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**INSTITUTE OF DIPLOMACY AND INTERNATIONAL STUDIES  
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**MA INTERNATIONAL CONFLICT MANAGEMENT**

**COMBATING ENVIRONMENTAL CRIMES IN AFRICA THROUGH  
CYBERSPACE TECHNOLOGY; A CASE STUDY OF KENYA**


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**Research Project Submitted in Partial Fulfillment of the Requirement for the Award  
of a Master of Arts degree in International Conflict Management at the Institute of  
Diplomacy and International Studies, University of Nairobi.**

**2021**

## DECLARATION

I declare that this Master Thesis is my original work and has not been presented for another academic award in any other University or Institution. Any thoughts from others or literal quotations are clearly acknowledged.


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## **DEDICATION**

This work is dedicated to my wife Elsa Atieno and our loving kids Lyon and Liam from whose motivation as well as inspiration to put more effort in my academic endeavors gave me more strength and patience to complete this research project. It is my ultimate believe and prayer that they will immensely learn from me, beginning with hard work pays, true love is innate and truth prevails. Gratitude to my Dad Israel Otieno Agina for the fatherly guidance and inspiration.

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## ABSTRACT

The field of security in the last decades has undergone a number of paradigm shift in its key concerns from the conventional security issues to emerging contemporary areas such as cyber security, hybrid threats and terrorism, which are believed to be the definite ones. The latter emerged out of heightened interdependence between society and technology and the implications as well. Environmental crimes address activities oscillate from unreported fishing, illegal and dumping hazardous wastes, depletion of the ozone layer as well as illegal logging among others. The main aim of this study was to determine how cyber space technology is adding in combating environmental crimes in Africa with a specific reference to Kenya. The focus of the study will be based on three specific objectives namely; establish the concepts of cybercrime, globalization and environmental crimes, establish policies, measures and initiatives taken to combat wildlife trafficking at a regional and global level and to find out the challenges and efforts in combating environmental crimes through cyberspace technology in Kenya.

Premised on the study's nature, a significant portion of the research findings was acquired from systematic empirical literature review of agencies dealing with environmental crimes management, scholarly contributions on cyber space technology, cybercrimes and environmental crimes and other publications on the subject matter. The findings were complimented further by interview schedule among environmental crimes management stakeholders as well as experts on the rudiment of the study from policy and academic circles. Informed conclusions and inferences were also drawn.

The study was informed by general deterrence theory in addressing the role of cyber space technology on environmental and cybercrimes management. The study noted that there is no single state institution tasked with the mandate of fighting environmental crimes in Kenya, but a number of institutions such as KWS, KFS, KEPHIS, NEMA, and NPS among others assist in combating various environmental crimes. However, to adequately address these environmental crimes, these aforementioned agencies should have an holistic and integrated intelligence network and policing agencies to apprehend and assist in the prosecution of offender. The study noted that there is no doubt that technology has changed the way wildlife trades are conducted. This includes the sale of apes, exotic birds, pangolin scales, rhino horns and ivory.

Premised on the findings of this study, the study concludes that despite the growing awareness among policy makers and scholars on environmental crimes, the issue of managing environmental crimes fails to inspire the desired response from people, communities that enforce the law and governments because it is viewed as victimless. The study recommends that the process of formulating environmental crime laws should be all inclusive with wide consultation among stakeholders' especially local communities. Additionally, environmental crime management should be highly prioritized by the government as effective environmental crime management is vital in the process of realizing Kenya's Vision 2030. Finally, this study recommends the adoption forensic science by authorities tasked with environmental crimes management.

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## ABBREVIATIONS

ABN	African Biodiversity Network
ANAW	African Network for Animal Welfare
AWF	African Wildlife Foundation
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
DNA	Deoxyribonucleic Acid
DoS	Denial of Service
EMCA	Environmental Management and Coordination Act
GPS	Global Positioning System
INTERPOL	International Police
JKIA	Jomo Kenyatta International Airport
KEPHIS	Kenya Plant Health Inspectorate Service
KFS	Kenya Forest Service
KWS	Kenya Wildlife Service
MIKE	Monitoring the Illegal Killing of Elephants
MOU	Memoranda of Understanding
NEMA	National Environmental Management Authority

NGOs	Non-governmental Organizations
NPS	National Police Service
ODPP	Office of the Director of Public Prosecution
PFM	Participatory Forest Management
RFID	Radio Frequency Identification
SMART	Spatial Monitoring and Reporting Tool
TOCs	Transnational Organized Crimes
UNEP	United Nations Environmental Program
UNODC	UN Office on Drugs and Crime
USAID	United States Agency for International Development
WCPU	Wildlife Crimes Prosecution Unit
WCMA	Wildlife and Conservation Management Act
WMD	Weapons of Mass Destruction

## **DEFINITION OF KEY TERMS**

### **Environmental crimes**

Environmental crimes addresses activities oscillate from unreported fishing, illegal and dumping hazardous wastes, depletion of the ozone layer as well as illegal logging. It includes often transnational caveat, which makes it to be significantly profitable.

### **Cybercrime**

The term cybercrime in this study is used to refer to computer-mediated crime, involving a network or a computer. Computer-mediation in this study is used to refer to utilization of computer in crime commission, or it may be actually the target.

### **Cyberspace**

The term cyberspace in this study is used to refer to dynamic and global domain marked by the combined use of electromagnetic spectrum and electronics, whose aim is to store, create, share, exchange , extract, eliminate, use inform as well as disrupt physical resources.

### **Cyber space Technology**

In this study the term cyber space technology refers to the innovations and modern technical techniques utilized in combating environmental crimes across the globe.

## **CHAPTER ONE**

### **INTRODUCTION AND BACKGROUND OF THE STUDY**

#### **1.0 Introduction to the Study**

The significance of the environment cannot be overemphasized since minus the environment, there would be no survival of plants, animals and human beings. A secure and clean environment improves the right to life. Although there has been wide champion for an environment which is more secure, supported with global agreements and conventions on the current environmental problem which is under threat, the adoption of actions to counter the same has been insufficient and dismissal, to mention the least. Governmental efforts and state have not been adequate to affect the mechanisms and principles agreed upon. While a thorough mechanism on environmental security ensures that access to the environmental services and goods is made available to everyone, majority of the Kenyans continue remaining in the cold with no ability to gain from the environment currently. Majority of the user groups are still finding deficiency to ingress environmental services and goods, bedeviled by lack of clean water, poor sanitation and a number of pollutants as well as encroachment into water catchment areas.

#### **1.1 Background of the Study**

Oblivious of the improved anti-poaching on-the-ground attempts, species of wildlife continues to be killed and their subsequent products trafficked across the world and Africa. Attempts have been made to solve this wildlife trafficking or their products via traditional commerce. However, these attempts are not adequate as wildlife trafficking has moved now to internet and platforms of social media, where the sellers and buyers can hide behind the veil of internet, hence becoming anonymous and jeopardizing the law

enforcement counter-measures.

The field of security in the last decades has undergone a number of fundamental changes in its key concerns from the conventional security issues to emerging contemporary areas such as cyber security, hybrid threats and terrorism, which are believed to be the definite ones. In the last few years, the field of security has undergone various transformations changing its main concerns from conventional security concerns to new areas such as terrorism, hybrid threats and cybersecurity, which are perceived as the most eminent ones. The latter emerged out of heightened interdependence between society and technology and the implications as well.

Worth noting is the technological growth which have been witnessed in the 21<sup>st</sup> century have not been gainful only, but they have also led to new security challenges. This involves the emerging online criminal activities which presents governments with numerous challenges. With the global connectivity growth, the political and social life has immensely changed.

The mandate of the internet during the Arab Spring in advocating for speech liberty underscores that computer networks are at the forefront defending freedom, basic rights and the rule of law.<sup>1</sup> The wrongdoings which emerge from internet, wireless communication and other associated computer networks form most of the political and socio-economic set-backs for countries across the globe. the liberty which originated from cyberspace also formed security threats, which at times is used against the citizens.

Notably, cybercrime and cyber security are gaining a major attention within the

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<sup>1</sup> Neil MacEwan (2008). *The Computer Misuse Act 1990: Lessons From its Past and Predictions for its Future*, Criminal Law Review 955

public agora. This chapter shows the emerging trends, conceptualization, and inter-linkages between environmental crimes and cybercrimes such as wildlife trafficking among others. The chapter introduces the concepts of the study and a blueprint involving methodology, the guiding objectives and the theoretical framework which informs the study.

### **1.1.1 Overview on Environmental Crimes**

Environmental crimes includes transnational caveat, which makes it to be significantly profitable. It promotes serious environmental risks, leading to food insecurity and poverty. It can have great havoc on the state as a result of organized criminal activities and graft. Those who indulge in environmental crime do so in order to meet either subsistence or commercial objectives and they entail individuals, corporate bodies, organized groups and small independent groups.

In regard to forestry sector, environmental crimes entails illegal endemic flora trade, illegal logging, sandalwood illegal trade, including bio-piracy and bio-prospecting; illegal making of charcoal, bhang growing, illegal forest fires, illegal grazing, encroachment of forest and forest excisions. Within the wildlife sector, environmental crimes entail illegal wildlife trade and their products; illegal grazing and poaching. In relation tourism sector, environmental crimes involve natural resources access blockage for the local communities, pollution, aesthetic, marine destruction, off-road driving, wastes pollution and river ecosystems. In water sector, environmental crimes include illegal riparian lands development, wetlands reclamation, pollution of water and water bodies' diversion. In regard to fisheries sector, environmental crimes involves illegal fishing by foreign fisher folk, illegal trawling, illegal fish farming, illegal methods of fishing and illegal ornamental fish trade. Other environmental crimes within the country entail

hazardous wastes as well as failure in complying with the Environmental Management and Coordination Act (EMCA) provisions and the stipulated regulations.

### **1.1.2 Overview on Cyberspace Technology**

Technological evolution across the globe has changed the way wildlife trades are conducted. This includes the sale of apes, exotic birds, pangolin scales, rhino horns and ivory. To a large extent, the internet has eliminated some of the barriers by facilitating communication, exchange of information and reconfiguring links between various parties.<sup>2</sup> Nonetheless, it is rather obvious that technology may also be instrumental to national security organs in their fights against illegal practice in wildlife. As an illustration, a Chinese authority launched a program known as “Skynet Action”, in 2013 that sought to bar wildlife criminal activities that were implemented over the internet. Drones may as well be utilized in the fight against wildlife crimes.<sup>3</sup> Most technologies used in this process included monolithic sensors that do not need to be attended by anybody to function. The technologies are able to locate suspicious sounds and locate their sources and even send real time information relating to those sounds. Some of these technologies are able to deploy drones to collect vital information relating to those sounds and other important issues using photos, infrared footages.

### **1.2 Statement of the Research Problem**

The challenges that emanate from technology whether they are sustainable and effective; as such, they have already impacted many lives differently. States and non-state actors depend largely on telecommunication and information technology for various operations.

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<sup>2</sup>Lavorgna, A. 2014. Wildlife trafficking in the Internet age. *Crime Science* 3, 5.

<sup>3</sup>UNEP, 2013a. A new eye in the sky: Eco-drones. *Global Environment Alert Service Bulletin*, May 2013. United Nations Environment Programme. <<http://www.unep.org/geas/>> (accessed 16.06.014).



Every meaningful effort geared towards fighting environmental crimes should focus on ensuring that communication methods between various parties especially those involved in perpetrating criminalities are monitored. This is because most of technologies in existence right now allow land and sea to be scanned through remote trigger systems, aerial drones and satellites.

Despite efforts to combat environmental crimes, there are challenges with inadequacy of the provisions and policies, as well as transnational coordination, national capacities, among other challenges. As Kenya translates into an information society, it faces a number of cyber related challenges. One such threat emanates from the fact that criminal organizations and hackers from all over the world are likely to exploit the vulnerabilities within national system. This applies to every other nation that turns to using information. Despite the various studies on technology and crimes particularly cyber security, there is inadequate research on the role cyberspace technologies in combating environmental crimes. The study will therefore focus on cyberspace technology in combating of environmental crimes in Kenya.

### **1.3 Research Questions**

The study was informed by the following research questions:

- (a) What are concepts and dynamics of cybercrime, globalization and environmental crimes?
- (b) Which policies, measures and initiatives are being taken to combat cybercrimes at a regional and global level?
- (c) Which challenges and efforts are being carried out in combating environmental crimes through Cyber space technologies in Kenya?

## **1.4 Objectives of the Study**

Overall, the study aimed at determining the effect of cyberspace technology in combating of environmental crimes in Kenya. To realize this objective, the specific ones will be:

- (a) To establish the concepts of cybercrime, globalization and environmental crimes.
- (b) To evaluate the policies, measures and initiatives taken to combat wildlife trafficking at a regional and global level
- (c) To determine the challenges in combating environmental crimes through cyberspace technology in Kenya

## **1.5 Literature Review**

The following section seeks to cover empirical literature based on the specific objectives drawing of various scholarly arguments and possible criticism.

### **1.5.1 Concepts of Cybercrime, Globalization and Environmental Crimes**

While cybersecurity refers to safety provisions that shall protect cyberspace, ‘cybercrimes’ are the actual criminal actions that threaten the security. Nevertheless, the term cybercrime does not cover every offense committed over cyberspaces. For instance, the term does not cover cyber-warfare and cyber-terrorism.<sup>4</sup> Although the clear criteria for defining various cyber offenses internationally are yet to develop, cyber-warfare might be likened to armed attacks that occur between states whereas cyber-terrorism primarily generates fear due to destruction and violence based on ideological goals.<sup>5</sup>

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<sup>4</sup> C.A. Theohary and J.W. Rollins, ‘Cyberwarfare and Cyberterrorism: In Brief’, Congressional Research Service (27 March 2015), at 2.

<sup>5</sup> S. Gordon and R. Ford, ‘Cyberterrorism?’, Symantec Security Response White Paper, at 4, available at <<https://www.symantec.com/avcenter/reference/cyberterrorism.pdf>>. Accessed 19 September 2019

Kigen et al<sup>6</sup> noted that cybercrime may refer to acts which are unlawful where the computer is utilized as a tool, a target or as well as both which threaten the security of the nation as well as financial health. Both non-governmental and governmental officials engage in cybercrimes ranging from cross border crime, financial theft as well as espionage. In short, cybercrimes mean any criminal activity conducted with the assistance of computer system. Consequently, the term cybercrime may also be defined as an act of omission or an act committed in contravention to the law commanding or forbidding it and for which punishment is upon conviction imposed. Halder and Jaishankar<sup>7</sup> noted that other terms represent the cybercrime as a criminal act linked to the utilization of computers, particularly illegitimate trespass into the database or computer system of another, theft or manipulation of the online or stored data, or equipment sabotage as well as data.

Agboola<sup>8</sup> noted that therefore connectivity has increased on assisting individuals to make an assessment of the market information as well as relevant services which is assisting in making life more bearable for most people. Siddique and Rehman<sup>9</sup> however opine that that technology is growing at a high rate within the modern world. Due to its significant, almost every individual with computer-based knowledge has resolved in the use of the fast-growing industry. In fact, technology has revolutionized the world to appear

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<sup>6</sup> Kigen, P. M., Muchai, C., Kimani, K., Mwangi, M., Shiyayo, B., Ndegwa, D., & Siyanda, S. (2017). *Kenya Cyber Security Report 2015*. Serianu Limited.

<sup>7</sup> Hannan, M., & Blundell, B. (2014). Electronic Crime-it's not only the big end of town that should be worried. In *Australian Computer, Network & Information Forensics Conference* (pp. 94-102).

<sup>8</sup> Agboola, A. (2007). Information and communication technology (ICT) in banking operations in Nigeria—An evaluation of recent experiences. *African Journal of Public Administration and Management*, 18(1), 1-102.

<sup>9</sup> Siddique, I., & Rehman, S. (2011). Impact of Electronic Crime in Indian Banking Sector-An Overview. *International Journal of Business & Information Technology*, 1(2).

to be a very small village for generations in the modern world. However, the utilization of technology has led to evolving of cybercrimes.

Lakshmi and Ishwarya<sup>10</sup> noted that today cybercrimes such as hacking, phishing, cyber terrorism and spamming has triggered significant concern around the globe as a result of drastic changes in the reported cases. Kshetri<sup>11</sup> reported that as matter of fact, daily, an emerging cybercrime is reported. Notably, cybercrime is the most ruthless form of computer crime within the modern world which has led most people to lose their most highly confidential information to the cyber attackers. To complicate the matters, majority of the perpetrators go minus being identified or detected as well.

Cyber security is rising at a very high rate. The spending on cyber security globally was estimated at \$77 billion (USD); this was projected to rise to about \$170 billion (USD) by the year 2020 (last year). The U.S government has incurred about \$100 billion over cyber security for the past decade and has about \$100 billion budget for cyber security in the year 2019. Cyber security intrusions are costing business a tune of upto \$600 billion annually, which involves damage directly plus disruption of after the attack on the business normal operations; this does not entail the diverse cyber-attacks which are not reported as a result of prospect of legal act against those which own up to the cybercrimes as well as fear of damage to the reputation of the organization which may bear a negative effect on

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<sup>10</sup> Lakshmi P. and Ishwarya M. (2015), *Cyber Crime: Prevention & Detection*," International Journal of Advanced Research in Computer and Communication Engineering, vol. Vol. 4(3).

<sup>11</sup> Kshetri, N. (2015). Pattern of global cyber war and crime: A conceptual framework. *Journal of International Management*, 11(4), 541-562.

revenues, retention rates, customer acquisition, valuation of the company when raising capital and the ability select the top talents.<sup>12</sup>

Illegal mining does not restrict itself to illicit extraction of mineral resources, but it also extends to other activities that impacted the environment negatively. Some of those activities include mercury pollution that emanate from gold mining, pollution, environmental activities that degrade landscape, destruction of fauna and flora, radiation hazards that impact negatively errand land, trees and economic crops.<sup>13</sup> In this respect, a broad understanding of these crimes extend to exploitive financial activities that result from exploitation of natural resources, illegal trade of hazardous chemicals and wastes, and laundering. Over the last few years, environmental crimes have attracted global attention due to their deleterious and serious effects on ecosystem and environment together with their subsequent effects on development, security and peace.

At the moment, environmental crimes are considered to be among the profitable types of activities committed across boundaries. In 2016, they were valued at between 91 and 259 US billion dollars on annual basis. This ranked them fourth among the most serious crimes in the world just behind human trafficking, drugs and counterfeits. The estimate corresponded to 26% increase in comparison to their value in 2014 implying that they had intensified rather than diminishing. At this rate, the crime is expected to increase at a rate

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<sup>12</sup> Otieno, E. O., & Kahonge, A. M. (2014). Adoption of Mobile Payments in Kenyan Businesses: A case study of Small and Medium Enterprises (SME) in Kenya. *International Journal of Computer Applications*, 107(7).

<sup>13</sup> Ibid

of between 5 and 7 percent every year.<sup>14</sup>

Even if there is no universal agreement on the term environmental crime, it is anonymously agreed that it encompasses illegal activities that harm the environment while they benefit individual people or groups of companies that exploit, damage, trade and even steal natural resources. Most of these criminal activities tend to be organized by those involved in them with the help of other people especially those in government. These types of crimes endanger wildlife and ecosystem due to pollution that emanate from unregulated use of harmful chemicals, destruction of livelihoods and excessive deforestation.<sup>15</sup>

Illegal trades on their part range from bush-meat poaching to terrorism that result from some of these activities. Based on the causality and complexity of the history of some of environmental crime related issues, there lacks a clear understanding of the responses that would be most appropriate to those issues. The illegal exploitation of natural resources affects negatively the income that comes from diamonds, charcoal, oil, fisheries, gold, mining, timber and tourism.<sup>16</sup>

All these natural resources are able to produce revenue for development purposes in infrastructure, sustainable development, schools and health care. As a result of this, the illegal trade that occurs within natural resources competes unfairly with legitimate practices because no tax is paid for such activities. This is evident from the current estimates of those illegal activities that ranges between US\$9 and 259 billion, which is 1 or 2 times the size of ODA globally. This means that the global community loses about

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<sup>14</sup> “The Environmental Crime Crisis,” in A Rapid Response Assessment, ed. Christian Nellemann (Nairobi and Arendal: GRID Arendal; UNEP).

<sup>15</sup> “Synthesis of the 2014 Reports of the Scientific Environmental Effects, and Technology & Economic Assessment Panels of the Montreal Protocol “ (UNEP)

<sup>16</sup> Ibid

US\$9 to 259 billion every year because illegitimate activities occur in parallel with the legitimate ones. Accordingly, it undermines good governance and tax levied on legitimate business practices within natural resources and other areas. In spite of this, the money accrued from these activities is re-introduced into legitimate economies through consumption and money laundering.<sup>17</sup>

### **1.5.2 Policies, Measures and Initiatives Taken to Combat Wildlife Trafficking**

A study recently by Duke University established that the modern technologies may give policymakers and scientists a more reliable way in identifying the species at the greatest poaching risk and assist them in adopting measures to safeguard the wildlife before it becomes too late.<sup>18</sup> *‘The gap between what we actually know and what we might not be aware of the global biodiversity is tremendous still, though technology growth is going to acquire a key mandate in closing it and assisting us in intelligently conserving more biodiversity and with more efficacy, ’* indicated Lucas Joppa, a scientist and conservationist in Cambridge at Microsoft’s Computational Science Laboratory within the United Kingdom.<sup>19</sup> Technological enhancement is key priority to majority of the governments. The National Strategy for Combating Wildlife Trafficking for the United States Government which was published in 2014, reiterated on the significance of

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<sup>17</sup> . “Green Carbon, Black Trade: Illegal Logging, Tax Fraud and Laundering in the Worlds Tropical Forests,” in A Rapid Response Assessment (GRID-Arendal: United Nations Environment Programme). “Resolution 2195 (2014),” United Nations Security Council, [http://www.un.org/en/ga/search/view\\_doc.asp?symbol=S/RES/2195%20\(2014\)](http://www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/2195%20(2014))

<sup>18</sup> Pimm, S., Jenkins, C., Abell, R., Brooks, T., Gittleman, J., Joppa, L., Raven, P., Roberts, C., Sexton, J., 2014. The biodiversity of species and their rates of extinction, distribution, and protection. *Science* 344, 987-997.

<sup>19</sup> IUCN, 2014. Press Release - New technologies making it easier to protect threatened species. <<http://www.iucnredlist.org/news/new-technologies-making-it-easier-to-protect-threatened-species>> (accessed 17.06.14)

disseminating and developing accurate and cost-effective tools.<sup>20</sup>

Meanwhile, in 2014 via the United States Agency for International Development (USAID), the US government launched the Technology Challenge over Wildlife Trafficking. The grant program is mandated for the purpose of engaging the brightest and the best entrepreneurs and scientists in utilizing technological solutions in combating of the illegal wildlife trade.<sup>21</sup> The Secretariat for CITES has taken a key mandate in collaborating jointly with the private sector to make investment in emerging and new technologies and in specific through an investment impact fund to be referred to as Endangered Species Technology and Innovation Fund.<sup>22</sup> This fund seeks to make crucial investments in contemporary technologies in ensuring sustainable, traceable and wildlife legal trade.

New tools should entail should entail those that can lead to legally admissible evidence utilized within the courtroom. Although the judicial system jeopardizes law enforcement attempts to countering of illegal trade- only around 27 arrests were made in reference to 1, 885 confiscated great apes between the year 2011 and 2016 and a fourth of those 27 arrests were not prosecuted-adoption of technology assumes a paramount mandate within the courtrooms.<sup>23</sup> In countries such as Guinea and Congo in Africa, secret cameras

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<sup>20</sup> White House, 2014a. National Strategy for Combating Wildlife Trafficking. US White House. <<http://www.worldwildlife.org/publications/national-strategy-for-combating-wildlife-trafficking>> (accessed 16.06.14).

<sup>21</sup> White House, 2014b. Wildlife Trafficking Technology Challenge. Solicitation Number: SOL-OAA-14-00051. <<http://www.whitehouse.gov/sites/default/files/docs/nationalstrategywildlifetrafficking.pdf>> (accessed 17.06.14).

<sup>22</sup> World Economic Forum, 2013. Creating the Business Case for CITES: A New Financial Mechanism. Global Agenda Council on Governance for Sustainability. <[http://www3.weforum.org/docs/GAC/2013/WEF\\_GAC\\_GovernanceSustainability\\_GreenLight\\_October\\_Report\\_2013.pdf](http://www3.weforum.org/docs/GAC/2013/WEF_GAC_GovernanceSustainability_GreenLight_October_Report_2013.pdf)> (accessed 17.06.14).

<sup>23</sup> UNEP, 2014. UNEP Year Book 2014: Emerging Issues in our Global Environment. United Nations Environment Programme, Nairobi.



footage of wildlife notorious dealers recorded him making admission to exportation of over 500. This proof assisted in sentencing him to one year in jail according to the wildlife trade standards regulations. Conversely, the new technologies cannot make substitution of anti-poaching traditional measures. Some technologies might not be relevant for being utilized in environments of minimal capacity, where there is novice technical assistance or expertise.

Nellemann et al.<sup>24</sup> noted that a sustainable solution will require attempts in addressing supply and reducing of demand, utilizing methods which promote alternative livelihoods, behavioral change, legal enforcement, transparency and deterrence. Moreover, Lawson and Vines<sup>25</sup> asserted that broader collective action is required, and should entail harmonizing and strengthening of environmental laws as well as significant support to those with resources which are insufficient to enforcement of smugglers and legislations prosecution. Additionally, empirical findings and international crime mapping illegal trade and syndicates of wildlife would be paramount.

Nellemann et al.<sup>26</sup> additionally noted that the contemporary technologies being employed in countering of illegal trade of wildlife offering hope and will continue in leading a significant mandate in conservation. Significant investment is required to provide support to the technological increase use by the national governments, law enforcement

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<sup>24</sup> Nellemann, C., Henriksen, R., Raxter, P., Ash, N., Mrema, E. (Eds). 2014. The Environmental Crime Crisis – Threats to Sustainable Development from Illegal Exploitation and Trade in Wildlife and Forest Resources. A UNEP Rapid Response Assessment. United Nations Environment Programme and GRID-Arendal, Nairobi and Arendal.

<sup>25</sup> Lawson, K. and Vines, A. 2014. The Costs of Crime, Insecurity, and Institutional Erosion. Chatham House. <<http://www.chathamhouse.org/publications/papers/view/197367>> (accessed 16.06.14).

<sup>26</sup> Nellemann, C., Henriksen, R., Raxter, P., Ash, N., Mrema, E. (Eds). 2014. The Environmental Crime Crisis – Threats to Sustainable Development from Illegal Exploitation and Trade in Wildlife and Forest Resources. A UNEP Rapid Response Assessment. United Nations Environment Programme and GRID-Arendal, Nairobi and Arendal.

agencies and wildlife. Emerging technologies offer also opportunities for the collaboration with military contractors and private sector companies which bears the skill in transforming simple innovations-a mobile phone application, a metal detector and a toy airplane.

### **1.5.3 Challenges in Combating Environmental Crimes through Cyberspace Technology**

As a transit crime, wildlife trafficking has far-reaching implications in any society. It does not only affect the environment severely by impacting biodiversity, but it also hinders development in many communities.<sup>27</sup> Environmental crimes are a growing concern to security at global and national level because they run in parallel to other crimes and they even support other crimes such as guerilla insurgency. This poses risks to global health because it impacts the care for animals.<sup>28</sup> Currently, it is estimated that the black market for wildlife is worth between 6 and 10 billion dollars on annual basis. Most of these activities occur between developing and developed economies with developing ones being the losers.

The European Union for instance is considered an importer for wildlife especially reptile skins and different types of birds. In spite of this, wildlife trafficking does not receive the global attention it deserves. In addition, very little effort has been put in developing laws related to wildlife and agendas related to wildlife.<sup>29</sup> To make the matter worse, most of the governments in the world consider this issue as a mere environmental issue that does not need much attention. As a result, very little effort is geared towards

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<sup>27</sup>Sollund, R. (2011). Expressions of speciesism: the effects of keeping companion animals on animal abuse, animal trafficking and species decline. *Crime, Law and Social Change*, 55(5), 437–451

<sup>28</sup>Dalberg. (2012). *Fighting Illicit Wildlife Trafficking: A Consultation with Governments*. Report. Gland (Switzerland): WWF.

<sup>29</sup>IFAW. (2008). *Criminal Nature: The Global Security Implications of the Illegal Wildlife Trade*. Report, Yarmouth Port, MA: International Fund for Animal Welfare

investigating issues related to wildlife.<sup>30</sup> For this reason, the people who violate laws related to wildlife do not face full consequences for their activities. Hence, wildlife trafficking is regarded as low-risk and high profitable by those who engage in it.

Normally, the demand for environmental resources is largely influenced by consumer groups and cultural practices.<sup>31</sup> As a result, some of wildlife related products are smuggled either locally or internationally due to their perceived values in traditional practices, medicine and gourmet dining. In other instances, they are considered to be symbols of status like in Saudi Arabia. These products are also poached for pet shops and private collection. In other instances, the demand is influenced by science for scientific purposes and other practices.<sup>32</sup>

As for supply, the range of reasons varies widely. Some are individual in nature whereas others are sophisticated.<sup>33</sup> Zimmerman identifies local farmers in their attempts to supplement their meager incomes, international smugglers and mafias within developing countries as the three groups of people who traffic wildlife.<sup>34</sup> There are strong evidences that link individuals especially opportunistic villagers to the initial stages of supply chains within wildlife trafficking. Nevertheless, at international level there is some level of sophistication within the supply chain. This involves experienced people with

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<sup>30</sup>Zimmerman, ME. (2003). The black market for wildlife: combating transnational organized crime in the illegal wildlife trade. *Vanderbilt Journal of transnational Law*, 36, 1657–1689.

<sup>31</sup>Dalberg. (2012)Op cit

<sup>32</sup>Sollund, R. (2011). Expressions of speciesism: the effects of keeping companion animals on animal abuse, animal trafficking and species decline. *Crime, Law and Social Change*, 55(5), 437–451.

<sup>33</sup>IFAW. (2008). *Criminal Nature: The Global Security Implications of the Illegal Wildlife Trade*. Report, Yarmouth Port, MA: International Fund for Animal Welfare.

<sup>34</sup>Zimmerman, ME. (2003). The black market for wildlife: combating transnational organized crime in the illegal wildlife trade. *Vanderbilt Journal of transnational Law*, 36, 1657–1689.

organizational layers able to overcome various challenges.<sup>35</sup>

Much of the attention against wildlife trafficking has been directed towards organized criminal groups such as terrorists and militias to the extent that the International Fund for Animal Welfare indicated that in its latest report that illegal trade within wildlife resources has turned to organized crime. Whereas this assertion appears far-fetched, there is some truth in it relating to sophistication in the organization of criminality within wildlife resources. This is particularly true especially in caviar smuggling and fur trade. Some of these activities might be combined with other contraband activities via money laundering or pre-determined trafficking routes.<sup>36</sup>

The Constitution of Kenya establishes the ODPP, outlining the mandate of the institution, and the powers of prosecution the institution carries (2010). The ODPP is composed of various units for prosecuting all types of crimes, one unit being the Wildlife Crimes Prosecution Unit (WCPU), which only prosecutes wildlife crimes.<sup>37</sup>The Kenya Wildlife Service (KWS) has a Security Division, which is composed of an intelligence branch and an investigation branch. The Security Division is charged with preventing and eliminating poaching, protection of wildlife and people in protected and non-protected areas, as well as training its frontline officers. Not only does the Security Division work in national parks and reserves, but it also works at the Kilindini Port in Mombasa, the Moi International Airport in Mombasa and Jomo Kenyatta International Airport (JKIA) in

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<sup>35</sup>Pires, S, & Clarke, RV. (2012). Are parrots CRAVED? An analysis of parrot poaching in Mexico. *Journal of Research in Crime and Delinquency*, 49(1), 129–146.

<sup>36</sup>Wyatt, T. (2009). Exploring the organization of Russia Far East's illegal wildlife trade: two case studies of the illegal fur and illegal falcon trades. *Global Crime*, 10(1–2), 144–154.

<sup>37</sup>Ogoma, R. 2017, *op. cit.*

Nairobi. Officers who work at the Port and Airports must profile passengers and cargo for wildlife products being trafficked in or out of the country.<sup>38</sup>

The ODPP's Wildlife Crimes Prosecution Unit was established in 2014 and is mandated to prosecute any crime in relation to WLC. The unit is not limited in its decisions to charge, in other words, the unit is able to charge crimes using the Wildlife and Conservation Management Act (WCMA), 2013, but has discretion to charge using subsidiary legislation, as well as international cooperation tools. International cooperation tools that guide prosecution of WLCs in Kenya shall be discussed in this thesis. Currently, KWS has two investigators who are gazetted in the Government Gazette to prosecute WLCs, however, any KWS led prosecutions are conducted in accordance with the WCMA only. Any other case that seeks to go beyond the WCMA requires the ODPP's WCPU to prosecute.<sup>39</sup>

## **1.6 Justification of the Study**

This study seeks to inform three distinctive categories, namely; policy justification, academic justification as well as the general public. The categories justification are thematically discussed below

### **1.6.1 Policy Justification**

On policy justification, the study will benefit with the current environmental crimes mitigation measures by the government, societies, NGOs that focus on the technology and internet. The findings and recommendations will inform policymakers, law enforcement officers by providing understanding and best practices for combating cybercrime. The

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<sup>38</sup>Piquero, A. R., Paternoster, R., Pogarsky, G., & Loughran, T. (2011). Elaborating the Individual Difference Component in Deterrence Theory. *Annual Review of Law and Social Sciences*, 7, 335-360.

<sup>39</sup> Ibid

study will also be of significance to local and international agencies that deal with environmental crimes and cybercrimes with the aim of partnering with stakeholders in Kenya, regionally and internationally. Stakeholders can use this information to guide their engagement in Kenya in promoting current initiatives and inform them on news risks and how to mitigate them. The results of this study will also be informative to policy makers in the formation of Cybercrime laws and policies.

### **1.6.2 Academic Justification**

One of the main beneficiaries for research is normally the academic field and disciplines. This study seeks to form a foundation for scholarly referencing and knowledge gaps in combating environmental crimes, cyberspace technology and cybercrimes. It seeks to make suggestions for further studies which may be explored by future scholars and academicians through supplementing their works on the impact of cyber technology in managing of environmental crimes. It will also form vital theoretical anchoring which will be utilized to inform the future studies of various scholars. Conversely, this study will actually try to utilize in-depth systemic analysis and point out some of the scholarly gaps left out in some of the empirical studies by exploration of new concepts, theoretical approaches as well as objectives on the issue of environmental crimes and adoption of modern cyber space technology in managing such crimes. .

### **1.6.3 To the General Public**

Currently, there is an increase in natural resources scramble within the modern world due to increase in population and demand for natural environmental products. The long term effects of this are pollution, depletion of ecosystem, food insecurity and increase in transnational organized crimes (TOCs) syndicates. This study seeks to sensitize the

general public on the importance of environmental protection in order to improve human security by pointing out towards possible environmental areas within the country (Kenya) which should be protected from any form of encroachment and human activities such as agriculture. Additionally, the study seeks to create awareness to the general public on the effects of environmental crimes on their livelihoods and the need of embracing alternative source of livelihoods.

## **1.7 Theoretical Framework**

This study was guided by general deterrence theory which integrates with the elements of the dependent and independent variables of the study.

### **1.7.1 Deterrence Theory**

The proponents of Deterrence Theory in 1764 are Cesare Beccaria and Jeremy Bentham in 1781. The authors main area of interest is on what makes it possible to discourage people from committing any kind of activities whether bad or good by using counter measures to deter those activities. The counter measures in this case might include disaster recovery measures, insurance, back-ups, training and/or education. Additionally, the theory denotes that most of the people point to the need of deterring criminal actions after a relatively high profile incident under which an offender is perceived to have been given a light sentence. Some are of the argument that sentences which are tougher would have deterred the tragedies and can deter the re-occurrences of such tragedies.

Once these measures are developed, they can be utilized to either mitigate risks or increase risks based on expected outcomes. For the bad behaviors, the measures could be

utilized to inflict pain on the people who commit offenses.<sup>40</sup>

In cybercrime, the theory could be utilized to develop defense mechanisms in relation to attacks that attackers implement online. For instance, severe penalties might be developed against people who attack others online or who steal personal details from other people. Stricter measures could also be developed against those people to discourage others from engaging in similar activities. With such measures, other people would be discouraged from engaging in cybercrimes. The theory is applicable to the study because it highlights the importance of defense mechanisms to managers and administrators of online platforms in terms of cost of attack and deterrent measures put in place. Additionally, this theory is relevant to the study since it indicates how cyber space technological innovations such surveillance tools can serve as a deterrence tool for potential environmental offenders in Kenya.

## **1.8 Research Methodology**

This research section offered the methodology of research and thematic study areas under the following highlighted themes; site of the study, the design of the research, the study target population, sample and sampling techniques, the instruments of data collection, data analysis as well as ethical considerations.

### **1.8.1 Research Design**

The study is largely exploratory in nature and it makes use of questionnaire to interview respondents to obtain qualitative data. Every questionnaire addresses itself to specific areas in line with overall objectives and it is conducted on people in the sample. The use of qualitative technique allows the researcher to collect reliable insights into the

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<sup>40</sup> Sullivan, L. E. (Ed.). (2009). The SAGE glossary of the social and behavioral sciences. Sage.

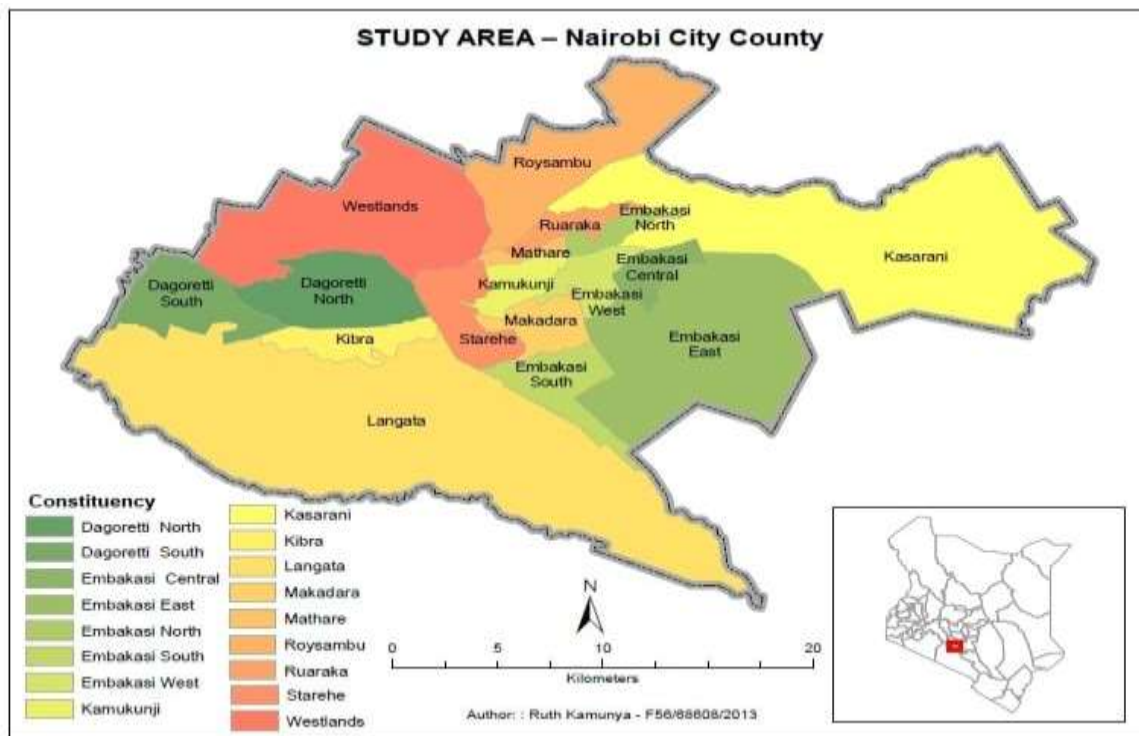


feelings and attitudes of the study respondents.

### 1.8.2 Study Sites

The site of this study was Nairobi County in Kenya through key institutions that are relevant to combating environmental crimes. These serve as best case studies due to the city being the hub and headquarter of government institutions, international organizations and other stakeholders' networks on international affairs and security. It provided a broad perspective and triangulation that illustrated various dynamics of cybercrime. The study reviewed also previous publications on data collected by empirical studies.

**Figure 1: Map of the Study Area**



**Source: Independent Electoral Commission (IEBC, 2019)**

### 1.8.3 Study Population

This population consisted of people stakeholders in cybercrimes and environmental crimes

and initiatives spearheaded by the government and communities themselves.

#### **1.8.4 Sample Size Determination**

This triangulation methodology improved on validity and credibility of the findings. This entailed utilizing of more than one institution and individual from various areas and spreading the figure across all the sites to collect data. the interviews will cut across the population of the study which involved: private entities, public entities, security agencies, government officials as well as community leaders among others.

#### **1.8.5 Data Collection**

Primary data was gathered through scheduled interview guides. The interviews were carried out through interview guides pretest which were administered to the sample population of the study. The interview schedule adopted opened-ended questions for the aim of collecting important and relevant information from the respondents for the study's clarity. The questions were premised on the variables of the study. Email was adopted as ways of collecting primary data from the targeted respondents. The data collection research instrument was tested for reliability and validity before use.

According to Kothari and Garg, reliability refers to a process in which same results are obtained from an instrument after repeated trials.<sup>41</sup> The lesser the instrument variation produces in retest measurements of a given attribute, the greater the reliability. in order to improve on reliability, the researcher made sure that the questions of the interview drawn from the research are coded accurately. The study sought peer review to make sure that the constructed research instruments are sound in content and well-structured after which the

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<sup>41</sup>*Ibid*

supervisor was requested in reviewing as well and give his input or opinion. In conclusion, this study divided the response obtained from the interview into two similar halves in an attempt to ensure reliability and additionally scored them independent to confirm on possible correlation. This study carried out a pilot study to ascertain the relevance of the questions.<sup>42</sup>

This study tested the validity of the instruments in order to ascertain the research instruments effectiveness. Validity normally applies to both the methods and the design of your study. Validity in collection of data implies that your finding represents truly the kind of phenomenon you claim to be measuring. In this study, the content validity of the study was ascertained through seeking of the help of experts and supervisors in security management as well as conflict management and cybercrime experts from the cybercrime unit whose views were important to the study's validity. Construct validity was ensured through comparing the findings of the study with other empirical scholarly works or findings.

### **1.8.6 Data Analysis and Representation**

The data was collected using structured questionnaires guide and analysed using the (SPSS) version. Content analysis was used to draw conclusions on the study subject. Additionally, data were presented in forms of written statements and direct quotes, back up by secondary data, retrieved from secondary sources. Data obtained was analysed to get the objectives and the hypothesis of the research. Raw data was filtered first to ensure it supports the overall study. Qualitative data analysis was applied to determine the impact

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<sup>42</sup> Malhotra, K. *Marketing Research: An applied Orientation* (4th edition). New Jersey, USA: Pearson Education, Inc. 2004

of cybercrimes in Kenya. In a nutshell the study undertook rigorous content data analysis of material gathered from interviews and questionnaires. The analysis approach must guarantee the integrity of the entire study and its contribution to the collection of knowledge on wildlife trafficking. Both collected qualitative and quantitative data were analyzed using both inferential and descriptive methods. This was presented in form of tables, figures, and percentages. Qualitative data was analyzed through the thematic analysis.

### **1.8.7 Ethical Considerations**

In relation to ethical considerations, the respondents in this study were taken through the aim of the study prior to being requested to take part in the study. Throughout this process, the voluntary participation principle and informed consent requirement was emphasized in guaranteeing high confidentiality level; thereby, every data obtained from respondents was handled confidentially. To ensure that this was obtained, the timing and location of the study was never disclosed to anyone. In addition, their identities were never shared with anyone. This encouraged the respondents to take part in the study and provide credible information. Furthermore, the necessary permissions were obtained from relevant authorities before the study was conducted.

## **1.9 Chapter Breakdown**

### **Chapter One: Conceptualization and Introduction Issues**

The first chapter of this study seeks to give a highlight of the study area. It begins with a preamble on the background of the study, outlines the problem of the study, theoretical framework of the study as well as justification upon which the study shall be anchored upon. Finally the chapter seeks to deliberate on the kind of the methodology which will be

used. It shows the various types of data which are relevant in responding to the research questions, data collection methods and sources of data

### **Chapter Two: Concepts of Cybercrime, Globalization and Environmental Crimes**

The second chapter of this study addressed on the first objective of the study which seeks to deliberate on the concepts of cybercrime, globalization and environmental crimes. It presented emerging concepts and ideas in regard to environmental crimes and cybercrimes by drawing a number of quantitative analysis, qualitative and empirical support.

### **Chapter Three: Policies, Measures and Initiatives Taken To Combat Wildlife Trafficking At A Regional and Global Level**

This section looked at the policies, measures as well as initiatives which have been taken in controlling wildlife trafficking at the global and regional level. The chapter sought to address the main anticipated study outcome of the objective by critically looking at how effective policies and regulations are addressing the challenge of wildlife trafficking.

### **Chapter Four: Challenges in Combating Environmental Crimes through Cyberspace Technology in Kenya**

The fourth chapter of the study sought to deliberate on the challenges in combating environmental crimes through cyberspace technology in Kenya. It seeks to address some of the legal, personnel, political and technical challenges facing various state agencies and regional integrations in the management of environmental crimes in the country.

### **Chapter Five: Summary of Findings, Conclusions and Recommendations**

The final chapter seeks to make conclusions on a number of issues raised and make holistic recommendations on addressing some of the key issues deliberated on the preceding subsequent chapters.

## CHAPTER TWO

### CONCEPTS OF CYBERCRIME, GLOBALIZATION AND ENVIRONMENTAL CRIMES

#### 2.1 Introduction

As a result of this, there is high level of interdependence both locally and internationally thanks to information technology. All these developments promote economic development, peace and political development. However, they pose serious challenges due to social fragmentation that expose people to conflicts and violence.<sup>43</sup> Because of this economic crisis extend beyond state borders thereby they produce hardships at global level. All of these aspects make up globalization despite the serious security implications they have on it. It would be worthwhile noting that the spread of knowledge, movement of people and spread of advanced technologies has increased threats at global level.

#### 2.2 Concepts of Cybercrime

Douglas and Loader<sup>44</sup> noted that cybercrime can be denoted as computer mediated acts carried out through the global electronic networks which are either regarded to be illegal by particular parties. Anderson et al.<sup>45</sup> reiterated that cybercrimes can be classified into four key categories; for instance cyber-trespass, cyber-violence, cyber-pornography and cyber deceptions which may be defined as immoral activities entailing intellectual property violations, credit card fraud and stealing.

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<sup>43</sup> Love, C. M. (2010). *Beyond Sovereignty: Issues for a Global Agenda*. New York: Engage Learning page number?

<sup>44</sup> Douglas, T., & Loader, B. D. (2000). *Cybercrime: Security and surveillance in the information age*: Routledge.

<sup>45</sup> Anderson, R., Barton, C., Böhme, R., Clayton, R., Van Eeten, M. J., Levi, M. & Savage, S. (2013). Measuring the cost of cybercrime. In *The economics of information security and privacy* (pp. 265-300). Springer Berlin Heidelberg.

There are a number of cybercrimes being witnessed among various industries in Kenya such as social engineering, phishing, money laundering and swapping of mobile Sim-Cards. Notably, in a nutshell all the cybercrimes are orchestrated with the ultimate aim of gaining illegitimate access to the accounts users, stealing and transferring of funds to undisclosed account. In a number of cases, the cybercrimes use the banking accounts pre-requisites such as passwords, certificates, ID or PIN to access dormant accounts and steal either huge sums of money or little; whereas under some circumstances, they may seek to steal or transfer all the funds into mule accounts. In most of the cases, the main intention of cybercrime is harming financial institution image and thereby they block the servers of the firm so that the clients are denied accessing their accounts.<sup>46</sup>

As a number of vulnerabilities permeate within a number of firms defense systems, there is a need to determine the methods of improving awareness over the techniques which can be adopted in combating cybercrimes across the globe. However, not majority of the empirical studies in the past have been carried out in this area which may recommend ways of mitigating the potential risks as well as combating such.<sup>47</sup> In order to understand cybercrimes within the 21<sup>st</sup> century we shall have to describe and understand the defenders and attackers in this kind of environment.

A number of industries across the globe are undergoing a difficult situation which is believed to be provoking as a result of the global and geopolitical macro-economic

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<sup>46</sup> Hutchinson, D., & Warren, M. (2003). Security for internet banking: a framework. *Logistics Information Management*, 16(1): 64-73.

<sup>47</sup> Florêncio, D., & Herley, C.(2011). *Where Do All The Attacks Go? Economics of Information Security and Privacy III* pp. 13-33. Springer New York

conditions. The firms are forced to evaluate its practices currently in order to analyze and manage effectively the risks. Technology driven approaches have been utilized for the risk management purpose. Lakshmi and Ishwarya<sup>48</sup> noted that as a result of IT growth, mobile networks penetration daily, the financial services have been significantly extended to the masses. Technology has made sure that key services reach the extended community as it made these services to be accessible and affordable. However, this subsequently has heightened the risk of becoming cyber-crime targets.

Cybercriminals have formed an advanced technique to cause not only financial theft as well as any financial information but also to business espionage and access of important information of the business which impacts indirectly the finances of the business enterprises. Across the globe, USD 114 Billion is daily lost as a result of cybercrimes activities and the cost implications which is spend on combating cybercrime is a double amount for instance USD 274 billion.<sup>49</sup> On an average, ecommerce facilities normally take upto ten days to recover fully their operations from the acts which increase as well the cost of operation. Drawing comparison to the financial institutions' losses, it is surpassing to 3.5% of the cash loss when compared to the loss globally. \$4 billion goes into losses in terms of recovering from cybercrime and close to \$ 3.6 billion is incurred to combat such crimes from occurring in the future.<sup>50</sup>

In order to eradicate these cybercrimes, the industries need to coordinate with the

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<sup>48</sup> Lakshmi P. and Ishwarya M. (2015), *Cyber Crime: Prevention & Detection*," International Journal of Advanced Research in Computer and Communication Engineering, vol. Vol. 4(3).

<sup>49</sup> Symantec Cyber Crime Report, 2012 [Online] Cybercrime Report. Availableat: [http://now-static.norton.com/now/en/ptu/images/Promotions/2012/cybercrimeReport/2012\\_Norton\\_Cybercrime\\_Report\\_Master\\_Final\\_050912](http://now-static.norton.com/now/en/ptu/images/Promotions/2012/cybercrimeReport/2012_Norton_Cybercrime_Report_Master_Final_050912).

<sup>50</sup> Ibid



global agencies and watchdog agencies so that a model can be formed which can assist in dealing and controlling with such eminent threats. The key issue of concern here is that there is the absence of reliable service of compilation in the industries which may identify the trends within the cybercrime and compile a model based on it. Stafford<sup>51</sup> noted however that in the last couple of years; financial institutions across the globe have perceived cybercrimes as being the top among the potential risks. In conclusion, majority of the systems are a step behind the adopted by the cybercriminals which has led to the demand for system development which is flexible is destroying and meeting the assaults incoming. A solid system of defense to resolve the attacks is the requirement of the hour before after and during the attack.

### **2.2.1 Types of Cybercrimes**

The various computer users will results to the criminal statutes. When a computer is the offense target, the goal of the criminal is to steal information from or cause damage to the computer, computer network or computer system. Hacking , espionage, cracking , malicious computer viruses and cyber warfare are the common forms of crimes which are targeting the computer. The perpetrators could be the teenage, terrorists, professionals or students. The computer may as well be a tool of the offense. The cyber offenders may use the computer to commit a traditional crime such as to print the illegitimate currencies using of advanced colored printers.<sup>52</sup>

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<sup>51</sup> Stafford P. (2013) [Online] Cybercrime threatens global financial system. Available at: <http://www.ft.com/cms/s/0/9804988c-3722-11e3-9603-00144feab7de.html#axzz2tMwSTsmF>.

<sup>52</sup> Otieno, E. O., & Kahonge, A. M. (2014). Adoption of Mobile Payments in Kenyan Businesses: A case study of Small and Medium Enterprises (SME) in Kenya. *International Journal of Computer Applications*, 107(7).

Computers can as well be incidental to the offense but are nevertheless be important since they contain the evidence of a crime. For instance, child pornographer computers may contain the possessed, produced, received or distributed pornography child. Launderers of money may utilize a computer to store details of their operation laundering instead of depending on the paper accounting records.<sup>53</sup> Denial of Service (“DoS”) refers to an intrusion or attack designed for utilization against the computers linked to the internet whereby a single user can deny service to other users who are legitimate simply by flooding the site with so much traffic that no other traffic which no other traffic can get out.<sup>54</sup>

Cyber stalking is when an individual is adhered to and pursued online. It is an harassment form and can led to disruption of the life of the victim and leave them having the feeling of being threatened or afraid. Most people especially the women have been victims of cyber stalking.<sup>55</sup> Sometimes these challenges (stalking & harassment) can happen over the internet. Although it rarely occurs, cyber stalking occasionally happens. Cyber stalking occurs normally with women, who are stalked with men, or children who are stalked by paedophiles and predators.<sup>56</sup> A cyber stalker does not have to leave his home to find, or target harassment and has no fear of physical violence since he holds the opinion that he cannot be touched physically within the cyberspace.<sup>57</sup>

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<sup>53</sup> Stafford P. (2013) [Online] Cybercrime threatens global financial system. Available at: <http://www.ft.com/cms/s/0/9804988c-3722-11e3-9603-00144feab7de.html#axzz2tMwSTsmF>.

<sup>54</sup> Zuppo, C. M. (2012). Defining ICT in a boundary less world: The development of a working hierarchy. *International Journal of Managing Information Technology*, 4(3), 13.

<sup>55</sup> Otieno, E. O., & Kahonge, A. M. (2014). Adoption of Mobile Payments in Kenyan Businesses: A case study of Small and Medium Enterprises (SME) in Kenya. *International Journal of Computer Applications*, 107(7).

<sup>56</sup> Siddique, I., & Rehman, S. (2011). Impact of Electronic Crime in Indian Banking Sector-An Overview. *International Journal of Business & Information Technology*, 1(2).

<sup>57</sup> Zuppo, C. M. (2012). Defining ICT in a boundary less world: The development of a working hierarchy. *International Journal of Managing Information Technology*, 4(3), 13.

Malware is also a common cybercrime threat within the e-commerce. Malware means malicious software which finds their way to a computer system particularly from the internet.<sup>58</sup> They might be worms, viruses and Trojans and other software which get installed in a digital system without the knowledge of the user. In various cases, the software will actually pretend to be software which is legitimate. Intentions of malware are diverse are ranging from spying over your work, sniffing password or phishing , denial of service and monitoring of the websites visited among others.<sup>59</sup> Cybercrimes acquire confidential and personal data belonging to an institution or someone they are targeting. This information can be acquired through email phishing, social engineering, purchasing of data on the black market, using of techniques and tools to search.

Otieno & Kahonge<sup>60</sup> noted that majority of personal data is the open access within the internet particularly in the current era of socializing sites. An attacker may befriend an individual who is not suspicious and acquire all the data they require to lay an attack or entice them on performing some function. Identity theft basically becomes successful when a cybercriminal acquires a person's personal identification information. The crime is triggered by the financial reward likeliness or corruption conducted on the data accessed. Hence, identity theft is an online e-commerce transaction fraud within the telecommunication industry.

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<sup>58</sup> Otieno, E. O., & Kahonge, A. M. (2014). Adoption of Mobile Payments in Kenyan Businesses: A case study of Small and Medium Enterprises (SME) in Kenya. *International Journal of Computer Applications*, 107(7).

<sup>59</sup> Ibid

<sup>60</sup> Otieno, E. O., & Kahonge, A. M. (2014). Adoption of Mobile Payments in Kenyan Businesses: A case study of Small and Medium Enterprises (SME) in Kenya. *International Journal of Computer Applications*, 107(7).

The last type of cybercrime is ransomware. Ransomware built from two words which ransom and malware. It is a kind of malware attack which demands for payment in exchange of stolen functionality of a computer. Majority of the attacks of this nature make use of encryption as the mode of extortion. Normally, the files encrypted on the hard drive of a computer and then asking for financial favors to decrypt them back for the victim to have them back as well. It's a form of denial of service.

### **2.2.2 Cybercrimes Effects**

Siddique & Rehman<sup>61</sup> conducted a study on the effect of electronic crime within the financial in India. The main concern of the study was to determine and also to come up with a conceptual layout on how criminal activities being carried out on online are affecting the financial and the banking sector in India. According to their study findings, the main aim of the financial sector within India is to eradicate all the electronic crime possibilities. This process entails marking the costs necessary which requires to be incurred to affirm a transaction which is secure.

Further, Siddique & Rehman<sup>62</sup> noted that various criminal acts and social disorders occur through the connections of the network which includes activities such as credit card fraud, money laundering and ATM fraud. This research identified one of the costs and fears which the financial institutions anticipate that is the fact which these acts may promote loosing of the trusts of the customers hence losing great business prospects since some may opt for other financial institutions.

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<sup>61</sup> Siddique, I., & Rehman, S. (2011). Impact of Electronic Crime in Indian Banking Sector-An Overview. *International Journal of Business & Information Technology*, 1(2).

<sup>62</sup> Ibid

Subsequently, Hannan & Blundell<sup>63</sup> conducted a study relating to electronic crime and how it's not the only idea to lay jitters on. Their research concentrated on two case studies, one of the researches was to carry out an analysis of the significance and the vital factors affecting the electronic criminal acts breakdown within Australia. The other part of the study tried to furnish the costs that are incurred under the banks legal environment. The study noted that there are diverse costs and consequences that the financial institutions face from the inadequate implementation of the security measures and legal requirements. The study offered a number of solutions and options needed in handling the policy strategies for the future development.

Reynolds et al. <sup>64</sup> concentrated on the effects of cybercrimes within the financial institutions. The main aim of their study was to deliberate on issues of cybercrime within the banking sector. The research did an in-depth analysis over the criminal acts and scenarios across the networks and identified the involved actors in every scenario. The study also documented and identified the various types of criminal acts which are plaguing the financial sector and the motives behind those who engage in such offenses. This study established that among the costs originating from such vice is the financial losses which marks a huge and direct cost issue regionally hindering the systems development.

Moore, Clayton & Anderson<sup>65</sup> conducted a study on the economics of online crime.

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<sup>63</sup> Hannan, M., & Blundell, B. (2014). Electronic Crime-it's not only the big end of town that should be worried. In *Australian Computer, Network & Information Forensics Conference* (pp. 94-102).

<sup>64</sup> Reynolds, D., Treharne, D., & Tripp, H. (2003). ICT—the hopes and the reality. *British journal of educational technology*, 34(2), 151-167.

<sup>65</sup> Moore, T., Clayton, R., & Anderson, R. (2009). The economics of online crime. *The Journal of Economic Perspectives*, 23(3), 3-20.

According to their research, cybercrimes across the e-commerce sectors took place as a result of a number of hackers who are considered to be a nuisance and idle. The study identifies that the financial institutions undergo a lot of challenges trying to regulate their vulnerability to operational risks emerging from connections of network. Their research established that there are paramount improvements and techniques which are viable in handling of online fraudulent activities. Reynolds et al.<sup>66</sup> additionally noted that the agencies should be willing to incur the costs of security for this to acquire effect and secondly the study recommended that in order to address cybercrimes the financial institutions must understand first the economic approach. The indirect loss is the equivalent monetary of the opportunity and losses costs imposed on the society by the fact that a particular cybercrime is conducted, no matter whether successful or not and self reliant of a particular scenario of that particular cybercrime.

Costs which are indirect cannot be linked wholesomely to the individual victims. The general idea of differentiating criminal centre of profit under the common infrastructure

being utilized in the crimes is to prevent allocating the collateral damage caused by the infrastructure to the real forms of cybercrimes, where they might basically show up as the losses indirectly.<sup>67</sup> Since the way (for instance botnets) would not be around if there were no ends (for instance victims of phishing), we consider the caused losses by the infrastructure of cybercriminal as indirect by the nature; oblivious as to whether or not the

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<sup>66</sup> Reynolds, D., Treharne, D., & Tripp, H. (2003). ICT—the hopes and the reality. *British journal of educational technology*, 34(2), 151-167.

<sup>67</sup> Stiroh, K. J. (2002). Are ICT spillovers driving the New Economy? *Review of Income and Wealth*, 48(1), 33-57.

law criminalizes formerly the means.<sup>68</sup>

Examples of the indirect losses may entail: reduction in e-commerce transaction fees, losing of trust in e-commerce transactions and the high maintenance cost of the branch cheques, facilities used for clearing and staff; missed business opportunity for the financial institutions to engage their customers through emails; citizens uptake on electronic services reduction as a result of reduction in trust on online transactions. The direct losses examples entails; withdrawn money from the accounts of the victim; effort and time to reset the credentials of the accounts (for the telecommunication firm and the consumers); suffered distress by the victims; accounts overdrawn secondary costs: deferring of purchases, not having money access inconvenience when needed; attention lost and bandwidth triggered by the emails of spam, even if they are not actually being responded to.<sup>69</sup>

### **2.3 Globalization Concept**

According to Baylis, globalization has been shaping security affairs and international politics in the 21st century. Accordingly, it is regarded as maker of international relations within global phenomenon by many policy makers and scholars. This however complicates the security subject when contemporary issues are combined with the non-contemporary ones. The complexity arises from concerns related to non-contemporary issues particular those impacting national security and it pose challenges to formulation of defense policies at national and global level.<sup>70</sup>

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<sup>68</sup> Muthukumaran. B (2008). Cyber Crime Scenario in India, Criminal Investigation Department Review, pp.17-23

<sup>69</sup> Lewis, J., & Baker, S. (2013). The economic impact of cybercrime and cyber espionage. *Center for Strategic and International Studies, Washington, DC*, 103-117.

<sup>70</sup> Baylis, John, 2001. "International and Global Security in the Post-Cold War era". Globalization of World Politics: Introduction to International Relations. London: Oxford University Press.

Normally, there is need to strike a balance between human and national security. Globalization is boundless; as such, in some instances it has played major roles in enhancing relationships between states thereby reducing potential conflicts.<sup>71</sup> Nonetheless, it may also jeopardize security by intensifying tension between different parties because it closes some gaps and enables events whether good or bad to occur within a narrow space. This expands the scope of national security and threat for all parties involved in globalization. For all people, security enhances the freedom to pursue personal interests without any form of uncertainty or interference. However, insecurity, threatens that freedom by weakening security. Globalization in this respect weakens security and in a way denies people the opportunity to pursue personal interests freely.

There is no doubt that technology is advancing at high rate right now. As a result, trade at global level is increasing as well due to free flow of information and capital goods. As a result of this, there is high level of interdependence both locally and internationally thanks to information technology. All these developments promote economic development, peace and political development. However, they pose serious challenges due to social fragmentation that expose people to conflicts and violence. Because of this economic crises extend beyond state borders thereby they produce hardships at global level. All of these aspects make up globalization despite the serious security implications they have on it. It would be worthwhile noting that the spread of knowledge, movement of people and spread of advanced technologies has increased threats at global level.<sup>72</sup>

Because of intense level of globalization most of threats have expanded to global

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<sup>71</sup> Davis, Lynn E, 2003. Globalization's Security Implications. Issue paper, Rand. California.

<sup>72</sup> Robert O. Keohane and Joseph S. Nye, Jr., "Introduction," in Joseph S. Nye and John D. Donahue, editors, *Governance in a Globalizing World*, Washington, D.C.: Brookings Institution Press, 2000



level and even become more serious due to spread of knowledge, movement of people and spread of advanced technologies. This threatens national security because of the interaction they have with each other. In spite of this, most of these complexities within globalization offer opportunities for democracy and economic development,<sup>73</sup> thereby in a way eliminates the threats and their possible causes.

In spite of the above, most of the dangers of globalization manifested themselves during the September 11th terror attack that demonstrated the way Al Qaeda managed to exploit the global financial networks, movement of people and new communication technologies. The responses received from international community were supported by some of globalization effects with a special attention to advanced technologies in information technology. Even if it might be too early to assert definitively that the results of the attack are likely to dampen some of trends within globalizations, it is possible that financial interaction has received more attention than anything else.<sup>74</sup>

Regardless of this development, the possible harms from weapons of mass destruction (WMD) that lay within the hands of terrorists highlight the need for effective preventive strategies. The national strategy issued in December 2002 aimed at combating WMD lay on three pillars. The first pillar focuses its attention on countering the growth of WDM whereas the second one focuses its attention on strengthening nonproliferation of WDM and the third one on managing the consequences of WDM.<sup>75</sup>

The current military measures aimed at defending attacks from missiles; destroying

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<sup>73</sup> Robert Gilpin, *The Challenge of Global Capitalism*, Princeton, N.J.: Princeton University Press, 2000

<sup>74</sup> Merilee S. Grindle, "Ready or Not: The Developing World and Globalization," in Joseph S. Nye and John D. Donahue, editors, *Governance in a Globalizing World*, pp. 184–188.

<sup>75</sup> National Strategy to Combat Weapons of Mass Destruction, December 2002, [www.whitehouse.gov/news/releases/2002/12/WMDStrategy.pdf](http://www.whitehouse.gov/news/releases/2002/12/WMDStrategy.pdf), p. 2

chemical, biological and nuclear attacks from rogue states are indication of the proliferating WDM use. The new developments in technologies are obviously enabling states to develop dangerous weapons.<sup>76</sup> As a result, it is doubtful whether it will be possible develop measures that will be able to thwart the incumbent challenges related to WDM. However, before coming to this conclusion, it would be necessary to evaluate the possibility of ensuring that the people who misuse technologies, materials and knowledge related to WDM do not access them.

## **2.4 Environmental Crimes**

Despite the growing concern relating to consciousness of environmental crimes, when it comes to environmental crime management, it still often fails to attract the attention it deserves from relevant authorities. The simple reason is that it is often perceived as victimless because environmental crimes do not always produce immediate results that harm the victims. The effects might as a result take longer to manifest themselves. Alongside this practice is the fact that most of disruptions that occur within environment do so under the consent of members of communities thereby they appear to be legal.<sup>77</sup> In this respect, the process of determining what falls under environmental crimes is a complex process because it involves striking a balance between communal interests and practices that maintain the sustainability of ecosystems.<sup>78</sup>

In spite of the above, a socio-legal perspective widens the issue of environmental crime to include issues related to violation of administrative and regulatory practices. This

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<sup>76</sup> John Bolton, "Beyond the Axis of Evil: Additional Threats from Weapons of Mass Destruction," Heritage Foundation, Washington, D.C., May 6, 2002.

<sup>77</sup> Carole Gibbs *et al*, notes that one reason might be that environmental studies has largely been left to other disciplines. Carole Gibbs *et al*, (2010) "*Introducing Conservation Criminology: Towards Interdisciplinary Scholarship on Environmental Crimes and Risks*" 50 Brit. J. Criminal. 124-144

<sup>78</sup> Ibid

means that environmental crimes are equated to other crimes that break the law regardless of the motives behind them. The people who advocate for green practices assert that the study of criminal violation is too narrow because harms on environment are most of the time regarded as violation of regulations.<sup>79</sup> This study shows that the environmental crime, is not necessary viewed as a crime, as the laws on environmental crimes are still not clearly defined, as a result then environmental crime management is therefore not given serious consideration. This therefore study helps to support the importance of renewed interest in research studies involving environmental crime management, which will help raise greater awareness.

Within International Police (INTERPOL), intelligence-led policing is developing as a new approach towards environmental crimes. This model helps in collecting, recording, evaluating and researching sensitive information via INTERPOL's exceptional resources. This enables decision makers at national level and within INTERPOL to identify the high-risk people and areas in a proactive manner. Nonetheless, a proactive method in this strategy would involve collecting similar data from all member states so that environmental crimes can be globalized. It is worth noting that Interpol enables policies to cooperate at international level so that they can play critical roles in enforcing international and national laws related to the environment. The body was developed in 1992.<sup>80</sup>

In all protective measures implemented at whatever level, it is vital for environmental laws to be enforced in the right way. Accordingly, regardless of the benefit such practices have to conservationists in west, the reality of this issue need to be evident among communities living next to wildlife. In this respect, the African countries based

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<sup>79</sup> *ibid*

<sup>80</sup>Yingyi Situ and David Emmons (1999)Op cit

along the southern part of the continent have intensified their fights against ivory trade, because of the revenue that wildlife generates in conservation programs.<sup>81</sup> The literature shows in the early days of developing environmental legislation, very little was fined on the people who violated those laws. In USA, this was largely as a result of the civil nature of the laws that was developed in the country; as such, it was not possible to criminalize poachers. Most of practices thereby focused on sanctions that were laid on organizations engaging in such practices. Therefore the US according to Yingyi Situ and David Emmons in spite of the clear legislature there is still a challenge in enforcement of environmental crimes, and this was the main gap.<sup>82</sup>

Apart from the possible consequences that over-criminalization of environmental crimes might result to as indicated earlier on, the current trend poses two main challenges. Firstly, the over-criminalization of these crimes might belittle criminal laws. This is in relation to the fact that every action that affects society negatively is crime, thereby if everything would be criminalized then the law would lose the stigma linked to one being regarded as a criminal. Secondly, much of focus directed towards corporate crime might misplace priorities given to protecting the environment. It would be worth noting that some of the ills that relate to environmental challenges relate to technological constraints and behavior change among consumers of the illegal wildlife products. Accordingly, rather than focusing too much attention on corporate actors who are few, the focus should be directed towards the consumer of illegal products. In addition, it should be directed towards the consumers and farmers who pollute the environment by practicing bad practices in

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<sup>81</sup> Ibid

<sup>82</sup> Ibid

disposing hazardous products. In this respect, it would be necessary to focus much of attention on public education as a way of enforcing the best practices.<sup>83</sup>

Teague found that despite the imposition of the moratorium in some countries in Africa like, Botswana, Namibia, South Africa and Zimbabwe, the people who violated these practices were allowed to sell government owned ivory stocks. These sales took place in the year 2008 and about 108 tons of ivory were sold to Japan and China. This practice raised concerns whether it would rekindle the appetite for African ivory, predominantly by Asian countries like China – hence the upsurge leading environmental crime.<sup>84</sup>

The environmental crimes within forestry sector relate to illegal logging, illegal sale of wood, flora trade, bio prospecting and piracy, illegal grazing, and illegal charcoal burning among other bad practices. Crimes related to wildlife sector relate to illegal trade of wildlife, poaching, illegal grazing and illegal trade of wildlife products. Within tourism sector, crimes relate to destruction of marines, off road driving, aesthetic pollution, waste pollution, and blockage to natural resources especially to local communities. Within water sector, they relate to water pollution, diversion of water bodies, illegal development or encroachment to riparian land and reclamation of wet lands. Within fishing sector, they relate to illegal trade of ornamental fish, illegal fish farming, illegal fishing and trawling and bad fishing practices.<sup>85</sup>

As the above illustration indicates, crimes within wildlife are many to the extent that they overlap each other. They range from illegal trade of wildlife and their products to

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<sup>83</sup> Michael Rusin, Robert C. Anderson & Thomas J. Lareau (1989), *Managing the Environment. A Review of Present Programs and Their Goals and Methods*, DISCUSSION PAPER #57, AM. PETROLEUM INST. 47-8 (Feb. 1989).

<sup>84</sup> Matthew Teague (2010), *Great Migrations: The Lost Herds of Southern Sudan*, NATIONAL GEOGRAPHIC, Accessed April. 2014.

<sup>85</sup> Matthew Teague (2010), *Great Migrations: The Lost Herds of Southern Sudan*, NATIONAL GEOGRAPHIC, Accessed April. 2014.

consumption of wild animals. In this respect, most of crimes within wildlife are connected to criminal activities such as tax evasion, corruption, money-laundering and fake documents used to track and hunt wildlife.<sup>86</sup> It was in recognition of this fact that endangered species were included in the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) in 1973. The trade agreement aims to ensure that endangered species are not eliminated in totality from the environment.

According to CITES focuses on ensuring that the current practices in wildlife do not threaten the survival of wild plants and animals. To ensure that the said resources are protected for future use, CITES promotes sustainable trade practices. Accordingly, it divides the plants and animals in its scope into three categories on the basis of protection needed to protect them. To ensure this happens and even determine the category that each of them falls into, member states to the convention are required to make sure that the species would not be harmed in any way by trade practices. This necessitates for regulation of trade practices in those areas.<sup>87</sup>

## **2.5 Conclusion**

From the above analysis, it is evident that the international community comprehends fairly well the elements of globalization and possible opportunities and threats that emanate from it, so should African states and particularly for this study, Kenya. Governments need to pursue and implement its initiative of security and particularly Cybercrime which is a major security concern linking environmental crimes. The many elements of globalization necessitate a new approach to global concerns, be they security,

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<sup>86</sup>Mathu, EM and Davies, TC (1996). *Geology and the environment in Kenya*. Journal of African Earth Sciences

<sup>87</sup> Ibid

economic and environmental. To exploit the opportunities presented by globalization, developing countries need to promote democratic processes and promote economic growth. This would not only foster better practices, but it would also address some of the challenges that threaten international security. Accordingly, it would be relevant for international processes to be developed in decision making processes.

## **CHAPTER THREE**

### **POLICIES, MEASURES AND INITIATIVES TAKEN TO COMBAT ENVIRONMENTAL CRIMES AT GLOBAL LEVEL AND REGIONAL LEVEL**

#### **3.1 Introduction**

This chapter outlines the international and national legal framework governing wildlife trafficking in the world and Kenya. It also describes the institutional framework involving prosecution of wildlife crimes in Kenya, and discusses the interplay between the current legal as well as institutional framework, and the problem of wildlife trafficking on the ground. The chapter seeks to contribute to the question of whether Kenya's legislative framework adequately addresses the processes of prosecuting poachers and crimes related to wildlife trafficking, and whether the institutional framework involved in these processes in the country are appropriately structured. Based on existing literature, the chapter evaluates the global challenges that face wildlife in terms of the way policies are developed.

#### **3.2 Global Approaches in Combating Environmental Crimes**

In order to enhance coordination at international level, it would be critical to coordinate national intelligence on environmental related crimes more effectively. This would enable local jurisdiction to implement their national practices as well as practices that would be developed at international level. It is too unfortunate that actionable information is normally withheld at national level to spare countries from international embarrassment. In this respect, important information might be sidelined or even sanitized thereby undermine international efforts geared towards fighting illegal practices within wildlife trade. This is in spite of the fact that all state members to MEA are supposed to provide accurate information that would be profitable to all parties. The unfortunate thing



is that the Montreal Protocol developed a formalized process of licensing systems in 1997 about ten years after the control measures were developed.<sup>88</sup>

All factors hold constant, formal Memoranda of Understanding (MOU) might be helpful in facilitating and regularizing enforcement efforts. In the light of this, WCO signed MOUs with CITES in 1996 and Basel in 1999. Similarly, Interpol signed similar MOUs with CITES in 1998 and Basel in 1999. Likewise, Interpol has also developed similar MOUs with sub-groups in areas related to management of hazardous wastes and wildlife crimes. In this respect, there are various mechanisms for reporting issues related to environmental crimes that cross borders.<sup>89</sup>

In line with current practices, enforcement efforts at international level should be directed towards weak points within commodity chains because endangered species need to be protected. This would protect environment from possible damages and even minimize burdens on states that bear the larger burdens environmental crimes. Similarly, capacity building would also be important in this process at international level.

International Police (INTERPOL) identifies environmental crimes related to illegal wildlife trade, smuggle of ozone depleting substances and illegal logging together with illegal fishing as serious problems at international level.<sup>90</sup>

There is no doubt that environmental crimes have substantial effects on all parts of life. They are linked to abuse of human rights, money laundering, conflict, violence, criminal syndicates within international level, corruption, and exploitation of

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<sup>88</sup> *ibid*

<sup>89</sup>Brack D.; Hayman G., (2002) *International Environmental Crime: The Nature and Control of Environmental Black Markets*. Background Paper for RIIA workshop.

<sup>90</sup>Nelson, F., (2009) Reforming wildlife governance in east and Southern Africa: The role of corruption. Chr. Michelsen Institute, U4 Brief 2009:12.

disadvantaged communities among other bad things. Currently, wildlife crimes are presumed to be worth between \$15 and 20 billion; as such, it is ranked fourth among the illegal businesses in the world. Illegal trade associated with logging has been identified as a source of revenue for organized crimes and terrorism worldwide. In addition, it has been established that the routes that used to smuggle wildlife are also used to smuggle people, drugs and weapons. The UNEP approximates that about 14,000 tons of CFCs, which are estimated to be worth USD \$60 million were traded every year up to 2006 among developing countries. Alongside this, e-wastes have been identified as among the fastest growing forms of wastes throughout the world. The unfortunate thing is that about 50 million tons of these wastes are produced every year, but only 10 percent of them are recycled.<sup>91</sup>

A report that was published by UNEP and partners demonstrated that most of ivories that were captured on their way to Asia were an indication of criminal networks involved in that business. This group was active in the business to the extent that it was estimated to have killed about 17,000 elephants in 2011. This was about 40 percent of the elephants in Africa.

The African Biodiversity Network (ABN) is a network of individual people and organizations who seek solutions to problems facing environment in the continent. The body was founded in 1996 as a response to concern that was growing in the continent concerning African biodiversity. Its focus was to strengthen legal instruments in the continent at regional and international level. At the moment, the body has been able to

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<sup>91</sup>Recycling From E-Waste To Resources: *Sustainable Innovation and Technology Transfer Industrial Sector Studies*, July 2009. United Nations Environment Programme & United Nations University. Prashant, N., (2008). "Cash For Laptops Offers 'Green' Solution for Broken or Outdated Computers".

attract 36 partners throughout the continent. Most of these partners come from 12 African countries only implying that other countries need to join the body.<sup>92</sup> Otherwise, the body might not be that effective if some of the partners would not join hand with others.

The African Network for Animal Welfare (ANAW) is another body that focuses much of its attention on treating animals on a humane basis. The organization seeks to ensure that people understand that animals have feelings and emotions; as such, they respond to physiological and psychological changes that occur within the environment. The organization is founded on the notion that constraints on environmental services are likely to subdue that service and its market. It argues that unscrupulous individuals might be tempted to fill gaps between original and resultant markets for personal gains. Accordingly, they would do anything possible to evade charge or even bypass access restrictions. This might be facilitated largely by regulatory failure to address the current challenges that face the environment.<sup>93</sup> This might involve regulations that would be inadequate to ensure that all treaties and laws are observed at all times to ensure that no one contravenes environmental laws. It would be concerned about sealing loopholes so that unscrupulous individuals cannot utilize them to undermine current efforts. The most unfortunate thing is that even when regulation would be adequate, institutional failures would also undermine that effort. Accordingly, it would be critical to ensure that institutions have capacity and resources to implement their duties. Otherwise, they might be unable to execute their mandates effectively.

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<sup>92</sup>CGN, 2013. Forest Police start “Skynet action” to protect wildlife resources. China Government Network (CGN). <[http://www.gov.cn/gzdt/2013-04/25/content\\_2389801.htm](http://www.gov.cn/gzdt/2013-04/25/content_2389801.htm)> (accessed 16.06.14).

<sup>93</sup>Edwards, J., 2014 World Wildlife Fund Uses RFID to Foil Poachers - A real-time tracking and monitoring solution helps protect endangered rhinos and other animals in Namibia. Radio frequency identification (RFID) Journal newsletter. <<https://www.rfidjournal.com/purchase-access?type=Article&id=11673&r=%2Farticles%2Fview%3F11673>> (accessed 17.06.14)

Criminal profiling is critical in the processes of enforcing environmental laws. It in a way involves evaluating the risks involved in compiling records relating to exporters and importers and combining them with actionable enforcement actions and intelligence so that it can be possible to profile contrabands, trafficking procedures and countries of origin. This process is iterative in nature; as such, statistical data obtained from various areas should be analyzed and results provided for evaluation purposes.<sup>94</sup> It is encouraging to note that special enforcement units have so far been able to succeed in the processes of gathering intelligence, pursuing issues related to corruption, prosecuting issues related to multifaceted corporate investigations and conducting market surveillance. A South African based unit for enforcing issues related to endangered species is a good example. Those in the front line should be linked with other parties at an early stage so that they can be effective in their processes of enforcing all types of environmental laws.

The South African unit was founded by officers with vast experience on issues related to crime; as such, they were able to penetrate networks, uncover issues of concern, conduct operations and gather relevant intelligence. Special units are thereby likely to be efficient if they would be run in the right way and link to administrative and legal structures at various levels.<sup>95</sup> Studies show that models that bypass incumbent bureaucratic processes are able to create super ministries within national wildlife service whose broad responsibilities include managing national parks, protecting wildlife and promoting tourism. Feedbacks provided within shortest time possible especially within 24 hours are likely to motivate workers to perform their duties effectively in protecting wildlife.<sup>96</sup>

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<sup>94</sup> Kalema, J. and Beentje, H.J. (2012). *Conservation checklist of the trees of Uganda*. Royal Botanic Gardens, Kew, England.

<sup>95</sup>Kamfor (2006). Environmental audit of Maasai Mara and Mau forest. Narok County Council, Narok.

<sup>96</sup> Ibid

### 3.3 Regional Approaches to Combat Environmental Crime

The First International Environmental Compliance and Enforcement Conference were conducted in Nairobi, Kenya on 6 November 2013. The event brought together INTERPOL and UNEP and it was attended by about 300 participants who included government representatives, players from NGOs, civil societies, international organizations, and officials from law enforcement agencies. The conference generally centered on trend violations within international laws and the impact of those violations on implementation of those laws and sustainable development. Possible solutions to fighting environmental crimes were offered. The future courses of actions taken by relevant bodies were also discussed in the meeting. The members committed to observing international laws in their fights against wildlife harmful practices. In addition, the consequences of harmful practices on environment were also discussed in the conference. It was suggested that some of environmental crimes were related to high levels of corruption, parallel trades that presented themselves in form of criminal activities, distortion of legal market and loss of tax revenue.<sup>97</sup>

In spite of what has been done, it is quite evident that enforcement efforts at international and national levels are inadequate in some way because of the economic losses experienced in the environment. As a result, it would be necessary to develop programs that would focus their attention on enforcing environmental laws. In addition, it would be necessary to look for sufficient resources that would be utilized in that process. Besides, actionable intelligence ought to be gathered and disseminated to relevant authorities tasked with enforcing various laws. Such practices might involve developing

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<sup>97</sup>Kalema, J. and Beentje, H.J. (2012). *Conservation checklist of the trees of Uganda*. Royal Botanic Gardens, Kew, England.

innovative ways of enforcing the laws and ensuring that they are complied with. It would also be important to eliminate loopholes that encourage non-compliance among member parties and relevant bodies.<sup>98</sup>

In spite of the above, an emphasis on enforcement of laws purely might be tempted to ignore the wider contexts of other systems. As a result, an all inclusive approach should also address the demand and supply of wildlife products that shape the illegal market. The law enforcement agencies rarely address themselves to these factors yet they focus much of their attention on their results. Accordingly, it is evident that government officials and enforcement agents devote much of their attention on sharing experiences rather than addressing their efforts towards criminal syndicates that undermine their efforts. Given the ever increasing demand for wildlife products from African countries that encourage poaching practices, it would be necessary to invest and develop new tools that would address this challenge.<sup>99</sup>

### **3.4 Institutional Response on Environmental Crimes in Kenya**

In Kenya, there is no single state institution tasked with the mandate of fighting environmental crimes, but a number of institutions assist in combating various environmental crimes. The state agencies include Kenya Plant Health Inspectorate Service (KEPHIS), the fisheries department, the National Police Service (NPS), the Kenya Forest Service (KFS), the Kenya Wildlife Service (KWS) and the National Environmental Management Authority (NEMA) among other non-governmental organizations. However, to adequately these environmental crimes, these institutions should have an holistic and

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<sup>98</sup> Ibid

<sup>99</sup>Kalema, J. and Beentje, H.J. (2012). *Conservation checklist of the trees of Uganda*. Royal Botanic Gardens, Kew, England.

integrated intelligence network and law enforcers to apprehend and assist in the prosecution of offender. The following thematic subsequent section addresses the analysis on the institutions tasked with managing of environmental crimes in Kenya.

### **3.4.1 Kenya Wildlife Service**

In Kenya, the Wildlife Conservation and Management Act that was amended in 1989 is the main legislation that governs the operations of KWS. The KWS is mandated by the act as a state corporation to manage and conserve wildlife in the country by making sure that relevant regulations and laws are enforced in the right way. In the light of this, a draft bill has been developed over the years that acknowledge that about 60 percent of wildlife in the country live outside the protected areas probably within private and community lands. As a result, issues related to deterring poaching, reducing conflicts between wildlife and human beings, sharing benefits and incentives aimed at protecting wildlife have been addressed over the years even beyond what the law says.<sup>100</sup>

The responsibilities of KWS include protecting the national 56 protected areas, which include 30 national reserves and 26 national parks that conserve ecosystems. The body is also responsible for protecting wildlife outside of protected areas that form about 70 percent of wildlife in the country. It thereby protects wildlife legally by ensuring that wildlife trade is illegal. In spite of this, crimes related to wildlife in the country have continued to evolve over time. Previously it involved poaching rhinos and elephants, which was largely conducted by heavily armed bandits coming all the way from Somalia particularly in pastoral areas considered as protected areas. This forced certain wild animals

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<sup>100</sup>Mathu, EM and Davies, TC (1996). Geology and the environment in Kenya. Journal of African Earth Sciences.

to exit their rangelands and seek refuge within parks. Before the KWS was established in 1989, there was massive poaching in the country. In addition, there was high level of inefficiency within national parks, staff members had low morale to perform their jobs and agencies tasked with conserving wildlife had inadequate tools to perform their duties.<sup>101</sup>

### **3.4.2 The Kenya Forest Service (KFS)**

The Kenya Forest Service (KFS), which has its roots from the Forest Act of 2005, formulates guidelines and policies that are used to manage, conserve and utilize all types of forests within the country. It is thereby responsible for managing all forests in the country on behalf of state government and provisional forests, but with consultation with their owners. This includes protecting forests in line with what the Act provides in terms of building capacity, developing management plans for specific forests, collaborating with various parties in managing and conserving forests and ensuring that biodiversity therein are utilized in the right way. The KFS through the Act is empowered to enforce rules and regulations relating to logging, forest utilization, charcoal burning and land use related to forests.<sup>102</sup>

All the crimes that occur within national forests are recorded in a book known as occurrence book. However, the book contains very little information relating to environmental crimes. In fact, since 2000, when pole fishing was reported in the book as the only crime, no other crime has been reported in it as a crime especially with the central police station. In spite of this, establishing link with police force, which is responsible for

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<sup>101</sup> Ibid

<sup>102</sup> CCK (Communications Commission of Kenya) 2007, Internet Market analysis report commissioned to Netcom Systems, CCK, Nairobi.



enforcing the law within the country, is a good practice in the fight against environmental crimes.<sup>103</sup>

### **3.4.3 National Environmental Management Agency**

The activities of NEMA are overseen by the Environmental Management and Coordination Act of 1999 (EMCA). In addition, they are overseen by sectoral environmental laws that relate to natural resources, water resources, tourism, local government, health industry, fisheries, energy and agriculture.<sup>104</sup> Environmental Management and Coordination Act identifies a variety of offenses relating to hazardous wastes, standards, EIA, inspection, radioactive materials, conservation and restoration orders as well as pollution. Alongside the coordinating role that NEMA plays in environmental related issues, it also enforces environmental laws. However, it has very little work to do in detecting crimes because it does not have manpower to do that work at ground level and most of its regulations are relatively new. Perhaps, with time, its capacity in detecting crime will improve as people become used to it. In spite of this, it has a hotline for reporting environmental related crimes.<sup>105</sup>

### **3.4.4 Kenya Plant Health Inspectorate Service (KEPHIS)**

The Kenya Plant Health Inspectorate Service (KEPHIS) is tasked with protecting various types of plants, certifying seeds, phyto-sanitary services, providing advisory services to farmers and analytical chemistry laboratory in the country. As regards

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<sup>103</sup>P. Andreas, (2000). Contraband capitalism: transnational crime in an era of economic liberalization., paper presented at conference on *International Organized Crime in the Global Century*, p. 4.

<sup>104</sup>Carrabine, E., Lee, M., Plummer, K., South, N., Iganski, P. (2004). *Criminology: a Sociological Introduction*. United Kingdom: Routledge. 142 Eman, K. (2008). Uvod v fenom

<sup>105</sup>Milliken; Shaw, (2012) The South Africa – Viet Nam RhinoHorn Trade Nexus: A deadly combination of institutionalapses, corrupt wildlife industry professionals and Asiancrime syndicates, traffic Report.

environmental issues, the body controls the exportation and importation of plant materials. As such, it has its inspectors at various ports in the country. To ensure that KEPHIS executes its mandates effectively, the law demands all people entering the country to present their plant materials to plant inspectors for inspection. Additionally, it requires those who export such materials to apply for licenses and in the process of doing that specify the varieties, species, quantities and categories of those materials.

Largely, KEPHIS is involved in providing regulatory services that seek to protect the national agricultural sector from pests and diseases from other parts of the world that might be dangerous to the environment, human health and national economy as a whole. The body was founded under the Plant Protection Act, (Cap 324) with a mission of ensuring quality within agricultural produces and inputs so that food security and sustainable development can be promoted.

### **3.5 Multilateral Environmental Agreements (MEAS) and Treaties**

A number of various international conventions have been ratified in Kenya in regard to combating of environmental crimes. Conventions refer to agreements which are binding on countries which are parties to them. The following are some of conventions which Kenya is part of in regard to environmental crimes prevention:

- 1) The Cartagena protocol ratified in the year 2003 and the 1994 convention on biological diversity
- 2) International trade convention in wild fauna and flora endangered species in the year 1978
- 3) The 1997 Lusaka agreement on cooperative operations enforcement aimed at illegitimate trade in wild flora and fauna

- 4) The 1999 convention on the migratory species conservation and 2001 African Eurasian water bird agreement. Additionally, Kenya participates also in exchange of information and joint cooperation with other states in the Western Indian sub-region on dugong and sea turtle conservation.
- 5) The 1990 Ramsar wetlands convention
- 6) The 1992 Africa convention on natural resources and nature conservation
- 7) The 2000 Basel convention on the trans-boundary movement control of disposal of hazardous wastes
- 8) The famous Kyoto Protocol
- 9) The 2006 persistent organic pollutants Stockholm convention

The Cartagena protocol ratified in the year 2003 and the 1994 convention deals with issues of biological diversity, International trade convention of 1978 addresses the issue of in wild fauna and flora endangered species, The 1997 Lusaka agreement plays a critical role on cooperative operations enforcement aimed at illegitimate trade in wild flora and fauna, the 1999 convention on the migratory species conservation and 2001 African Eurasian water bird agreement. Additionally, Kenya participates also in exchange of information and joint cooperation with other states in the Western Indian sub-region on dugong and sea turtle conservation, The 1990 Ramsar which handles wetlands conservation, The 1992 Africa convention on natural resources and nature conservation and the famous Kyoto Protocol on environmental conservation.

### **3.6 Cyber space Technology Response**

There is no doubt that technology has changed the way wildlife trades are

conducted. This includes the sale of apes, exotic birds, pangolin scales, rhino horns and ivory. To a large extent, the internet has eliminated some of the barriers by facilitating communication, exchange of information and reconfiguring links between various parties.<sup>106</sup> Nonetheless, it is rather obvious that technology may also be instrumental to national security organs in their fights against illegal practice in wildlife. As an illustration, a Chinese authority launched a program known as “Skynet Action”, in 2013 that sought to bar wildlife criminal activities that were implemented over the internet. Drones may as well be utilized in the fight against wildlife crimes.<sup>107</sup>

Most technologies used in this process included monolithic sensors that do not need to be attended by anybody to function. The technologies are able to locate suspicious sounds and locate their sources and even send real time information relating to those sounds. Some of these technologies are able to deploy drones to collect vital information relating to those sounds and other important issues using photos, infrared footages.

### **3.6.1 Mobile Technology**

The use of mobile technologies, which are hand-held devices, connected to satellites are only being implemented among the members of the public to help them participate in the processes of fighting illegal poaching and other illegal wildlife practices. For instance, TRAFFIC, which is a network that monitors wildlife trade, was launched recently by a Taronga Conservation Society, Australia.<sup>108</sup> The mobile application

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<sup>106</sup>Lavorgna, A. 2014. Wildlife trafficking in the Internet age. *Crime Science* 3, 5.

<sup>107</sup>UNEP, 2013a. A new eye in the sky: Eco-drones. *Global Environment Alert Service Bulletin*, May 2013. United Nations Environment Programme. <<http://www.unep.org/geas/>> (accessed 16.06.014).

<sup>108</sup>TRAFFIC, 2014. New app to build awareness and information on illegal wildlife trade in South-East Asia. TRAFFIC. <<http://www.traffic.org/home/2014/4/9/new-app-to-build-awareness-and-information-on-illegal-wildli.html>> (accessed 16.06.14).

encourages the members of the public to report suspicious activities they identify in their communities. Similar applications are also on the verge of developing.

In Vietnam, for instance, three mobile phone providers assist in the processes of sending mobile-based messages to over 110 million people as a way of creating awareness among them. This helps in reducing the demand for rhino horns. Similarly, a Spatial Monitoring and Reporting Tool (SMART), which is an open-source software program was innovated to help Asian and African communities to participate in fighting crimes related to wildlife.<sup>109</sup> SMART can be accessed in six different languages and its main focus is on ensuring wildlife laws are enforced in the right way and patrols are made more effective. As a result, the program is able to crunch the data it receives from reports and patrols and present it in more readable form for actions to be taken. A firm known as Monitoring the Illegal Killing of Elephants (MIKE) has been able to use the software so far. The program is managed by CITES and it collects data from over 51 sites in Africa.<sup>110</sup>

### **3.6.2 Cybertracker**

Cybertracker is a similar program that is installed on tablets, hand-held devices, smartphones and computers and which forest rangers use to record information related to human activities within forests, wildlife and vegetations. The program is utilized to notify park managers about possible threats; hence, enabling them to take actions faster to counter poaching activities. In April this year, GRASP, which focuses on protecting apes, supported a similar initiative in Africa by financing a workshop that focused on training government

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<sup>109</sup>SMART, 2014. SMART conservation tools. SMART. <<http://smartconservationtools.org/>> (accessed 16.06.14).

<sup>110</sup>CITES, 2014. Elephants poaching and ivory smuggling figures released today. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). <[http://www.cites.org/eng/elephant\\_poaching\\_and\\_ivory\\_smuggling\\_figures\\_for\\_2013\\_released](http://www.cites.org/eng/elephant_poaching_and_ivory_smuggling_figures_for_2013_released)> (accessed 16.06.14).

officials from DRC Congo, Cameroon and Senegal about the need to protect apes and use CyberTracker. With the assistance of African Wildlife Foundation (AWF), the program was able to assemble managers and park wardens to a remote area in DR Congo and learn about the program. The team learnt how to use the program in a practical condition with difficult conditions to ensure that they would be able to implement those programs in their countries.<sup>111</sup>

### **3.6.3 Mikrokopters**

This is an aerial platform that hover remote regions to obtain relevant information relating to wildlife. It is able to identify positions and collect information using images and calculating distances. Most of these devices have GPS, altitude control systems, telemetry, automatic systems and compasses.<sup>112</sup> Like drones, they are able to be programmed to hover over specific regions or operate manually through control sticks. In addition, they can be equipped with camera systems to collect information. Even though much of anti-poaching effort is directed towards regional or national campaigns, some technologies are designed for individual animals at any given time. For instance, the Radio Frequency Identification (RFID) tags are small devices planted into specific animals to track their movements and ensure that they behave normally all the times. When animals get out of their restricted areas, RFID are able to track their locations and help in bringing them to their designated areas. This helps in rapid response actions especially among rhinos.<sup>113</sup>

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<sup>111</sup> Ibid

<sup>112</sup>HiSystems, 2014. MikroKopters. HiSystems. <<http://www.mikrokoetter.de/en/home>> (accessed 15.06.14).

<sup>113</sup>WWF, 2014. WWF Tech Integration Helps Namibia Tackle Wildlife Crime - Integrated Airborne and Ground-Based Tech Systems Tested in Namibia to Add New Tools to Protect Elephants, Rhinos and Other Wildlife. <<http://www.worldwildlife.org/press-releases/wwf-tech-integration-helps-namibia-tackle-wildlife-crime>> (accessed 17.06.14).

### **3.6.4 Military-Style (Mesh) Digital Networks**

These networks are considered to be digital in nature and they help in transmitting sensitive data on timely basis without being hacked or monitored. The main challenge with mobile-based technologies is that they are accessed by almost everybody. Accordingly, poachers are able to own and access them and even control animals with microchips. However, with Mesh network, it is possible to scramble data upon transmission and decode it upon receiving it. This enables rangers to communicate effectively without poachers intruding into communication processes. It would be important to note that these networks have encryptions even though all encrypted networks are not mesh networks.<sup>114</sup>

### **3.6.5 Camera Traps**

For a long time, these traps minus human interaction have been critically monitoring wildlife at various parks and conservancies. As a result, with advent of advanced technological developments, it has been possible to make use of these cameras in tracing poachers. The most recent models have video feeds, triggers that are automatic as opposed to being timed as it used to happen before, detectors for detecting vibration and infrared detectors, heating systems and acoustic aspects capable of transmitting data on real time basis.<sup>115</sup>

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<sup>114</sup>WWF, 2014. WWF Tech Integration Helps Namibia Tackle Wildlife Crime - Integrated Airborne and Ground-Based Tech Systems Tested in Namibia to Add New Tools to Protect Elephants, Rhinos and Other Wildlife. <<http://www.worldwildlife.org/press-releases/wwf-tech-integration-helps-namibia-tackle-wildlife-crime>> (accessed 17.06.14).

<sup>115</sup>World News, 2014. Tech Targeting Wildlife Poachers. April 2, 2014. World News. <[http://article.wn.com/view/2014/04/02/Tech\\_Targeting\\_Wildlife\\_Poachers\\_Photos\\_WWF\\_World\\_Wildlife\\_F/](http://article.wn.com/view/2014/04/02/Tech_Targeting_Wildlife_Poachers_Photos_WWF_World_Wildlife_F/)> (accessed 16.06.14).



**Figure 2: Poacher caught on camera trap**

### **3.6.6 Radio Collars**

The radio calls that were once cumbersome and short-lived have now been transformed thanks to satellite technology to help in the fight against poachers.<sup>116</sup> They make use of in-built accelerometers to transmit information relating to the health of animals and deviations in their patterns, which suggest presence of poachers. Once animals with these devices meet with collars, they share that data automatically; hence, response measures are taken immediately. Advances in the cost, durability and sizes of these devices, imply that they can be utilized a wide range of animals. This includes the tiny birds, apes and elephants.

Innovators in Nairobi, which is regarded as Africa's Silicon Savannah, are presently

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<sup>116</sup>Kagande, S., and Musarurwa, L., 2014. Conserving the African rhinoceros. *Biodiversity Conservation* 23, 497–502 DOI 10.1007/s10531-013-0613-2.



developing tools for tracking wild animals; and in so doing, fight poaching. One of such effort under Savannah Tracking Ltd enables biologists to track vultures, lions, zebra and elephants using radio collars. The GPS-based collars are harmless to animals; thereby, they are attached together with mobile phones. They help in collecting GPS-based data relating to the location of animals on hourly basis. The mobile phones send data to servers that biologists used to track the movement of those animals. In return, conservationists use the data to ensure that animals are protected all the times as well as generate funding where possible. With such an instrument, it is possible to track poachers and act on real time basis. A mobile phone known as MiSavannah that was developed by Savannah Tracking Ltd., enables the members of the public to track about five wild animals at any given time. The program is available via Google Play for public use.<sup>117</sup> The picture below shows the radio collars which the study noted that it was being used by most of conservations to track wild animal movements

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<sup>117</sup> Ibid



**Source: Savannah Tracking Ltd, 2020**

### **3.6.7 Satellite Imaging**

Alongside the above, high-resolution images obtained from satellites are also utilized to track illegal wildlife practices such as illegal deforestation. In Brazil, for instance, where deforestation has decreased by about 78 percent since 1988, the system has been utilized to track illegal wildlife practices.<sup>118</sup> The system has also been utilized by UNEP under Global Forest Watch to ensure that forest resources are managed effectively. This makes use of open data and satellite technology to facilitate the process of sharing information relating to forests on real time basis.<sup>119</sup> Over the last few years, analysts have been able to

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<sup>118</sup>Nellemann, C., Henriksen, R., Raxter, P., Ash, N., Mrema, E. (Eds). 2014. The Environmental Crime Crisis – Threats to Sustainable Development from Illegal Exploitation and Trade in Wildlife and Forest Resources. A UNEP Rapid Response Assessment. United Nations Environment Programme and GRID-Arendal, Nairobi and Arendal.

<sup>119</sup>WRI, 2014. Global Forest Watch. World Resources Institute (WRI). <<http://www.globalforestwatch.org/>> (accessed 17.06.14).

link illegal logging to illicit trades within wildlife. They have demonstrated that ships that transport contraband wood also transport wildlife illegally. In addition, well cut out roads into thick forests are able to facilitate massive logging, hunting and mining into deep forest without the knowledge of parties concerned with protecting those forests. However, in the presence of satellite imaging such practices have been eliminated.

### **3.7 Conclusion**

This chapter has effectively followed the historical backdrop of land registration in Kenya and distinguished the different difficulties experienced under the use of the different statutes administering land registration and titling in Kenya. The presentation of the Land Registration Act 2012 as the single law to control the registration of title to land in Kenya and to supplant the different statutes like the Land Titles Act Cap 282 beforehand pertinent to the land inside the ten mile Coastal strip and the Registration of Titles Act Cap 281, prior controlling properties studied under exact limits, the Registered Land Act Cap 300 some time ago appropriate to most country properties reviewed under general limits and around couple of urban properties overviewed under the settled limit arrangements of the Act, the Indian Transfer of Property Act 1882 and the Government Lands Act Cap 280, in Kenya has turned out to be as powerful as was examined.

Indeed, even after its presentation the shortcomings recognized under the before administration on registration stay uncertain because of difficulties in the usage of the new law and other specialized components. Registration of title to land in Kenya prior done and Title deeds issued under the previous administration keep on being substantial despite the new laws. The utilization of this law looked to accomplish a uniform land registration framework and issuance of titles under a uniform administration. The following chapter

takes a gander at the Land Registration Act 2012 with the point of looking at its viability in accomplishing its target of reexamining, solidifying and justifying the registration of titles to land, to offer impact to the standards and objects of lapsed government in land registration.

**CHAPTER FOUR**  
**CHALLENGES ENCOUNTERED IN COMBATING ENVIRONMENTAL**  
**CRIMES THROUGH CYBER SPACE TECHNOLOGIES**

**4.1 Introduction**

The fourth chapter sought to address the challenges encountered in combating of environmental crimes through the adoption of cyber space technologies. A number of challenges have been identified in the study with possible panacea for the challenges being recommended in chapter five. The challenges range from structural, political, communal, enforcement and economic which the study believes that has greatly bedeviled the attempts being made to combat environmental crimes.

**4.2 Challenges Encountered In Combating Environmental Crimes**

At the time most of states developed a number environmental laws, pollution activities propagated by criminal groups were never envisioned. From a victim's viewpoint, the person involved in polluting a river does not matter whether it is an individual or a group of people. All that matters to these people is the pollution that affects their health. In contrast to this, some people in criminology argue that the dangerous environmental risks emanate from social practices. For instance, the current lawful acts of using old oil tankers cause a lot of risks when viewed from ecological viewpoints. Probably, with more awareness, this would reform the current lawful practices. Nonetheless, such a debate would raise more concerns from various quarters.

In the light of the above, there would be the need for systems in criminal justice to function with some level of certainty so that they can be consistent. From such a viewpoint, the question would turn to suitability of environmental harms within existing laws. The

Kenya Forest Service's faces challenges various in environmental crime management including, Participatory Forest Management (PFM). As a result, it would be critical to clarify the existing guidelines so that practices within management of environmental resources can be successful. In so doing, it would be critical to clarify issues from regional experiences. This process would be timely because there is need to clarify some of the issues including and even collect data relating to forest plantations. This would be critical in documenting forest areas so that contractual agreements can be developed effectively. The dry lands would also be regulated to minimize charcoal burning activities and promoting efficiency in managing those lands. This would help in promoting incentives that would encourage forestry among private farms and private investors that play an important role in enabling the country to attain the 10% forest cover. Nevertheless, the degree of criminalizing environmental harms would have several implications. It would basically determine the actions that would be taken against the people who would violate existing laws on environment.

The study reveals that most of the benefits that emanate from globalization are normally utilized by criminal activities to execute their crimes. The internet for instance is utilized to execute illicit trade deals relating to wildlife. Results from the UN Office on Drugs and Crime (UNODC) have identified various forms of crimes related to environment in Asia suggesting that most of those groups are involved in smuggling harmful substances, timber trafficking, and smuggling wildlife. The report indicates that the Italian and Colombian governments with the help of INTERPOL developed a report in 2010 on organized crimes within their national boundaries to document such cases within their countries.

Once again, it would be important to remember that environmental crimes might appear in different forms. This might include illegal practices on protected species; unreported fishing, which might be unregulated and illegal, smuggling of ozone depleting substances, illegal logging, and other harmful practices on environment. Most of the time, such crimes do not attract attention from government because they are regarded as victimless. For various countries, the process of combating these crimes is not a priority to them thereby it is overlooked despite the huge impact it might have on those countries in the future.

In spite of the above, the crimes have considerable effects on societies at large. They harm the environment and they keep on evolving at a regular basis and they are often linked to high levels of corruption and violence. The fact that these activities cross borders is a major factor that has contributed to the publicity that the issue has received over the last few years. To a large extent, the financial gains that emanate from these illegal practices have contributed in the widespread of organized crimes and illicit criminal activities that extend beyond national boundaries. Research has established that most of these activities are related in one way or the other to other serious offenses such as human and drug trafficking, money laundering, firearm smuggling, counterfeiting, corruption and fraud among others. In this respect, environmental crimes form part of emerging trends within transnational organized crimes implying that preventive actions need to be coordinated across borders.

The study revealed that even in the presence of high levels of corruption some rules need to be developed to counter challenges related to environmental crimes. Nevertheless, enforcement is an important element in controlling the flow of illegal rents. It should be

noted that some of corruption that ensues within these crimes emanate from externalities within environmental regimes. Nonetheless, in the absence of compelling evidence it would not be possible to link everything within organized crimes seen in this area.<sup>120</sup>

### **4.3 Conclusion**

This study has shown in this chapter that environmental crimes have significant implications on the human health and environment, on the economy, safety and security within a country as well as revenues of the government, including through the funding of terrorism activities and non-state armed group. These effects change the communities or individual well-being, entire nation or companies, including through compromising of sustainable development and undermining of legal business through unhealthy competition. The study has shown that these variables inform the types of response by respective authorities charged with enforcement and the possible aims. The study has shown that a number of institutional, legal, technical, human, knowledge and financial constrains hinders the environmental laws and conventions enforcements.

Moreover, the study has asserted in this chapter that environmental crime is a sporadically evolving subject which requires greater global recognition in regard to terms of its impacts and scope. Indeed, such recognition depends strongly on national priorities and contexts. Environmental crimes are covered by different policies and laws, both at the international level and national levels in given states. Through various content and thematic analyses, the study has shown that sanctioning, prosecuting, enforcing and environmental crimes through cyber space technology need specialized technical and legal expertise as

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<sup>120</sup>Pimm, S., Jenkins, C., Abell, R., Brooks, T., Gittleman, J., Joppa, L., Raven, P., Roberts, C., Sexton, J., 2014. The biodiversity of species and their rates of extinction, distribution, and protection. *Science* 344, 987-997.



well as constant building of capacity. Additionally, the environmental laws implementation falls within the various authorities such as KFS and KWS competence and entails often the private actors' involvement. Environmental law and its implementation hence need formidable cooperation at international and national levels as well as constant adaptation.

## CHAPTER FIVE

### SUMMARY AND CONCLUSION

#### 5.1 Introduction

This chapter presents summary of the research as well as conclusions drawn from the same.

#### 5.2 Summary of the Findings

The study set out to establish the effectiveness of environmental crime in Kenya. This section presents data analysis and interpretations of the findings from the data collected to determine environmental crime management in Africa with a special focus on Kenya. Data was analyzed qualitatively and quantitatively in order to establish the objectives under study. Primary data was collected using interview administered questionnaires to key stakeholders involved in environmental crime management, who were the main target population. The data was then analyzed using descriptive statistics analysis (so as to give a statistical perspective) and document analysis (so as to give documented proof, critical review and comparative analysis of the topic) and thematic analysis.

Regarding the factors affecting environmental crime management in Kenya, the study revealed that proper legislation and effective enforcement of environmental laws affects environmental crime management as they are very critical in protecting the environment – especially the fact that there is still no clear description of environmental crimes in different countries that has led to differing use of the term. This contributes to looming confusion in management and criminal activities related to environmental issues. Another factor that affects it is the lack of harmonization of the laws governing environmental crime management in Kenya and combined with the contradiction between the wish for clean environment and technological development. In trying to investigate the

causes of environmental crime in Kenya, which will assist in environmental crime management, the study found poverty as a major cause of environmental crime. Evidence suggests that in certain areas, populations and environments are more vulnerable to the causes of environmental crime.

#### **5.4 Conclusion**

The study reveals that despite the growing awareness of environmental crimes, the issue of managing environmental crimes fails to inspire the desired response from people, communities that enforce the law and governments because it is viewed as victimless. This is because most of the time the issues related to environmental crimes might go unnoticed. The study therefore concludes that the challenge of environmental crime management in Kenya is serious. There is no clear legislation, strong environmental laws, and remuneration among the people tasked with enforcing those laws. It is even worsened by weaker civil society and multinational companies that invest in the country that benefit in one way or the other from those activities.

In spite of the above, the use of enhanced technologies in the fight against illegal wildlife offers hope and it will continue to do so and play an important role in wildlife conservation. Nonetheless, there would be the need to invest more in these technologies especially from the government, law enforcement agencies and wildlife. The new technologies offer opportunities for various parties to collaborate with each other in the fight against those crimes. Additionally, there will be the need for new laws to be developed to ensure that law enforcement agencies will be able to use the new technologies effectively. Accordingly, there will be need for more metal detectors, new mobile phone applications and toy airplanes to address some of the new challenges.

The study also concludes that, even though the new technologies used in the fight against illegal wildlife trade may not substitute the conventional measures of anti-poaching, some of those technologies will not be applicable to low capacity environments because of little expertise in those areas. In this respect, a solution that will be long-term will need to address the supply part of the wildlife resources so that it can reduce demand for those resources. Accordingly, it will be important to use measures that will deter wildlife trade by encouraging a culture of transparency, behavioral change, alternative methods of earning livelihoods and legal enforcement. This means that it will be important to use broad-based collective actions that should include harmonizing and strengthening environmental laws and acquire greater support from relevant stakeholders. Additionally, it would be necessary to use empirical evidence to understand what needs to be done to improve the current practices in the fight against illegal wildlife trade.

### **5.5 Recommendations**

The study made the following recommendations;

Overall, it is evident that core resources that include mobile phones, patrol vehicles, radios, computers and internet connectivity are vital in the fight against illegal wildlife trade and responding to challenge that emanate from these activities. The people who participated in the study acknowledged that some of these resources were provided to them, but they highlighted the need for more resources such as surveillance drones, detector dogs, GPS software and metal detectors. Surveillance drones on their part could provide innovative ways of countering challenges related to monitoring processes and protecting wildlife by gathering intelligence. Other technologies such as thermal infrared sensors, seismic ground sensors, heartbeat monitors, and satellite imagery are also becoming

important tools in the fight against illegal practices within wildlife. As such, it would be important to use these tools to improve the current measures that need to be strengthened.

The process of formulating environmental crime laws should be all inclusive with wide consultation among stakeholders' especially local communities. This will ensure ownership by the local and hence will play a key role in the management of environmental crimes. This way, environmental crime management in the country will be highly enhanced. The study encourages strengthening of environmental crime management policies. At the moment environmental crime and environmental crime management is still a loose concept with weak policy. As a result, there is need to review the existing policies within environmental practices with a view to achieve the following: enhance and enforce laws that would protect the environment; integrate environment within sectorized markets and policies; review the tax practices within ecological areas; eliminate unfair subsidies with a view to soften externalities within the environment; introduce accountability within environmental practices; improve awareness among the members of the public and implement new practices in management of information related to wildlife.

Environmental crime management should be highly prioritized by the government as effective environmental crime management is vital in the process of realizing Kenya's Vision 2030. This is because most of these practices will impact human security, the way people live and earn their living. In this respect, environmental crimes should be tackled by developing laws and policies that would benefit local people from their own resources rather than deny them the opportunity to make better use of those resources. This would be critical in the fight against illegal practices within wildlife because they will have a responsibility in protecting them. In this respect, it will be critical to improve capacity

building within wildlife practices by promoting intense training among agencies that enforce laws and protect wildlife. This would be critical in harmonizing environmental laws and practices within wildlife. At this point, it would be important to note that lack of capacity building within this area would weaken the fight against illegal practices because those involved would not be able to prosecute poachers and take initiatives needed to improve the current practices. As a result, it would be necessary for various agencies and parties to collaborate with each other and create opportunities for improvement.

In addition, it would be critical to understand that the black market within this area is dependent largely on discrepancy between the demand and supply of wildlife resources, the inconsistencies within the controllers of wildlife practices and the methods used in exchange of goods within the international market. The study identified the need to control most of these things so that there can be uniformity in addressing the challenges emanating from harmful practices within environmental practices. The study demonstrated that the enforcement of the existing laws may be insufficient especially to ensure that poachers do not engage in the harmful practices of poaching wildlife. Because most of the victims in environmental related crimes are not human beings, then it becomes most of the time hard to prosecute poachers and even prosecute cases related to poaching especially when there are no complainants. Accordingly, states bear the burden of prosecuting poachers and even enforcing laws, which sometimes prove hard to them. The literature thereby suggests that environmental treaties should be comprehensive to enable policy makers comply with international practices.

Finally, this study recommends the adoption forensic science by authorities tasked with environmental crimes management. Forensic science may also play a fundamental

role in evidence gathering and identification of illegal materials; for this to be actually the case, it is paramount to treat scenes of environmental crimes much as other scenes of crime and allow for a detailed investigation. DNA fingerprinting and more traditional skills such as morphological biology and anatomic have proved to be paramount in identifying contraband such as toothfish fillets and shahtoosh from look-alike products. The test kits for DNA may also be made available to the operatives of enforcement to assist in simple point-of –contract test. Transponders, radio frequency identification (RF/ID) tags, barcodes, chemical tracers as well as Microtaggant.

Some of these techniques of tracking, particularly transponder tracing or UV-dye, have also been utilized in tracking of contraband in covert operations and detecting where such materials are actually laundered into legal commercial activities. Conversely, oblivious of the great potential of modern technology, systems will only be innovated if the policy needs over their utilization is well defined. The fact that central registry and barcoding are used routinely to track merchandise sale in high end street corners, its use internationally for items of high value such as tropical logs should not be regarded so often. The mere that technological developments precede currently policy rather than being guided by it offers some signs of uncoordinated international perspective as well as international centers of excellence in coming up with new methodologies of enforcement and environmental forensics need to be formed to aid in this process.

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**APPENDIX I: INTERVIEW GUIDE**

**Introduction**

My name is Arnest Agina a Master’s student at the University of Nairobi under the Institute of Diplomacy and International studies (IDIS) undertaking Masters of Arts in International Conflict Management . This interview schedule is meant to collect research data. The title of the study involves *‘cyberspace technology in combating of environmental crimes in Kenya’*. You have been selected as one of the respondents in my study I would be grateful if you provide with the answers to my research questions. If I need to use the information for any other purpose, it shall be done with your consent. Kindly tick or mark where appropriate in the spaces provided in this interview schedule

1. Are you aware of the modern technologies being used in addressing environmental crime issues in Kenya? If YES briefly explain?

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2. Have you ever dealt with any environmental crime case? If yes what was the type of environmental crime?

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.....  
.....

3. Why do you think people engage in environmental crimes in Kenya?

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4. Do you think that the agencies tasked with environmental crimes management are

effective?

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5. What are some of the agencies dealing with environmental crimes that you are aware of?

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6. In regard to question (5) kindly cite the mandate of the agencies mentioned above?

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7. If your answer was YES in relation to question (2) , were you able to successfully investigate the case and seek for prosecution?

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8 What are some of the challenges facing environmental crimes management agencies in the country?

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9. To what extent do the challenges mentioned in question (8) above affect combating of

environmental crimes management in the country?

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10. Do you think that the community is doing enough to safeguard against environmental crimes?

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11. Do you think that new technologies being used by state agencies and NGOs are effective in environmental crimes management?

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12. What alternative approaches apart from cyber space technology adoption do you think can be utilized in combating environmental crimes in Kenya?

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**Thank you for your time**