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Environmental Forensic

NEED FOR COMPREHENSIVE GUIDELINES FOR ENVIRONMENTAL FORENSIC INVESTIGATIONS

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1. INTRODUCTION

Identifying the polluter(s) and their relative contribution to the impacts of pollution is often the primary objective of an environmental forensic investigation. Such investigations need to be carried out in a manner meeting the requirements of the legal system that is in place designed to punish the polluters. The results need to be scientifically robust, but also presented in a way that is acceptable to the legal system, judge, and jury. These are important requirements because punishment to the polluters can depend on the quality of communication, as much as the severity of the impacts of pollution.

Just as in any specialized crime area, effective communication between the investigating experts and the judiciary is a challenge in environmental crimes (Custers, 2024). The inability of the judiciary to fully understand the technical nuances involved in the case and the inability of the technical experts to fully appreciate the importance of the legal requirements are the reasons behind this. An effective way to address this challenge is having peer reviewed, clear and objective guidelines and protocols, both for investigation and for the presentation of evidence. For the investigating experts, this will save a lot of effort as (s)he knows beforehand the expectations from the judiciary. It prevents the situation where a skilled opposing advocate finds it easy to get the experts' testimony struck from the records on procedural grounds, even when the expert is competent and his/her scientific methods reliable (Samad et al. 2015). As for the judiciary, it is now left with the easier job of verifying whether the guidelines are adhered to or not.

2. EXISTING GUIDELINES FOR ENVIRONMENTAL FORENSIC INVESTIGATION

The field of environmental forensics has grown significantly over the past couple of decades, and various organizations and institutions worldwide have come up with guidelines and protocols to standardize environmental forensic investigations. The most notable and explicit guideline is the one published by INTERPOL. The "Pollution crime forensic manual" Volume I and II by INTERPOL provide guidelines on the sample collection procedure for some typical environmental crime scenarios and the subsequent documentation of the evidence (INTERPOL, 2014). A limitation of this manual when adopted for environmental forensic investigations is that it does not address the investigation in its entirety, but focuses on the sample collection and preservation procedures. INTERPOL has published specialized investigative manuals for illegal garbage discharge from vessels (INTERPOL,2018) and illegal oil discharge from vessels (INTERPOL, 2007). The INTERPOL manuals (Figure 1) are obviously from the perspective of a law enforcing officer investigating a crime scene. But, for an environmental forensic expert, guidelines on the type of forensic tools suitable for a given situation, the most suitable sampling and analysis techniques for a given situation, availability of field kits, etc. are as important as the sample collection and preservation strategies.

Apart from the INTERPOL manual, there are guidelines prepared by many regulatory agencies that implicitly address some stages, mostly the sample collection part of an environmental forensic investigation. "The inspector's field sampling manual" by Environmental Canada is one such guideline 'that has been written to provide national standards and uniformity in environmental sampling for samplers including enforcement officers, other public officers and lay samplers' (Environmental Canada, 2005). This manual focuses on sampling for investigations of suspected violations, in addition to sampling for inspections, and emergency response. In fact, "The Inspector's Field Sampling Manual" was the basis for the 'Pollution crime forensic investigation manual' as acknowledged by INTERPOL.

The United States Environmental Protection Agency (US EPA) has Environmental Crime Task Force Teams stationed at various places to better support the enforcement of environmental crime and to deter crime before it happens. The Central Virginia Environmental Crimes Task Force has prepared a 'Resource guide for the investigation of environmental crimes' (The Central Virginia Environmen-

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FIGURE 1: Manuals by INTERPOL for Environmental Crime Investigation.

tal Crimes Task Force, 2005). Although the purpose of this document is to provide practical information for the investigation of potential environmental crimes, its scope is also limited to evidence collection and preservation. There are manuals/handbooks prepared by many other US States on Environmental Crimes, like the 'New Jersey Environmental Crimes Handbook', 'Louisiana Environmental Crimes Handbook', etc., but the focus is on listing different types of environmental offenses and the legal provisions to tackle those offenses. The 'Royal Solomon Islands Police Force (RSIPF) Environmental Crime Manual', although elaborate, focuses on types of environmental offenses, legal provisions against those offenses, procedures in its trial and the punishments.

The environmental statutes of many countries have provisions regarding the procedure of collecting samples as part of environmental enforcement, for example Sections 10 and 11 of The Environment (Protection) Act, 1986 of India or Section 108 of the Environment Act, 1995 of the UK. Adherence to these provisions are important to convict the polluter, and hence important for an investigating expert to know.

The manuals, guidelines and statutory provisions discussed above do not go into detail on the vast variety of different techniques available to an environmental forensic expert. Although these manuals present very important information, the expectations from a comprehensive manual for environmental forensic investigation is that it should provide clear and in-depth details on all aspects of the investigation of an environmental crime. This would help an investigator to carry out the investigation effectively, even if (s)he is a novice to the field. More importantly, it will help the judiciary, which is otherwise not trained in the technical aspects of investigation, to verify if the procedures adopted in the investigation are scientifically sound and decide on the merits of the case.

3. SOME SUGGESTIONS FOR A COMPREHENSIVE ENVIRONMENTAL FORENSIC INVESTIGATION MANUAL

The realization that environmental crime is an important crime area has resulted in the formation of many specialized environmental crime enforcement agencies in countries across the world. There is also a suggestion to integrate environmental forensics to criminal investigation to tackle convergence of environmental crime with traditional crimes (Priya et al., 2023). Thus, there is an increasing demand for environmental forensic experts. The situation also calls for effective standards and guidelines for environmental forensic investigation. The American Society for Testing and Materials (ASTM) had set up a subcommittee,

E50.06, to frame comprehensive guidelines for environmental forensic investigation in 2005. But they could not take off due to non-technical issues (Petrisor, 2005).

The legal requirements regarding the investigation of an environmental crime may vary from place to place depending on the procedural and substantive laws in force relevant to the case at the place. However, the technical aspects like the sampling and analysis procedure to be adopted, methods to ensure integrity of samples, interpretation and presentation of the results of analyses, etc. are applicable to all jurisdictions. This allows formulation of a 'universal' technical manual for environmental forensic investigation.

There is a lot of scientific knowledge on environmental forensic investigation being generated in different parts of the world. The journal 'Environmental Forensics' focuses on publishing latest developments in this scientific area, the International Network of Environmental Forensics is a Royal Society of Chemistry group holding annual conferences to act as a forum for scientists, environmental consultants, regulators and lawyers to share information. There are also a range of excellent text books that provide detailed information on environmental forensics as a whole (Morrison and Murphy, 2015), environmental forensics methods (Mudge, 2008), as well as environmental forensics for specific groups of pollutants (Morrison and Murphy, 2006; Wang and Stout, 2007; O'Sullivan and Sandau, 2013). Over 3000 manuscripts have been published on the topic of "environmental forensics". So this is a well-researched area, yet it can still be a challenge to transfer this knowledge from the academic community into a structured legal setting. If this information, spread across different sources, can be brought to a common platform and updated periodically, it will be a great resource for the environmental forensic practitioners.

4. CONCLUDING REMARKS

Environmental forensics is important for the delivery of environmental justice. Although it is a relatively new area in many countries from a legal perspective, there has been significant scientific advancement in the area in the last two decades. Realizing the need for strict environmental crime enforcement, many regulatory agencies have recognized the importance of environmental forensics. This has resulted in the development of many basic guidelines and manuals that can be useful for environmental forensic investigations. However, considering the amount of new knowledge being generated in the area, it is time the experts in the area come together under the aegis of an international regulatory agency like the INTERPOL, to develop a comprehensive manual for environmental forensics, that covers all aspects of an environmental crime investigation.

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