC, 2019a; UNODC, 2019b). As part of its 'Global Programme for Combatting Wildlife and Forest Crime', the UNODC is working to enhance capacity-building and wildlife law enforcement networks. Its work also includes the delivery of specific technical assistance activities, such as coordinating the implementation of the *Wildlife and Forest Crime Analytic Toolkit* (UNODC, 2012).

As part of these developments, there is a need to develop further a professionalised workforce with an appropriate and recognised career structure. Academics can play an important part in professional training and education by conveying knowledge and skills in a structured work-relevant manner. For instance, the 'Education for Justice'[E4J] initiative seeks to prevent crime and promote a culture of lawfulness through education activities designed for primary, secondary, and tertiary levels. The intention is that these activities will help educators teach the next generation to better understand and address problems, including actively engaging in their communities and future professions to do so. The UNODC has coordinated the preparation of E4J tertiary level materials, consisting of peer-reviewed university modules. In the specific area of environmental crime, the tertiary modules include modules on *wildlife, fisheries, and forestry crime*. Module 5: Sustainable livelihoods and community engagement (/34j/en/wildlife-crime/module5/index.html) provides an exemplary model of community crime prevention as applied to wildlife crime including illegal fishing. These resources are 'open access' and thus not subject to copyright restrictions.

Second, there is the need for a new type of professional whose specific function is to provide improved assessments of environmental harm and collaborative methods of responding to them. Such a position would be at the fulcrum of diverse disciplines (for example, toxicology, marine science, biology, law) and provide the organisational lever for the establishment of multi-agency task forces. What is needed is a working model of collaborative practice that from the very beginning is organised around specific purpose and intended outcomes, that would include investigation across the retrospective (past harms) and prospective (future harms) continuum, inclusive of different levels of scale (local, national, regional, transnational, global), with a view to enhancing strategies for crime prevention, environmental regulation, law enforcement, emergency services planning, and crisis response.

The use of multidisciplinary teams ensures deployment of skills that combine scientific and technical expertise, crime scene expertise, and expertise in detection of illegality and criminality. Likewise, the institutional culture surrounding regulation, compliance and enforcement activities has a great bearing on how work to monitor, investigate, prevent and prosecute environmental crime is carried out in practice. The push for professionalisation of environmental intervention is a move which would help institutionalise a consistent approach to the prevention and policing of environmental crime.

Clearly defined areas of expertise, supported by ongoing training and education, can instil a strong sense of mission and independent critical thinking. An example of this is the FloraGuard project in the United Kingdom. This project set out to develop a methodological approach that combines the efficiency of Artificial Intelligence [AI] search algorithms with a suitable level of human analysis (Whitehead et al., 2021). To tackle the problem of online trading in illegally sourced wildlife, several disciplines needed to be involved to combine expertise in the fields of conservation science, criminology, law enforcement, and information and communications technology (ICT). This, in turn, required the creation of a novel socio-technical workflow, one that involved the different disciplines at different stages or steps in the investigation of Internet-facilitated illegal wildlife trade. For example, at Step 1 the concern is to identify species of interest. This involved conservation scientists and law enforcement officers. Step 2 is concerned with developing a lexicon suitable for the website search. This step involved the conservation scientists, law enforcement officers, ICT scientists and criminologists. Each step therefore involved diverse participants depending upon the expertise required and the insights needed.

Importantly, this methodological approach required an intensely multidisciplinary approach that approached the transdisciplinary. While each discipline performed specialist tasks, a cross-disciplinary exchange of information was frequently essential for the successful execution of those tasks. Knowledge transfer occurred not only between disciplines at the designated stages of the workflow (for example, Step 1) but also more organically, as key inputs and outputs were produced. As the project developed, therefore, knowledge sharing led to deeper understanding across the team. Not only was the workflow planning itself novel (and, effectively, multidisciplinary), but the process likewise led to a greater sense of interdisciplinary participation and experience.

Projects such as FloraGuard provide working tools whereby forensic computing can be mobilised to assist conservation

practitioners and law enforcement agencies in detecting poachers online with the potential of disrupting their means of profiting from illegally sourced specimens. Diverse skills and knowledge are required for this to happen, including the use of algorithms to direct searches for online posts, plant identification, knowledge of trade names of the plants being bought and sold (rather than formal scientific descriptors) of sought-after plant species, and behavioural analysis associated with online activity including evidence of illegal trade.

Environmental harm prevention

Fundamentally, discussion of pracademics and applied green criminology point in the direction of 'praxis' – the synthesis of theory, research, and intervention. Praxis is the unity of 'theory' and 'practice' in motion at the ground level of action. We learn by 'doing'; we learn by 'reflecting'. How we act in preventing and responding to environmental crimes and harms depends on the sophistication of our understanding of the issues. It also depends on the skilfulness of our interventions in communities and across diverse social contexts. For pracademics the importance of praxis is that it bridges artificial divisions between academic study and grounded practice.

We stand at a pivotal point in human history, one that is witnessing systematic destruction of the basic environmental contours of our planet. The three greatest threats to humankind and myriad other species, ecosystems and the Earth generally are climate change, rapidly diminishing biodiversity, and pollution and contamination of land, air and water. Social intervention to counter these trends, and the implementation of suitable mitigation and adaptation strategies, is urgently needed. The field of criminology and its associated disciplines such as law, sociology, psychology, political science, international relations, and economics should and must play a part in the needed institutional shake-up and system transformation. This requires concerted activity around environmental issues. It also demands creative thinking and innovative ways in which to construct professional roles.

For instance, we can start by analysing *environmental harm* as a crime scene. Some preliminary work along these lines has already begun (Lam and Tegelberg, 2021). This kind of re-imagining also suggests a new type of investigator: the harm prevention criminalist. This position could have wide and diverse applications including contributions to effective disaster relief, policing, emergency service provision, and more. There is urgent need to develop an integrated approach to environmental harms. Creating this new occupational category, informed by criminological theory and practice, is a means by which to do this. The vision is of improved assessments of environmental harm, and collaborative methods of response. Courts, police, and environmental protection agencies are crucial actors here, as are the emerging environmental enforcement networks (Pink and Lehane, 2012; Pink and White, 2016) – along with scientific experts, non-government organisations, and citizen scientists.

Matters pertaining to social and environmental justice in the context of present institutional arrangements are also of concern. For instance, the environmental justice framework seeks to prevent environmental threats and is premised upon a series of interlinked propositions and principles (Bullard, 2005). These principles emphasise values such as social equity (in which all individuals should have a right to be protected from environmental degradation) and harm prevention (that focuses on eliminating a threat before harm occurs). Each of these areas requires that considerable resources be devoted to measuring things such as human exposure to environmental chemicals, and sociological analysis of harm and risk distributions among diverse population groups.

An important part of the environmental justice framework is ideological and practical support for the adoption of the precautionary principle. From a social movement perspective, the preferred emphasis when it comes to precaution is to err on the side of human safety and wellbeing, rather than industrial development. As Bullard, (2005: 28) observes:

> It asks "How little harm is possible?" rather than "How much harm is allowable?" This principle demands that decision makers set goals for safe environments and examine all available alternatives for achieving the goals, and it places the burden of proof of safety on those who propose to use inherently dangerous and risky technologies.

Moreover, the environmental justice framework requires that: '[those] parties applying for operating permits for landfills, incinerators, smelters, refineries, chemical plants, and similar operations must prove that their operations are not harmful to human health, will not disproportionately affect racial and ethnic minorities and other protected groups, and are nondiscriminatory' Bullard (2005: 28–9).

Taking precaution is not only about risk assessment. It is about marshalling requisite expertise in order to best understand the specific problem at hand. Science can and must be a major tool in deliberations over human interventions and human impacts. But this is only one sort of knowledge. Expertise is also developed from the ground up, not simply on the basis of experiment and scientific method. Farmers on the land, and fishers of the sea, for example, have generations of expertise built up over time and under varying environmental conditions. Indigenous peoples frequently have knowledge and understandings of their environments that go back to time immemorial. The fact that some Indigenous people have survived for thousands of years, and thrived, in extremely

hostile environments (the frozen lands of the north, the deserts of the dry continents) is testimony to human practices that are positively connected to immediate environs (Robyn, 2002). Discussions of conservation and wildlife protection in Africa highlight the fundamental importance of local communities as 'fulcrum institutions' which, accordingly, means they ought to occupy centre stage in such efforts (Hubschle and Shearing, 2018). A public participatory process of deliberation needs to incorporate all these kinds of voices. It also needs to be able to challenge the 'wisdom' and 'truth' of each, without prejudice and without fear.

The harm prevention criminalist

Today, a major consideration is how to translate future projections, particularly around climate change, into the realm of applied criminology. This is precisely the intent behind the creation of the *harm prevention criminalist* position, which would formally bridge the gap between disciplines and thus constitute a practical demonstration of how cross-disciplinary, multi-disciplinary and transdisciplinary research and practice can be institutionalised (in this instance around the frame of 'environmental harm'). This is not simply about sciences and disciplines 'talking with each other'. It presents a working model of collaborative practice that from the very beginning is organised around specific purpose and intended outcomes, incorporating community collaborations and co-design as part of its mandate.

The accompanying figure (Figure 1) provides a schematic portrayal of the key dimensions of the proposed harm prevention criminalist.

The specific skills and intellectual input associated with forensic science/studies, environmental/social impact assessment, and crime prevention are unique insofar these are quite specific areas of endeavour (see for example, Burdge, 2004; Elliot, 2014; Taylor et al., 2004; Peel, 2005; Morrison-Saunders, 2018; Julian et al., 2022). The harm prevention criminalist would need to tap into each of these areas and apply relevant concepts, techniques, technologies, and methods to specific types of environmental harm, such as for example, legacy mining, eco-damage stemming from salmon farms, plastic in oceans, water theft, and bush fires (exploring each of these in terms of past, present, and future harms). These examples of environmental harm have temporal and geographical dimensions, with diverse consequences and impacts on industries, human and non-human species and environments depending on extreme weather events, the cumulative build-up of risk, efficacy of regulatory systems, and shifts in overarching climate conditions.

Applied investigation is needed across the retrospective (past harms) and prospective (future harms) continuum, inclusive of different levels of scale (local, national, regional, transnational, global), with a view to enhancing strategies for crime prevention, environmental regulation, law enforcement, emergency services planning, and crisis response. Tasks of the harm prevention criminalist include skills and knowledge audits in support of forming relevant task forces; incorporation of eco-justice considerations in analyses of harm (humans, ecosystems and non-human entities as subjected to harms); modelling collaboration (vertical, horizontal, diagonal) suited to the issue at hand; comparative analyses (over time, and with respect to different places); and horizon scanning oriented toward identification of trends and issues into the future (and applications of the precautionary principle). Issues of intelligence gathering and forward planning are essential to the tasks and duties of the harm prevention criminalist, as are the soft skills of interpersonal communication.

The necessity for a harm prevention criminalist is demonstrated in discussions surrounding the environment and security. Hall (2013: 36) observes that definitions of 'environmental security' differ, but generally the concept tends to link environmental degradation and associated scarcity of resources with human conflict at individual, group, and state levels. Scarcity is tied to the over-exploitation of natural resources. It is also increasingly linked to the consequences of global warming (IPCC, 2014; White, 2018; IPCC, 2022). Environmental harm is a contributor to and outcome of human insecurities. Illegal and over-fishing, side-stepping of hazardous waste disposal regulations, water and land theft, rorting of alternative energy subsidies and policies, and transference of toxicity and contaminated products across national borders are driven by different motivations and involve a wide range of actors. Yet, the consequence of such activities contributes to even more ruthless exploitation of rapidly vanishing natural resources, as well as the further diminishment of air, soil and water quality, thereby exacerbating the competition by individuals, groups and nations for what is left.

Old crimes are presenting in new contexts (e.g., water theft), and new crimes are emerging out of changing circumstances (e.g., carbon emissions fraud). Crime prevention strategies and rapid response efforts are needed for both kinds of crime.

This occupational proposal is fundamentally about prediction and prevention, and therefore must include a typology of environmental harms that reference diverse situations, settings, offenders, and offences. For example, consideration has to be given to crimes such as water theft for family farm use related to basic survival (caused by lack of rain and changes in temperatures), through to new opportunities for organised crime networks to be involved in activities such as illegal trade in water. A vital component is an orientation toward building social resilience within and among communities, and as part of this enhancing the capabilities of specific institutions and agencies in dealing with the foreseeable and unanticipated

DIMENTIONS OF THE ENVIRONMENTAL HARM CRIMINALIST

Significant Past and Present Environmental Harms

Future Harms Climate Change

Focus

Air, Land, Water, Energy

Scale

Local, National, Regional, Transnational, Global

HARM PREVENTION CRIMINALIST

Task forces [skills and knowledge audit]
Justice orientation [humans, ecosystems, species]
Collaborations [vertical, horizontal, diagonal]
Comparative [over time, with respect to different places]
Horizon scanning [trends, issues, precautionary principle]

RETROSPECTIVE INVESTIGATION ---------- **PROSPECTIVE INVESTIGATION**

Forensic sciences
Forensic studies

Environmental impact assessment
Social impact assessment

Concepts
Techniques
Skills Sets
Technologies
Personnel
Intelligence

Examples of Environmental Harms

Toxic Towns
legacy waste
floods

Water Theft
farming
potable water

Plastic in Oceans
fishing, tourism, recreation

Bush Fires
residential, forestry, tourism

Salmon Farms
eco-health, competing industries, regulation

Regulation – Prevention – Enforcement – Emergency Services

FIGURE 1
Dimentions of the environmental harm criminalist.

consequences of environmental harms and climate change. This parallels similar arguments with respect to the notion of 'resilience policing', which envisages a role for police in enabling communities and other actors to develop strategies for adapting and surviving broader societal shocks and harms (Mutongwizo et al., 2021).

Diverse skills, knowledge and collaborations are required in each instance of environmental harm, and it is the bringing together of these that forms the basis of the harm prevention criminalist role. This role is not conceived as 'project management'; rather, the intention is that it be a mid-range position within a strategic hierarchy of intervention as this pertains to specific kinds of environmental harms. Thus, for example, the key administrator or organisational lead is dictated by the nature of the environmental issue – for example, environmental protection agency in regards fish farms, fire services in relation to bush fires and arson, police with respect to water theft and illegal waste disposal issues, and so on. The role is envisaged as a professional officer position within the context of investigation and response to specific environmental harms. It would involve a sophisticated suite of and familiarity with practice-relevant concepts, techniques, skills, technologies, personnel, and intelligence gathering and analysis.

At the heart of the harm prevention criminalist role is brokerage. This refers to the ability to know who to link up with whom, which knowledge and techniques to be deployed in which circumstance, and how to maximise the effective use of material and human resources within existing fiscal limits and community settings. One does not need to be a criminologist to work as a criminalist, but criminology is an essential foundational field (parenthetically, it can be added that not all criminologists would wish to be criminalists – a diversity of research, teaching, policy, and practice roles exist, and 'applied criminology' of this sort is only one option).

Earlier in this article, various models and approaches to tackling illegal fishing were summarily outlined. Each of these, in turn, rests upon a much more detailed series of processes and procedures. Familiarity with this detail is vital to knowing the best fit when it comes to intervention tactics and strategies (including combinations of techniques and approaches) in specific circumstances. The criminalist can be an organising figure who assists in building the right kinds of teams, community connections, and the necessary multidisciplinary responses to specific kinds of environmental crime.

Collaborative practice

Collaboration not only involves work across areas of professional and scientific expertise (such as the Floraguard project). It is also central to practitioner engagement in combatting environmental crime. The activities and collaborations of environmental crime response agencies have tended to naturally occur around networks which are geographically-based (for example, known transit points and destinations), discipline-based (for example, environmental regulators) and commodity-based (for example, waste). Collaboration across these dimensions and involving these networks can be predominantly horizontal, vertical, or diagonal (see Figure 2).

Criminal groups and networks have the advantage generally of flexibility and a good working knowledge of local conditions and actors, which facilitate the crimes in question. In some instances, they garner buy-in by local community members and/or rely on community participation in illegal economies (Hubschle and Shearing, 2018). A collaborative response needs to mirror these attributes. For example, it can mobilise a broad range of actors, with varying types and levels of expertise, with local through to international connections, around single-purpose interventions. It should have the capacity to provide 'eyes on the ground' as well as a 'bird's eye' view of commodity chains and criminal networks. At the core of collaboration activities is information sharing. If this is accommodated and accomplished between and among the various agencies and actors within a particular group, then it opens the door to application of intelligence-led policing initiatives (based on tactical, operational, and strategic assessment of intelligence databases) as well as market reduction approaches (that target disposal markets, including handlers and consumers). These require systematic and detailed analysis of specific information. Two-way sharing of information demands that specific protocols be put into place. Accountability to local people is essential as well.

What is most important in joint working arrangements, however, is the human element. At an operational level, things seem to work best when relationships are built upon *trust*. This takes time. It also frequently involves informal as well as formal contact. Relationships of trust can take years to build – between individuals, teams/groups, agencies, and institutions. They can also take seconds to unravel (one person betraying a confidence; an event that goes pear-shaped). Resilience must be built into the equation, in part by establishing protocols, but also by ensuring that teams as well as individuals are highly engaged. At a practical level, this means that the skills of interpersonal communication are critically important (Pink and White, 2016).

Anticipating change

There is increasing criminological interest in analysing and understanding existing and future threats to environmental wellbeing (see for example, Agnew, 2011). A recent innovation

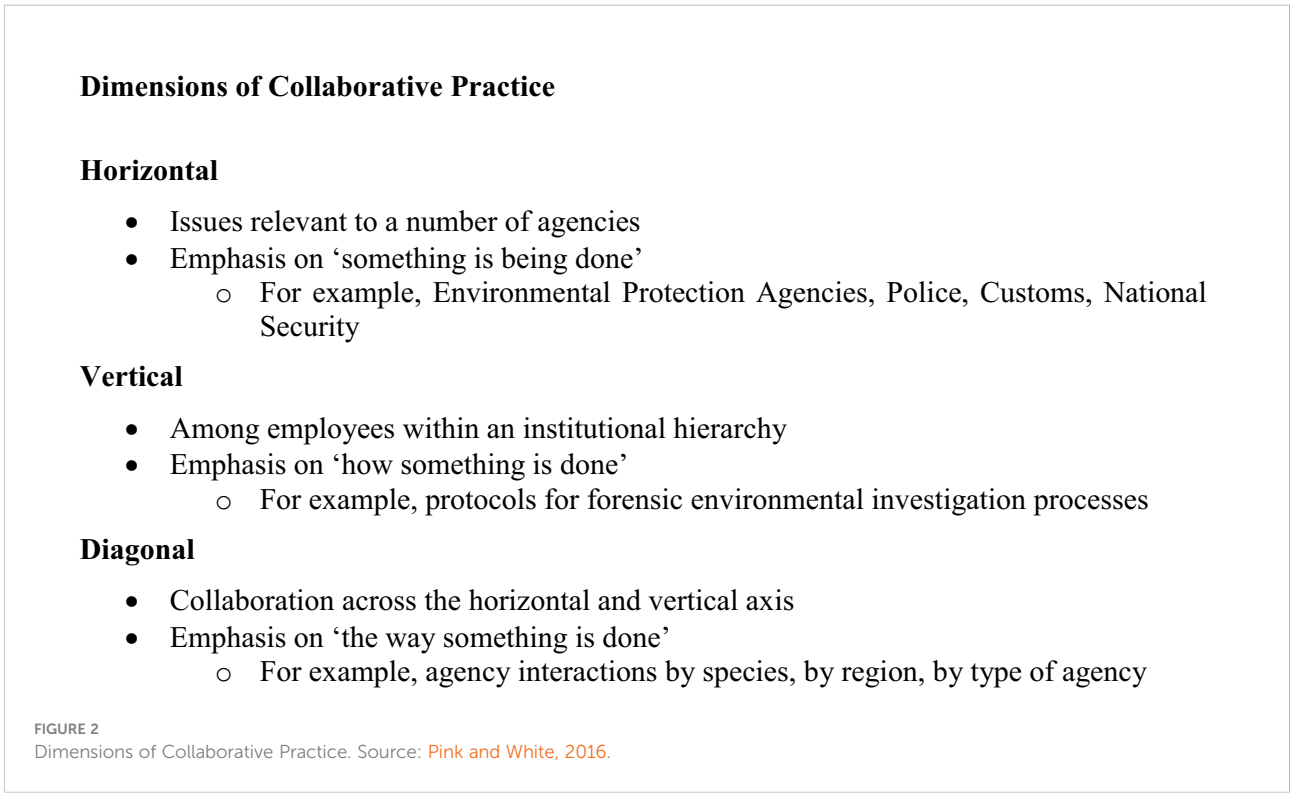

FIGURE 2
Dimensions of Collaborative Practice. Source: Pink and White, 2016.

in this area has been work coupling the analytical framework of eco-global criminology with the futures orientation of horizon scanning (White, 2011; White and Heckenberg, 2011). The result is an approach that provides a broad methodological framework that can inform the study of specific environmental harms. The various orientations in the model – *substantive* (that deals with risk, harm, and causes), *justice* (environmental, ecological species), and *futures* (based around concepts of intergenerational equity, precautionary principle, transferences over time) – are intended to provide direction and the conceptual building blocks for more detailed analysis of specific issues and trends, including those relating directly to criminality. Taken as a whole, these constitute the basis for an environmental horizon scanning exercise.

For horizon scanning, the focus of analysis is on current developments pertaining to the environment and extrapolating from these potential harms and transgressions that may be problematic in the future. Underpinning this process is the use of a mixed-methods approach that draws upon a variety of sources and data collecting strategies. The use and need for horizon scanning as an intellectual exercise and planning tool is related to the idea that many threats and opportunities are presently poorly recognised (see Sutherland and Woodroof, 2009). Accordingly, a more systematic approach to identification and solution of issues is required rather than reliance upon *ad hoc* or reactive approaches. For example, work around the implications of climate change for policing has been undertaken by the Australian Strategic Policy Institute (Bergin and Allen, 2008) and individual police practitioners (Chambers, 2011), and more recently from a criminological perspective (Mutongwizo et al., 2021). The process of horizon scanning involves detailed study of the specific trends and issues associated with environmental degradation and destruction (White and Heckenberg, 2011).

One of the key lessons of conventional crime prevention is that it ought to be based largely on a problem-solving, rather than policy-prescribed, model of intervention (Sutton et al., 2021). For this reason, future work should include discrete case studies of environmental harm, in the process developing new and innovative ways to investigate these *via* development of the harm prevention criminalist position. In this regard, it would parallel and build upon previous work on bushfire arson (Willis, 2004) and how to prevent it (Anderson, 2010). Different places and people are vulnerable to different sorts of environmental harms and crimes. A problem-solving approach to crime prevention demands specificity. While grounded in the realities of existing environmental harms today, intervention also needs to have a clear future orientation and preventative focus.

Where to from here?

The implementation tasks associated with establishment of HPC roles are interrelated and include endeavours such as:

- Constructing an inventory of the ideal attributes of a harm prevention criminalist. In other words, what kinds

of skills and knowledge are required for the position of harm prevention criminalist? This would involve the construction of an inventory of techniques and technologies, concepts and practices, associated with relevant fields and disciplines (e.g., conservation sciences, forensic studies, criminology, environmental impact assessment, restorative justice).

- Analysing regulatory, investigatory, enforcement and sanctioning practices in relation to environmental harms. We need to know how different agencies are responding to criminality and offending behaviour associated with environmental harms. This involves systematic identification of agencies involved in environmental regulation and policing (e.g., water theft), the changing legislative parameters within which they work (e.g., laws introducing a general 'environmental duty of care'), and the experiences and exposure of special emergency services to crime and harms arising from or related to environmental disasters (e.g., pollution).
- Assessing crime prevention strategies and the role of the harm prevention criminalist in responding to environmental harms. For this we need to ask what can be done proactively, utilising a harm prevention criminalist, to prevent the negative consequences of environmental harms? Work would be directed at developing strategic crime prevention plans that incorporate forward planning and training and resource needs, based on assessments of existing and projected environmental harms.
- The position of harm prevention criminalist is meant to bring together diverse skills sets, knowledge, and agencies in assessing and addressing specific kinds of environmental harm. This process would be ongoing and be informed by the accumulation of specific case studies and the development of holistic expertise.

Conclusion

Preventing environmental crime is a complicated social process. It involves bringing together different agencies (e.g., regulatory, enforcement, emergency services) and practitioners (e.g., scientists, technicians, lawyers, police, NGOs) who collaborate in various ways to address specific types of crime such as illegal fishing and illegal waste disposal. It also needs to be contextually specific in regards to geography and community. To be effective, crime prevention must be forward looking, planning oriented, and operationally 'fit for purpose'.

Criminologists concerned with analysing and understanding threats to the environment face one central question: How can we best interpret, respond to, and prevent environmental harms and crimes? To answer this, we need to seek innovative ways to conceive these issues as well as measures that will address them, according to our best appraisal of emerging needs. Environmental degradation, pollution and climate change are the most important issues humanity confronts. One response is to establish a harm prevention criminalist position – a role that can connect key stakeholders and knowledge holders so that expertise and experience is directed in the most effective and efficient manner.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material. Further inquiries can be directed to the corresponding author.

Author contributions

The author confirms being the sole contributor of this work and has approved it for publication.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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