

**THE LEGAL REGULATION OF PORT WASTE MANAGEMENT IN THE UNITED
KINGDOM AND NIGERIA: COMPARATIVE ANALYSIS OF SOUTHAMPTON
PORT IN THE UK AND APAPA PORT IN NIGERIA**

OLUWATOSIN SUNDAY OSALONI

Submitted in accordance with the requirements for the
Degree of Doctor of Philosophy (PhD)

The University of Central Lancashire

March 2019.

Abstract

This research centres on the legal regulation of port waste management in the UK and Nigeria: comparative analysis of Southampton port and Apapa Lagos port. The research focused on ship-generated waste, and operational discharge of waste from ship at the port. Thus, waste generation within the port environment occurs due to shipping and multifarious activities at the port. It is therefore important, that waste generation is properly regulated due to pivotal role port plays in economic development via export and import of goods into a country. Hence, such economic development could be hindered, if waste legislation is not adequately implemented or effectively managed. Therefore, measures must be taken nationally and internationally to control port waste generation with a view to protecting port from negative effect of ineffective port waste management. This research, therefore, addresses the problems of waste and the effective legal framework for solving waste glitches as well as the machinery for its enforcement.

This research used interview, to examine the view of various stakeholders on port waste management, compliance with its legal framework and the role of such legal regulations for effective port waste management. Furthermore, the research also recognised a direct link between adequate port waste reception facilities, port decongestion, secure and safety of the port environment, which perhaps form the nucleus of waste management. The research therefore, aims to establish that effective and efficient port waste management is a strong panacea in oiling the wheel of port waste free. It therefore recommends that both the UK and Nigeria government and its relevant agencies should make concerted efforts to ensure efficient and effective implementation of legal regulations of port waste management at all level at the port with a view to securing port from ineffective waste management.

Acknowledgement

My research journey was made possible by the kind providence of Almighty God and the kind-heartedness of those He sent across my ways; for this, I am most grateful. First, I will like to register my profound appreciation to my supervisory team, headed by Professor Keyuan Zou, Professor Michael Salter and Dr Bogusia Puchalska. I thank Professor Keyuan for his comments on different drafts of the thesis. Professor Michael is appreciated for his comments and firmness. Dr Bogusia gave me all the necessary support required to finish the programme.

Special thanks to my parents, Chief Michael Ajayi Osaloni, and Mrs Veronica Osaloni for their munificence to sponsor my PhD programme. Thanks for your constant prayers, parental care, and support. I also appreciate the love and care from my siblings during the programme, Olubunmi Amusa (Nee Osaloni), Akinlolu Osaloni, Ronke Osaloni, and Yetunde Owolabi (Nee Osaloni). I celebrate Mr Olumuyiwa Owolabi and Dr. Amusa for their supports and encouragement. I thank Chief SPA Ajibade, Mr Dele Ajibade and Dr Babatude Ajibade SAN for their moral supports.

I have received a lot of support from my leaders in the Christian Faith, Pastor Kolawle Mayomi, Pastor Dr. Morakinyo Olumodimu, Pastors Odunayo and Kayode Olubiyi am very grateful for all your prayers and supports. I equally appreciate Pastor Nike Olugbenro and sister Bunmi odeleye-imiere for their kind support.

I want to appreciate my friends amongst who are; Babasola Daramala, Bolaji Wahab, Temitayo Oyediran, Dr Adejoke Ige, David Olajide and Peter Imosi. I am grateful for all the supports you all rendered during this programme.

Finally, I thank God for the gift of Dr Sarah Osaloni, my lovely wife whose presence, prayers, understanding and companionship made this writing possible. My success is your success, with you; life is a dance every day.

List of Abbreviations

ABP	Associated British Ports
ABPmer	ABP Marine Environmental Research
ACL	African Circle Limited
ACPML	African Circle Pollution Management Limited
BAT	Best Available Techniques
BEP	Best Environmental Practice
BMIF	British Marine Industries Federation
BOD	biochemical oxygen demand
BOT	build, operate and transfer
BPA	British Ports Association
CCTV	closed-circuit television
CSR	corporate social responsibility
EA	Environment Agency
EC	European Commission
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EIS	environmental impact statement
EMP	Environmental Management Plan
EPI	environmental performance indicator
ESPO	Europe Sea Ports Organisation
FEPA	Federal Environmental Protection Agency
GISIS	Global Integrated Shipping Information System

GPA	general performance assessment
GPML	Global Partnership on Marine Litter
GRB	garbage record book
GRT	gross register tonnage
IAEA	International Atomic Energy Agency
ICJ	International Court of Justice
ILO	International Labour Organization
IMO	International Maritime Organization
INTERPOL	International Police Organization
MARPOL 73/78	Marine Pollution (International Convention for the Prevention of Pollution from Ships 1973, modified 1978)
MCA	Maritime and Coastguard Agency
MEPC	Marine Environment Protection Committee
MIDAs	Maritime Industrial Developments Areas
MoU	Memorandum of Understanding
NIMASA	Nigerian Maritime Administration and Safety Agency
NMA	National Maritime Agency
NPA	Nigerian Ports Authority
NSC	Nigerian Shippers Council
OAU	Organisation of African Unity
OECD	Organisation for Economic Cooperation and Development
PCG	Port Coast Guards.
PLA	Port of London Authority
PPP	Polluter Pays principle

PPP	Public-Private Partnership
PRF	Port Reception Facility
PSC	Port State Control
PWMP	Port Waste Management Plan
PWRF	Port Waste Regulation
PWRMT	Port Waste Regulatory Monitoring Team
RSP	Repository Site Procedure
RYA	Royal Yachting Association
UNCED	United Nations Conference on Environment and Development
UNCLOS	United Nations Convention on the Law of the Sea 1982
UNEP	United Nations Environment Programme
UNODC	United Nations Office on Drugs and Crime
WAMASON	Waste Management Society of Nigeria
WCO	World Customs Organization

List of Legislations

- Admiralty Jurisdiction Act, Cap A5 Laws of Federal Republic of Nigeria, 2004.
- Constitution of the Federal Republic of Nigeria 1999.
- Environmental Protection Act 1970.
- Environment Impact Assessment (EIA) Decree No. 86 of December 1992.
- International Convention for the Safety of Life at Sea, done 1980.
- International Convention on Load Lines 1968.
- International Convention on Standards of Training, Certification and Watch keeping for Seafarers 1978.
- National Shipping Policy Act 1987.
- Merchant Shipping (Port Waste Reception Facilities) Act 2003.
- Merchant Shipping Act (MSA) 1995.
- Hazardous Waste Regulation Act 2003.
- Environmental Protection Act 1970.
- The Environmental Protection (duty of care) Regulation 1991.
- Control of Pollution (Oil Storage) Regulation 2001.
- Merchant Shipping Act, 2007.
- Federal Environmental Protection Agency Act 1992.
- Harmful Waste (Special Criminal Provisions Act 1988).
- Oil in Navigable Waters Act 1954.
- The Federal Environmental Protection Decree 58 of 1988, As Amended by Decree 59 of 1992 and 1999.
- Merchant Shipping (Port Waste Reception Facilities) Regulations 2003.
- Federal Environmental Protection Agency Act (Decree 458 of 1988).
- Nigerian Maritime Administration and Safety Agency Act 2007.
- Merchant Shipping Act 2007.
- Coastal and Inland Shipping (Cabotage) Act 2003
- The Merchant Shipping and Fishing Vessels (Port Waste Reception Facilities) Regulations 2003. These regulations replaced the 1997 ones.
- Federal Environmental Protection Agency Act 1992.

Table of Contents

CHAPTER 1	6
GENERAL OVERVIEW OF LEGAL REGULATION ON PORT WASTE	6
MANAGEMENT IN THE UK AND NIGERIA	6
1.1 Introduction	6
1.2 Research Aim & Objectives	7
Aim	7
1.3 Objectives	7
1.4 Research Questions	8
1.5 Research Background	8
1.6 Literature Review	9
1.7 Justification for the Research	23
1.8 Scope of the Study	29
1.9 Relevance of Research in Comparing the UK and Nigeria	29
1.10 Structure of the Study	32
1.11 Summary	33
CHAPTER 2	34
LEGAL REGULATIONS ON PORT WASTE MANAGEMENT THE IN UK AND NIGERIA	34
2.1 Introduction	34
2.2. Global Legal Regulation on Port Waste Management	34
2.2.1 The United Nations Convention on the Law of the Sea, 1982.....	36
2.2.2 International Convention for the Prevention of Pollution from Ships 73/78	40
2.2.2.1 Implementation and Enforcement of MARPOL.....	44
2.2.2.2 Flag State Jurisdiction	45
2.2.2.3 Port State Jurisdiction.....	46

2.2.2.4 Coastal State Jurisdiction	48
2.2.3 The International Convention for the Prevention of Pollution of the Sea by Oil.....	49
2.3 Regional Legal Regulatory Frameworks on Port Waste Management in the UK and Nigeria	51
2.3.1 EU Directive 2000/59/EC	53
2.3.1.1 Implementation and Enforcement of the EU Directive 2000/59/EC	55
2.3.2 Regional Memorandum of Understanding of Post State Control.....	57
2.3.2.1 Paris Memorandum of Understanding	60
2.3.2.2 Tokyo Memorandum of Understanding	61
2.3.2.3 Abuja Memorandum of Understanding on Port State Control for West and Central African Region	62
2.3.2.4 Enforcement and implementation of the MOUs in the UK and Nigeria	63
2.4 UK National Laws on Port Waste Management.....	65
2.4.1 Environmental Protection Act 1970	66
2.4.2 Waste Management Licensing Regulations 1994	68
2.5 Nigeria National Laws on Port Waste Management	68
2.5.1 National Environmental Standards and Regulations Enforcement Agency (Establishment) Act, 2007	69
2.5.2 The Nigerian Maritime Administration and Safety Agency Act 2007	70
2.5.3 The Merchant Shipping Act of 2007	73
2.6 Summary.....	77
CHAPTER 3.....	81
IMPACT OF SHIP-GENERATED WASTE AT THE PORTS IN THE UK AND NIGERIA	81
3.1 Introduction.....	81
3.2 Port Ship-Generated Waste and Management.....	82
3.3 Ship-Generated Wastes and its Impacts on the Marine Environment	83

3.4 Port Approach towards Ship-Generated Waste and Port Waste Management	88
3.5 Impact of Ship-Generated Wastes in UK Ports.....	90
3.6 Impact of Ship-Generated Wastes in Nigeria Port	94
3.7 Impact of Ship-Generated Wastes on Ports of Call	96
3.8 Operational Discharge of Ship-Generated Wastes at Port	98
3.9 Summary	103
CHAPTER 4.....	105
PORTS WASTE RECEPTION FACILITIES IN THE UK AND NIGERIA	105
4.1 Introduction.....	105
4.2 Port Waste Reception Facilities	105
4.3 Port Waste Reception Facilities in UK Ports.....	109
4.3.1 Southampton Port and its Waste Management Reception Facility Approach.....	111
4.3.2 United Kingdom Port Reception Facilities and Charging Policy	113
4.4 Nigerian Port Waste Management and its Reception Facilities	122
4.5 General Overview of Port Waste Reception Facility Management	130
4.6 Summary	134
CHAPTER 5.....	136
RESEARCH METHODOLOGY.....	136
5.1 Introduction.....	136
5.2 Justification of the Chosen Methodology	137
5.2.1 Social Constructionism.....	142
5.2.2 The Ecological Model.....	143
5.3 Key Research Objectives	145
5.4 Method of Data Collection	145
5.4.1 Interview Design.....	145

5.4.2 Sampling and Respondents	147
5.4.3 Interview Process	149
5.5 Method of Data Analysis	151
5.5.1 The First Stage of Analysis and Organisation of the Material:.....	151
5.5.2 The Second Stage of Content Narratives Analysis	153
5.5.3 Content Analysis	157
5.5.3.1 The Recording Unit.....	160
5.5.3.2 The Context Unit.....	160
5.5.3.3 Development of Typologies and Central Categories	161
5.5.3.4 Coding	161
5.6 Summary	162
CHAPTER 6.....	163
DATA ANALYSIS AND DISCUSSION	163
6.1 Introduction	163
6.2 Existing Legal Regulations of Port Waste Management	166
6.3 Impact of Unmanaged Waste on Community and Business.....	172
6.4 Effective Port Waste Management	179
6.5 Main Findings and Results	186
6.6 Summary	188
CHAPTER 7.....	190
RECOMMENDATIONS, CONTRIBUTIONS AND CONCLUSION	190
7.1 Introduction	190
7.2 Legislative Deficiencies and Lack of Proper Implementation of the Enforcement Procedures of the Legal Regulations on Port Waste Management Measures.....	193
7.3 Restrictions of Existing Instruments to Address Port Waste	194
7.4 Lack of Adequate Collaboration and Inadequate Participation of States in International and Regional Agreements.....	195

7.5 Inadequate Data on Port Waste Management.....	196
7.6 The Structure of Government in Both the UK and Nigeria	197
7.7 Recommendations.....	199
7.7.1 Development of a New International Instrument to Tackle the Port Waste Problem.....	199
7.7.2 Modifying Present Instruments to Narrow Exceptions and Elucidate	200
7.7.3 Creation of All-Inclusive National Port Waste Management Schemes ...	200
7.7.4 Enhancing Participation and Cooperation of States in International and Regional Initiatives	201
7.7.5 Strengthening Management Measures on Fishing Vessels	201
7.8 Conclusion.....	202
REFERENCES.....	204
Appendix 1: MARPOL Regulations Relating to Reception Facilities.....	236
Appendix 2: Interview Consent Documents	237
.....	239
Appendix 3: Interview Questions.....	241

CHAPTER 1

GENERAL OVERVIEW OF LEGAL REGULATION ON PORT WASTE

MANAGEMENT IN THE UK AND NIGERIA

1.1 Introduction

The purpose of this chapter is to underscore the present challenges of legal regulations of port waste management in the United Kingdom and Nigeria, through the presentation of detailed analysis of the problems of ineffective port waste management. The research has been systematically conducted via the evaluation of previous published and unpublished materials from extensive variety of sources. The research focused on ship-generated waste, operational discharge of waste by ship at the port, and its legal framework. The research questions were based on the gaps discovered in the literature reviewed and answered vis-à-vis data analysis. The qualitative research methodology was adopted to address the deficiency of ineffective port waste management along with its economic implications at the port.

Ports are relevant industries for the transportation of goods, playing a significant part in maritime environmental impacts, and economic progress of a nation resulting from port activities that are beyond the boundaries of the port area.¹ This has led to the creation of permanent port communities often called 'seaport' or port-city'.² Until lately, waste at the port was given a little significance in most port around the world, this might be due to the complexity of managing waste at the port.³ In addressing some of these challenges, many environmental, economic and social aspects might be worthy of consideration within the port area with a view to making an informed decision. The quantity and generation rate of port waste has also continued to increase at an alarming rate over the years; this might also be due to development of new modern

¹ Hiranandani, V., 2014. Sustainable Development in Seaports: A Multi-Case Study. *WMU Journal of Maritime Affairs*, 13(1), pp.127-172.

² Wilson, J.S., Mann, C.L. and Otsuki, T., 2003. Trade facilitation and economic development: A new approach to quantifying the impact. *The World Bank Economic Review*, 17(3), pp.367-389.

³ Notteboom, T., 2006. Strategic challenges to container ports in a changing market environment. *Research in Transportation Economics*, 17, pp.29-52.

technology and multifarious activities within and around the port as an industrial area.⁴ The study focused on assessing the issues of potential environmental influences triggered by ineffective waste management via port legal regulations in the UK and Nigeria. In a view to addressing port waste management challenge within the port, few tools and legal frameworks are considered, this includes, the monitoring plan and the management system for port waste.⁵ Consequently, legal regulations have also been recognised for the prevention of ineffective port waste management around the world. In line with 1973, International Convention for the Prevention of waste from Ships, which later modified via Protocol of 1978 (MARPOL 73/78). It operates under the International Maritime Organisation (IMO), for the regulation of waste from ship to the port area.⁶ The regulation sets out in details on how waste can be managed at the port. Nevertheless, there are improvements and shortcomings to the regulation which has been cautiously addressed in the thesis vis-à-vis relevant legislation.

1.2 Research Aim & Objectives

Aim

The aim of this research is to examine the legal regulations of port waste management, and possible ways to reduce discharges of wastes into the port environment in the UK and Nigeria.

1.3 Objectives

The objectives of the research are;

1. To identify the gaps in the relevant international regulations, regional conventions and domestic laws that cover the UK port industry and the Nigerian port industry.
2. To examine the impact of ineffective waste management on the community and business.

⁴ Arlosoroff, S., 1985. WB/UNDP—Integrated Resource Recovery Project: Recycling of Wastes in Developing Countries. In *Appropriate Waste Management for Developing Countries* (pp. 81-94). Springer, Boston, MA.

⁵ Mbande, C., 2003. Appropriate Approach in Measuring Waste Generation, Composition and Density In Developing Areas. *Journal of The South African Institution of Civil Engineering= Joernaal Van Die Suid-Afrikaanse Instituut Van Siviele Ingenieurswese*, 45(3), pp.2-10.

⁶ Curtis, J.B., 1984. Vessel-Source Oil Pollution and MARPOL 73/78: An International Success Story. *Envtl. L.*, 15, P.679.

3. To explore the health and safety and environmental impacts of the ineffective waste management at the ports in both countries.
4. To recommend strategies by which management waste laws can be improved and properly implemented.

1.4 Research Questions

The research will critically evaluate the following research questions:

1. How effective are the legal regulations of waste management in the UK and Nigeria ports in reducing waste at the port?
2. What is the impact of ship-generated waste within the port and on the port host community?
3. What is the impact of waste reception facilities towards the waste reduction of ship-generated waste at the port?
4. How can the regulation of waste at the port be improved and port waste be effectively managed for sustainable national development?

1.5 Research Background

Port waste management is a set of programmes and administrative practices for the protection of the port environment, port users, and port host community.⁷ Regardless of this breadth and importance, of being a competitive differential in several sectors of the economy, it is still little applied in the Nigerian port system. Thus, there is much to be done to incorporate environmental vision into the day-to-day life of the port.

Stakeholders within the maritime industry appear to have adduced reasons and possible solutions to these problems. It has been observed that, apart from ship-generated waste, which is the primary cause of waste at the port, land-based activities around the port also serve as avenue for waste coming into the port.⁸Port seems to have become a receptor as well as an emitter of waste due to multifarious activities at the port.⁹ The impact of ineffective port waste management and other related

⁷ Seguí, X., Puig, M., Quintieri, E., Wooldridge, C. and Darbra, R.M., 2016. New environmental performance baseline for inland ports: a benchmark for the European inland port sector. *Environmental Science & Policy*, 58, pp.29-40.

⁸ Hiranandani, V; supra note 1, pp.127-174.

⁹ Darbra, R.M., Pittam, N., Royston, K.A., Darbra, J.P. and Journee, H., 2009. Survey on Environmental Monitoring Requirements of European Ports. *Journal of Environmental Management*, 90(3), pp.1396-1403.

activities, if not properly managed, could greatly affect the economy and port environment in general.¹⁰

The problem of ineffective waste management is connected with generation of waste at the port. And the following ways possibly have been adduced to reduce waste at the port such as; there should be an adequate waste reception facilities to cater for ship-generated waste by the port authority,¹¹the charging of uniform waste fees by the port authority within the same region, and protection of the marine environment both manually and electronically.¹² Furthermore, port authorities should provide adequate facilities for all manner of ship-generated waste, for effective waste management at the port.¹³The reduction of waste, and its effective management at the port could attract great investment, and increase port efficiency to the port industry if the legal framework is adequately implemented.¹⁴

1.6 Literature Review

There are diverse procedures of port waste transfer, however, the normal strategies are landfill, burning, fertilizing the soil and anaerobic processing and reusing. Albeit, most existing literature focuses on the effects of waste and shipping operations on the port environment,¹⁵ whilst some articles evaluate and emphasize sustainable development and the impact of ship-generated waste.¹⁵ Similarly, Georgakellos has advocated for the use of refund deposit structure, especially in port reception facilities charging systems to enhance a uniform charging system on waste at various ports.¹⁶ However, in the opinion of Wooldridge and Stanajouc this might be difficult

¹⁰ Trozzi, C. and Vaccaro, R., 2000. Environmental Impact of Port Activities. WIT Transactions on The Built Environment, p. 51.

¹¹ Ball, I., 1999. Port Waste Reception Facilities in UK Ports Iwan Ball. Marine Policy, 23(4-5), pp.307327.

¹² de La Fayette, L., 2001. Protection of the Marine Environment in 2000. *Envtl. Pol'y& L.*, 31, p.140.

¹³ Carpenter, A. And Macgill, S.M., 2005. The EU Directive on Port Reception Facilities for Ship Generated Waste and Cargo Residues: The Results of a Second Survey on The Provision And Uptake Of Facilities In North Sea Ports. *Marine Pollution Bulletin*, 50(12), pp.1541-1547.

¹⁴ ORJI, O. G. The Role of Effective Ports Management in Facilitating International Trade in Nigeria <http://www.iiste.org/Journals/index.php/EJBM/article/view/12766> ¹⁵Paipai, E., 1999. Guidelines for Port Environmental Management.

¹⁵ Gupta, A.K., Gupta, S.K. and Patil, R.S., 2005. Environmental Management Plan for Port and Harbour Projects. *Clean Technologies and Environmental Policy*, 7(2), pp.133-141.

¹⁶ Georgakellos, D.A., 2007. The Use of The Deposit–Refund Framework in Port Reception Facilities Charging Systems. *Marine Pollution Bulletin*, 54(5), pp.508-520.

considering economic challenges on individual countries, Wooldridge and Stanajouic also said that there are currently two basic trends in port waste management: policy based and technology-based.¹⁷

A port can prompt environmental problem, over a huge region because of the port's diverse exercises.¹⁸ The expansion in waste generation can influence territorial oceanic ecological quality. The expansion in the volume of delivery activity into and inside the district, ocean-based contamination is likewise a wellspring of concern, particularly along vigorously congested dispatching courses. Oil and substance spill from ships, either from operational exercises or cataclysmic mishaps (i.e. establishing or impact), likewise cause wellbeing dangers.¹⁹

A port with an adequate waste management programme and practice would, therefore, be able to process all kinds of waste that a ship may bring, as long as proper notice is given to the port.²⁰ However, not all ports provide reception facilities for the kinds of waste they receive. Carpenter and McGill completed a study about waste reception facilities at the ports and the results of their survey were that most ports offered some reception facilities.²¹ The study suggested that over half of the ports surveyed offer some facilities for disposing of waste, often with provisions for multiple kinds of waste handling. However, they observed that there are many ports that do not accommodate all types of waste, but there are surrounding ports that may offer other facilities needed. This arrangement of having specific facilities unavailable at a certain port but available at a nearby port creates gap for the malfunctions in some of

¹⁷ Environmental Port Index http://www.clean-baltic-seashipping.com/uploads/files/Environmental_Port_Index_Wooldridge.pdf (Assessed on 11 December 2016).

¹⁸ Ibid.

¹⁹ Hanlan, J.P., 2010. Ship Generated Waste Disposal in The Wider Caribbean Region (Doctoral Dissertation, Worcester Polytechnic Institute, pp 222-666.

²⁰ Ibid.

²¹ Carpenter, A. And Macgill, S.M.; supra note 12, pp.1541-1549.

the ports surveyed without excessive infrastructure. In most cases, this may necessitate waste disposal at a port where a ship did not originally intend to visit.²²

For a port to meet the criteria of the IMO's definition of adequacy, there are some requirements into which a port must fit itself. Important planning by players in the maritime industry such as harbour masters and the crew members responsible for waste management cannot be over-emphasised. This is the key to the success of a well-run port waste facility. It is the job of the crew personnel to communicate with the port's waste management personnel to indicate the ship's specific needs for waste removal once at the port. This information should be provided in a type that conforms to the requirements in Annex I-VI MARPOL 73/78, and the quantity to be removed.²³

Iwan Ball enumerates five major considerations for adequate collection facilities in a port:²⁵ the port should be able to cater for all types of waste landed there; reception facilities should be conveniently located; facilities should be easy to use; the use of those facilities should provide a cost incentive, and periodic inspections should be made to ensure the adequacy of such facilities. The moment such waste has been transported to the port, several requirements for an effective port reception facility must be ensured. The facility must be able to accommodate what is prescribed within MARPOL 73/78 guidelines for waste removal. This means that the port must have an improved way of disposing or reusing each of such wastes, as defined by the IMO.²⁴

In addition to catering for all types and volumes of waste brought to these facilities, a port should also try to ensure that the reception facilities are convenient and provide cost incentives for their use. Inexpensive payments or mandatory payments and minimising delays can act as these incentives. Periodic inspections might also be conducted in order to maintain compliance with MARPOL rules, and it is the duty of individual countries to enforce requirements related to adequacy prescribed by the

²² Clark, X., Dollar, D. and Micco, A., 2004. Port efficiency, maritime transport costs, and bilateral trade. *Journal of development economics*, 75(2), pp.417-450.

²³ Chen, C.L., 2015. Regulation and management of marine litter. In *Marine anthropogenic litter* Springer, Cham. pp. 395-428.

²⁵ Ball, I.; supra note 10, pp.307-337.

²⁴ Pallis, A.A., Papachristou, A.A. and Platias, C., 2017. Environmental policies and practices in Cruise Ports: Waste reception facilities in the Med. *SPOUDAI-Journal of Economics and Business*, 67(1), pp.54-70.

convention.²⁵ The specification for waste offloading are generalised for ports and should be applied in any addition to port reception facilities.

Port waste reception facilities vary in size and complexity. In a very small port, waste may be removed manually, while major ports may have elaborated, efficient, and expensive automated systems. A marina contains a “skip” (a large open container) for waste disposal that is simply emptied periodically.²⁶ Large facilities contain elaborate systems for large-scale waste disposal, and ports designed to accommodate oily waste and chemical tankers have specialised equipment to manage those kinds of waste.

David, Patrick, John, and Chandra noted that the volume of this waste is also significant.²⁹ A port that occasionally hosts cruise ships but can only provide accommodation for a portion of their waste is not adequate.²⁷ Moreover, as ships operate on tight schedules, a facility must not cause undue delay in the removal of these wastes. A modern and efficient set of waste reception equipment will go unused if it is in a remote part of the port or it is not operational for the same hours as the remainder of the port.²⁸ Another major requirement is that ships must give notice of their waste disposal needs. This gives enough time for the port to prepare, though it may be difficult for smaller ports to watch out for any advance notice within a 24-hour schedule basis due to amount of ships calling at the port and turnaround facility available to meet any visiting ship.²⁹

The change endeavours for seaport squander administration frameworks are up with few kinds of operational dangers. Along these lines, numerous basic choices ought to be taken for tackling every day issues, as well as to enhance the general waste

²⁵ Ibid.

²⁶ Poo, K.M., Son, E.B., Chang, J.S., Ren, X., Choi, Y.J. and Chae, K.J., 2018. Biochars derived from wasted marine macro-algae (*Saccharina japonica* and *Sargassum fusiforme*) and their potential for heavy metal removal in aqueous solution. *Journal of environmental management*, 206, pp.364-372. ²⁹

David G., Patrick Rigot-Muller, John M. And Chandra L, “The Role of Sea Ports in End-To-End Maritime Transport Chain Emissions”, *Energy Policy*, 64, 2014, pp.337-348.

²⁷ Ibid.

²⁸ Ship Generated Waste Disposal In the Wider Caribbean Region https://web.wpi.edu/Pubs/Eproject/Available/E-project-121610-185147/unrestricted/Team5_USCG1_IQP_FINAL.pdf (Assessed on 24 July 2017).

²⁹ Ibid.

administration execution of the port.³⁰ Notwithstanding, the administration can be arranged in view of alternate points of assessment, for example, vital, financial and operational. Hence, the inside elements of seaport squander administration frameworks, these administration choices are normally taken inside a situation of vulnerability, inconstancy and restricted assets.³¹

The effect of port waste administration inside the setting of private or open techniques on port effectiveness, port speculation, port openness, port charges assurance, and the foundation of a port system cannot be over emphasised.³² From the financial point of view, few researchers have concentrated on the logical methodologies that can be utilized to evaluate seaport squander administration monetary effectiveness (e.g. cost capacities, reusing expense and benefit cost) as execution pointers mirroring the noteworthiness of seaport squander administration is synonymous with a not too bad marine condition. At last, operational choices consider the streamlining of port waste administration activities, and the best designation of port assets to advance the execution of the entire framework.³³

There are numbers of reasons why the ship-generated waste has been isolated from waste handling practices in a port and in a country. Ships-generated waste becomes a part of the total waste stream of a port as soon as are received ashore. Thus, both ship-generated waste and land-based waste should be operated in an environmentally sound manner. Otherwise, actions taken to reduce pollution can simply shift the problem from the sea to the land or vice versa.³⁴ For example, if ship-generated waste is deposited ashore, contamination of water and human health will be at risk. The waste ashore can cause water pollution through oil spills at the terminals, which has unfavourable implication unless the spilled oil is correctly collected and disposed of.

The aim of preventing and reducing the generation of waste, with the purpose of practice of sustainable consumption habits and a set of instruments is to provide the

³⁰ Everett, S., 2007. Port reform in Australia: Regulation Constraints on Efficiency. *Maritime Policy & Management*, 34(2), pp.107-119.

³¹ Ibid.

³² Cullinane, K. and Song, D.W., 2002. Port Privatization Policy and Practice. *Transport Reviews*, 22(1), pp.55-75.

³³ Gardner, B., Marlow, P. and Pettit, S., 2006. Full Cost Recovery in EU Ports Operating as Commercial Undertakings. *Transport Policy*, 13(1), pp.2-21.

³⁴ Ibid.

increased recycling and reusing of solid waste for the good of the environment. Scholars believe that the impact of economic value of recycled or reused vis-à-vis what cannot be recycled or reused cannot be over emphasised. For instance, De Souza Melaré, González, Faceli, and Casadei, have argued that, solid waste management is a set of actions implemented either directly or indirectly in the stages of collection, transportation, transshipment, treatment and final destination of waste.³⁵ It involves environmentally municipal solid waste management plan, required under the law and regulation. A contractual agreement signed between public authorities, manufacturers, importers, distributors or traders, with a view to the implementation of the shared responsibility for the product life cycle.

According to Trivedi, Singh, and Chauhan, the main sources of solid waste are domiciliary, commercial, public, industrial, agricultural activities, mining activities, rubble, health services, radioactive waste and waste effluent treatment (sludge), among other sources less common.³⁶ The classification is made according to the hazard: characteristic presented, depending on their physical, chemical or infectious to present:

- Risk to public health, causing mortality, incidence of diseases or stressing their indexes;
- Risks to the environment when the waste is improperly managed.³⁷

The elements of a waste management strategy comprise a series that can be grouped under three headings: administrative and legal issues; technology; and infrastructure and support services. Port support activities facilitate or assist in the practices such as cabotage; dredging; defeating, and practicing.

Cabotage is navigation between ports of the same country. In the UK, it is considered a modern way due to the extensive navigable coast, which has a lower cost and can

³⁵ de Souza Melaré, A.V., González, S.M., Faceli, K. and Casadei, V., 2017. Technologies and decision support systems to aid solid-waste management: a systematic review. *Waste management*, 59, pp.567-584.

³⁶ Trivedi, A., Singh, A. and Chauhan, A., 2015. Analysis of key factors for waste management in humanitarian response: An interpretive structural modelling approach. *International Journal of Disaster Risk Reduction*, 14, pp.527-535.

³⁷ Ibid.

carry a greater volume of cargo.³⁸ Among port activities, it is considered as the least natural use of the country's waterways and reduces the emission of CO₂ and Nox in the atmosphere. The solid waste generated is the loss of load along the path, as can on any other transport. The company has to calculate and compares the number of gases emitted and trees cut by type of modal.

The term dredging by definition is the excavation or removal of soil or rocks from the river bottom, lakes, and other bodies of water through equipment called "dredge", which is usually a floating vessel or platform equipped with necessary mechanisms to remove the soil.³⁹ This practice generates impact to the environment since in its action every ecosystem is modified with the dredging activity. For this reason, it is very important in the monitoring of organs and responsible supervision from the type of port operation, ensuring compliance with the stipulated standards. Onyemechi, elucidates on impart of environmental activities in dredging and removal of the dredged material which can have a direct impact on marine environments and organisms, or indirect effects attributed to in water quality.⁴⁰

Physical disturbances, associated with the removal and relocation of sediments, destruction of habitats and alteration of the life that inhabits the site modified by external practices, increases the mortality of these organisms through injuries caused by mechanical action during dredging, or by asphyxiation as these are sucked by the dredger. As for the indirect effect, the release of the bottom sediment repositioned contaminants and nutrients affecting water quality and overall estuarine chemistry, harmful to all life present in this eco-system broken by this operation. Types of dredges Manap and Voulvoulis, stated that the types of dredging operations exist are defined as follows:⁴¹

³⁸ Onyemechi, C., 2015. Benefit maximizing criteria from the Nigerian Coastal and Inland Shipping Cabotage Policy. *Revista de Gestão Costeira Integrada-Journal of Integrated Coastal Zone Management*, 15(3).

³⁹ Ibid.

⁴⁰ Onyemechi, C., 2015. Benefit maximizing criteria from the Nigerian Coastal and Inland Shipping Cabotage Policy.

⁴¹ Manap, N. and Voulvoulis, N., 2015. Environmental management for dredging sediments—The requirement of developing nations. *Journal of environmental management*, 147, pp.338-348. ⁴⁵ *Revista de Gestão Costeira Integrada-Journal of Integrated Coastal Zone Management*, 15(3). Wu,

- Deepening or Virgin dredging;
- Maintenance Dredging;
- Dredging of Environmental or Ecological Recovery;
- Mining Dredging;
- Special Dredging;

Dredging for hydraulic landfills as far as port support is concerned, there are dredging of maintenance and dredging of deepening or virgin. Within this context, the type of dredging process is defined as reported by.⁴⁵

- Mechanical Dredging Processes;
- Hydraulic Dredging Processes;
- Pneumatic Dredging Processes.

The use of waste generated due to port dredging is a necessity that seeks an efficient marine eco-friendly implementation of the dredged area in which monitoring of such situations of biotic and abiotic elements is considered. Possible treatments and uses of dredging wastes for socio-economic reasons of the coastal zone with all its activity of use and occupation. Vogt et al., reported that the dredged material is composed predominantly of particles minerals ranging from coarse to fine sand, silt and clay.⁴²

In addition to having, other types of material, such as stone, wood, pieces of metals and glass, and large quantities of water and organic matter, Manap and Voulvoulis pointed out a study that directs the best use and selection of this material dredged.⁴³ To decide the appropriateness of the dredged material for valuable uses, a few information is required for characterisation tests portrayed by Vogt et al., It can give information that can decide the reasonableness of a dredged material for a utilize, demonstrating the structure for tests and assessments of advantageous employments of dredged material such as;⁴⁴

- Identify the market;
- Determine qualitatively and quantitatively, and assess the properties of materials;
- Conduct the characterisation tests;

C.C., 2016. Towards an African-Focused Ecocriticism: The Case of Nigeria. University of Nevada, Reno.

⁴² Vogt, C., Peck, E. and Hartman, G., 2018. Dredging for Navigation, for Environmental Cleanup, and for Sand/Aggregates. In Handbook on Marine Environment Protection Springer, Cham.pp. 189-213.

⁴³ Manap, N. and Voulvoulis, N., supra note 43, pp 338-355.

⁴⁴ Vogt, C., Peck, E. and Hartman: supra note 45, pp189-222.

- Present test results to local authorities;
- Acquire any and all licenses if necessary;
- Coordinate the local entities that require the product;
- Develop the marketing plan;
- Submit the plan to an appropriate entity.

Defeat deforestation is the process of removal and destruction of submerged rocks, which consists of a series of explosions at the bottom of the bay in order to increase its shut up. Overcrowding re-equips the access channel and basin of site evolution. Kollikkathara, Feng, and Stern stated that the dredging service consists of excavation and removal (removal, transport and dumping) of soil, decomposed or dismantled rocks (by overturning), submerged at any depth and by means of various types of equipment (mechanical or hydraulic) in seas, estuaries and rivers, where the potential cost and environmental impacts should be considered.⁴⁵ According to Vogt et al, the overthrow consists of the dismantling of hard rock, in which two methods were used:⁴⁶

- Hot: dismantling of rock with the use of explosives;
- Cold: Rock dismantling with the use of percussion equipment.

Both methods can be used both on the surface and below the water level, underwater. The procedure of rock-clearing with the usage of explosives is standardised in the case of the implications of the use of explosives, it is necessary to observe several factors for the realisation,⁴⁷ listed below:

- Interference with traffic and nearby roads;
- Difficulty in the location of holes and placement of loads;
- Weather condition and visibility underwater (when underwater);
- Vibration of the terrain, impact of the air and throwing of fragments of rock beyond the area of operation;
- Existence of sediments on the material to be disassembled;
- Communication with the land;
- Protection of the personnel involved and in the environment;
- Less possible damage to existing rock and structures.

⁴⁵ Kollikkathara, N., Feng, H. and Stern, E., 2009. A purview of waste management evolution: Special emphasis on USA. *Waste management*, 29(2), pp.974-985.

⁴⁶ Vogt, C., Peck, E. and Hartman, G: supra note 45, pp.189-213.

⁴⁷ Kollikkathara, N., Feng, H. and Stern, E: supra note 48, pp.974-999.

There are maximum limits set for effects arising from the use of explosives in the dismantling of rock, and the main effects and damages are mentioned below:⁴⁸

- Cured and fresh concrete structures;
- Fauna and Flora;
- Divers;
- Barges nearby;
- Ducts or other special structures inside the water.

There are no standards for this phenomenon, it depends on the experience of technicians to prevent the effects. The hydrodynamic pressure causes explosive detonation, only below the water level. When detonating explosives to dismantle rocks, vibrations may cause, depending on the magnitude, damages to lateral slopes, when carried out in rivers; bridge pillars; concrete tunnels and tunnels; metal ducts; and real estate.⁴⁹The possibility of ultra-lighting should be eliminated through care taken during the preparation in the place of detonation, among which we can cite:⁵⁴

- Preparation of a good fire plan (explosive discharge);
- Maintenance of ground cover;
- Additional fire protection and cover.

Among the existing technologies to overthrow, it is worth mentioning that it has been tested. The technology uses a CS Plasma capsule, a product made up of metal and metal salts.⁵⁰ In summary, the technology for overthrow consists of a thermochemical reaction caused by discharge of high voltage electric power in the capsule inserted in a confined space, occurs in the exothermic expansion. At this time, ultra-high temperatures and extremely high thermal energy values are rapidly generated with the formation of nitrogen and oxygen gases, with lower speed of industrial explosives", as detailed a technician who participated in the action.⁵¹ Another technology that can be used is the industrial explosive. Comparing the two technologies, it can be

⁴⁸ Ji, Z.G., 2017. Hydrodynamics and water quality: modelling rivers, lakes, and estuaries. John Wiley & Sons.

⁴⁹ Ibid.

⁵⁴ Ibid.

⁵⁰ Alexander, G.N., Alexey, A.V., Andre, D.B. and Anatoly, S.V., 2016. Environmentally friendly technological system of cutting using magnetic microcapsules and cutting tools with nanoscale composite coating. *Procedia clrP*, 41, pp.829-834.

⁵¹ Ibid.

stated that the first model, which uses the capsule CS Plasma generates an expansion almost four times greater than the industrial explosive, besides shock, vibration or noise, without causing structural or environmental impacts.

For the use of industrial explosives, fire-based overthrow is generally selected among other techniques by factors that lead to the impossibility of using other alternatives, or still, better adaptation to the various conditions that favour their employment.⁵² The unavailability of a specific equipment in a given transporting machines to a particular place end up favouring the use of explosives, which, although involving rigid and bureaucratic legislation are easily transported. Among other factors limiting the choice of other techniques, the economics and geological-geotechnical aspects can also be mentioned. It can be pointed out that the stages of explosive in underwater detonation, mechanical excavation (if necessary) and transport of materials.

Dodbiba, et al., asserted underwater detonation contains numerous similarities to other types of detonation.⁵³ However, among the aspects that differentiate rock stripping by explosives executed in mining (open or underground) or in works on land, if the most obvious is where the underwater detonation operation occurs. Technically, underwater decompression operations can be performed aiming, among other purposes clearance and widening of the navigable range of a channel, extension of mooring berths to accommodate larger ships and deepening the seabed in cribs as well as in the manoeuvring basin.

Impacts caused during the overthrow operation includes damage to historical and archaeological heritage, navigation and port activities besides affecting fishing, risk of accidents with explosives, the structures of civil works, and changes in habitats (affecting fauna and flora).⁵⁴ The following mitigating measures stand out in order to reduce the impacts of overcrowding.

- Prior realisation of the integrity inventory of the buildings for each operation
- Execution of insulation ditches

⁵² Vogt, C., Peck, E. and Hartman, G.; supra note 54, pp.189-223.

⁵³ Dodbiba, G., Murata, K., Okaya, K. and Fujita, T., 2016. Liberation of various types of composite materials by controlled underwater explosion. *Minerals Engineering*, 89, pp.63-70.

⁵⁴ Ibid.

- Safety in the handling of explosives in accordance with current regulations
- Adequate disclosure in the area of influence of the works
- Reporting with technical information for possible corrective measures
- Inspection by divers after overturning • Assessment balances.

The practicing service excerpt from regulating the flow because it allows the ships of the allies for free entry to the ports, and if necessary, those two referred to any risk in entering or leaving it. It is understood that practicing is an efficient way to ensure the safety of vessels traveling on long-haul territorial eagles by coast or inland navigation. The provision of service of practice is made available 24 hours a day throughout the year and is fundamental for the safe movement of the various loads that enter and leave the ports.⁵⁵

From the initial milestone, the UK laws were enacted in order to improve and delineate each practice pertaining to waterway activities. Huang et al., defined such practices of the advisory activity between the practitioners and determined that the service of practice should be permanently available.⁵⁶ To determine the remuneration to be paid for the service, which must contain the three elements for the calculation of the value, however, must be freely negotiated in accordance with the interest of both parties.⁵⁷

The competence of the legislative bodies and role of the government is to regulate services, as well as establishing the Practice Zones.⁵⁸ The water professionals qualified for this activity have extensive technical knowledge and experience in the region where it operates because of safeguarding human life in the procedures for manoeuvring ships, as well as guiding commanders about geography local. The practical profession is regulated by the maritime authority. According to the legislation,

⁵⁵ de La Fayette, L., 1996. Access to ports in international law. *The International Journal of Marine and Coastal Law*, 11(1), pp.1-22.

⁵⁶ Huang, S.Y., Hsu, W.J., Fang, H. and Song, T., 2016. MTSS--A Marine Traffic Simulation System and Scenario Studies for a Major Hub Port. *ACM Transactions on Modeling and Computer Simulation (TOMACS)*, 27(1), p.3.

⁵⁷ Huang, S.Y., Hsu, W.J., Fang, H. and Song: supra note 59, p 3.

⁵⁸ Hens, L., Block, C., Cabello-Eras, J.J., Sagastume-Gutierrez, A., Garcia-Lorenzo, D., Chamorro, C., Mendoza, K.H., Haeseldonckx, D. and Vandecasteele, C., 2018. On the evolution of "Cleaner Production" as a concept and a practice. *Journal of Cleaner Production*, 172, pp.3323-3333.

the practice service will be executed by duly authorised practitioners, individually, organised into associations or contracted by companies.

The quantity can be defined according to the volume of vessel traffic, time and the degree of difficulty for the accomplishment of the practices of maintenance, maximum working load of the trainee, according to legislation. The number of professionals in each of the Practice Zones (PZ) is established in accordance with the characteristics provided for in the regulations.⁵⁹ The areas are divided by Civil Societies, responsible for the allocation and the acquisition, implementation and uninterrupted operation of an infrastructure that supports, consisting of watchmen, operators, and crew. Practical Zone (ZP) is the geographical area delimited by virtue of local peculiarities to impede the free and safe movement of vessels, requiring the constitution and uninterrupted operation of the Practical Service for this area.⁶⁰ The practice zones are organised by following the characteristics in:

- Frequency of ships;
- The tonnage of ships;
- Type of vessels practiced;
- The location of ports and terminals.

The constant concern in the provision of the service to vessels, granted to the port results in the complexity.⁶¹ In this structural complexity is consists of:

- Own Administrative Office;
- Operations Centre (watchtower);
- Bridge for vessel operation;
- Shipyard for maintenance and repair of boats, with considerable stock of parts spare parts;
- Employees (not practical);
- Bar launches (fifth in construction);
- Port launches;
- Mooring boats;
- Communications equipment, traffic coordination and weather station.

The port operations and the risks to the practice service with the constant need to deepen the channels for the passage of ships from the impacts of the geography to

⁵⁹ Ibid.

⁶⁰ Ölçer, A.I. and Ballini, F., 2018. Energy Management in the Maritime Industry. In Corporate Social Responsibility in the Maritime Industry Springer, Cham.pp. 131-148.

⁶¹ Robinson, N.A., 2017. Environmental regulation of real property. Law Journal Press.

the manoeuvres performed on the channels. According to Robinson, maintenance dredging, when executed, contributes to the contamination of estuary waters due to sediment toxicity.⁶² However, many families rely on fishing as a way of livelihood, within society. The Socio-environmental Services for Land Use in an Area Aimed at Port Activity, identifying overlaps between the canal and the artisanal fishing routes, where there is a junction of the Island, make them paths of this fishing route.⁶³

As impacts of the implementation of infrastructures are changes in the coastal dynamics, with induction of erosion and silting processes and changes in the coastline; mangrove suppression and other coastal ecosystems; dredging effects and landfills; impairment of other uses of resources environmental, especially traditional ones; and alteration of landscape. Due to the sensitivity of the Santos estuary and the large volume of vessels, and the different conditions of navigable areas, it is important to check for risks and consequences that can affect human life and port environment. Among what was researched and analysed, was that there is a need to include waste management in port support activities.⁶⁴

All reported activities have some impact on the environment, and few mitigating actions and the waste generated by these activities is not quantified or qualified. Therefore, port support activities are of utmost prominence for the improvement of port waste management. It concludes that solid waste management and port support activities, such as Cabotage, Dredging, Skidding, Towing and Practicing, it was clear that all support operations cited are great causes of waste, damages, impacts, and damages to the environment. The environment and society are of the utmost importance for the continuous port development, which automatically with the advancement of port structures, end up bringing benefits to the region and its population. As these operations cannot be extinguished, improvements in management and follow-up on these registries are recommended. The negative effects, proposing improvements and mitigating actions in favour of the environment,

⁶² Ibid.

⁶³ O'Brien, C.E., Johnston, M.W. and Kerstetter, D.W., 2017. Ports and pests: Assessing the threat of aquatic invasive species introduced by maritime shipping activity in Cuba. *Marine pollution bulletin*, 125(1-2), pp.92-102.

⁶⁴ Ibid.

results, and numbers, to chart a plan of tasks and goals to be followed, create a pattern.

1.7 Justification for the Research

Ports are vital elements for international trade, ship-generated waste is expected to be adequately managed to reduce waste generation and waiting time for ship berth at the port. Hence, this will enhance port productivity, and end longer mooring time for ship operation, disruptions, packaging breakdowns and product losses would be reduced at the port.⁶⁵ Port environmental management is the administration of environmental demands aiming at the sustainable development of productive activity and the reduction of costs as collective waste treatment solutions, effluents, and emergency actions and monitoring.⁶⁶

The environmental waste management of port areas, and importance in political discussions in the press are relevant to a structure composed of international bodies (IMO).⁶⁷ National and specialists in several areas, contributing to the analysis and definition of the guidelines on the main issues environmental variable in the area of port waste management.⁶⁸ The environmental actions of municipal and state bodies become quite restricted and fragmented, being to date a national programme of action capable of managing the environmental problems. The Nigerian Law on port, as it came to be known, has therefore brought a profound reformulation in the concepts put into practice at the port. Particularly with regard to the operation of the facilities, the provision of services, capital-labour relations, administration and participation in port activity.

Port waste represents those materials or substances that are no longer serviceable or capable of any economic use, resulting from activities of urban, industrial, health, agricultural and commercial services, and those from port, airports and borders. This

⁶⁵ Dwarakish, G.S. and Salim, A.M., 2015. Review on the Role of Ports in the Development of a Nation. *Aquatic Procedia*, 4, pp.295-301.

⁶⁶ Ibid.

⁶⁷ Hewitt, C.L., Gollasch, S. and Minchin, D., 2009. The vessel as a vector–biofouling, ballast water and sediments. In *Biological invasions in marine ecosystems* (pp. 117-131). Springer, Berlin, Heidelberg.

⁶⁸ Gollasch, S., David, M., Voigt, M., Dragsund, E., Hewitt, C. and Fukuyo, Y., 2007. Critical review of the IMO international convention on the management of ships' ballast water and sediments. *Harmful algae*, 6(4), pp.585-600.

is in addition to those contaminated by pesticides.⁶⁹ Hence, considering the increase in port waste handling with direct implication on the maritime environment, and concern for adequate waste management at the port. In addition, to a legal and regulatory requirement, revealed to be a prominent factor to be considered in the management of the port waste.⁷⁰

Port waste management is also one of the most challenging issues around the world. Most ports are facing a tremendous pollution challenge as a result of huge quantities of waste generated from ships and multifarious activities at the port. Also, inadequate formulated and poorly implemented environmental policy among the stakeholders often resulted in ineffective port waste management. This provides a justification for this research among other factors identified as gaps in the literatures which are discussed subsequently in the thesis. It should be stressed that lack of holistic implementation of waste management laws in a developing country like Nigeria, insufficient waste reception facility and corporation among the various stakeholders, within the maritime industry will affect the environment and how ship to operate.

The research also identified slink conformity and enforcement of the laws, and lack of incentive to generate new waste management facilities that can cater for all manner of ship-generated waste at the port most especially in Nigeria. Though, it seems clear from the author's findings that there is no study in the past that has attempted to undertake a comprehensive analysis of legal regulations on port waste management between the UK and Nigeria. Hence, the justification for this research in view of pivotal roles port plays in integrated transport chains both at regional and global economies.

The difficulties linked with the waste management and generation at the port is presently a matter of top priority on both the environmental and political agendas of different countries.⁷¹ The MARPOL (73/78) only sets some guide for the port authorities on the specific waste that can be managed within the port.

⁶⁹ Gollasch, S., David, M., Voigt, M., Dragsund, E., Hewitt, C. and Fukuyo, Y., supra note 71, pp, 586600.

⁷⁰ Gollasch, S., David, M., Voigt, M., Dragsund, E., Hewitt, C. and Fukuyo, Y: supra note 71, pp, 585600.

⁷¹ Lam, J.S.L. and Notteboom, T., 2014. The greening of ports: a comparison of port management tools used by leading ports in Asia and Europe. *Transport Reviews*, 34(2), pp.169-189.

In the United Kingdom, around 95% of the trade volume is represented by 600 ports and harbours, handling a billion tons of cargo.⁷² United Kingdom Government introduced the new legislation that requires ports, harbours, marinas to operate and address the ship-generated waste through existing facilities as well as contain a plan for port wastes in relation to facilities and provision of port waste facilities.⁷³ The legislative bodies obligate authorities to form initiatives to reduce port pollution relevant to all commercial and leisure activities at the UK ports.⁷⁴

There was an initiative taken by the UK Government which had to be implemented throughout ports and it involved a comprehensive consultation exercise. This exercise elaborated on 18 measures to combat the port waste effect from its source.⁷⁵ The Government completely acknowledges that no single solution can address the port wastes issues. Since, the port waste is not generated in isolation with all types of maritime activities and are not only confined to commercial waste discharged or shipping activities, while these maritime activities have their economic and operational circumstances.⁷⁶ Thus, the Government of the UK, enforced three major elements for the new initiative. First to make control of improving and enforcing the regulations more effectively. Second to improve the facilities available for the port to disposed of waste legally. The third was to increase the number of penalties in case of illegal port waste discharge.

In the UK, the fundamental concept of management and planning of the port waste is premise on the fact that such waste reception services need to comply with the users and environmental constraints. Thus, it should be ensured that wastes are removed

⁷² Maritime And Shipping Statistics - GOV.UK

<https://www.gov.uk/government/collections/maritime-and-shipping-statistics> See Also UK Port Demand Forecasts To 2030 Final Report By MDS Trans Modal Limited

<http://webarchive.nationalarchives.gov.uk/+/http://www.dft.gov.uk/consultations/archive/2006/ppr/ukportdemandforecaststo2030.pdf> (Assessed On 23 June 2017).

⁷³ Merchant Shipping And Fishing Vessels (Port Waste Reception Facilities) Regulations 2003 (2003 No 1809) <https://lexisweb.co.uk/si/2003/1801-1900/merchant-shipping-and-fishing-vessels-port-waste-reception-facilities-regulations-2003> See Also

<http://extwprlegs1.fao.org/docs/html/uk39253.htm> (Assessed On June 2017)

⁷⁴ Guidelines for Managing Water Quality Impacts Within UK European Marine Sites http://www.ukmpas.org/pdf/activities/water_quality.pdf (Assessed On June 2017).

⁷⁵ [file:///C:/Users/User/Downloads/MCGA-Port Marine Guide to Good Practice NEW-links%20\(1\).pdf](file:///C:/Users/User/Downloads/MCGA-Port%20Marine%20Guide%20to%20Good%20Practice%20NEW-links%20(1).pdf) (Assessed On June 2017).

⁷⁶ Ibid.

as much as they are practicable.⁷⁷ However, it should be noted that assuming adequacy is not allowed due to the availability of the spare capacity or the absence of complaints regarding ports' users or individual facilities.⁷⁸

The UK Government settled that there was no straightforward arrangement, which would guarantee better arrangement and utilization of port waste gathering offices, since squander at the port emerges from a wide range of oceanic action, not just business shipping. Thus, should addition be uncovered in progression of this study, UK has consequently built up a coordinated way to deal with handling of port waste, considering a bundle of measures went for a wide range of port and harbour experts went for a wide range of boats.⁷⁹

On the other hand, in Nigeria, the state of present port advancement might be drawn to the British colonisation of Lagos, an infamous focus of the Transatlantic Slave Trade, in 1861, and the resulting colonization of the Nigerian state.⁸⁰ Lagos, in south-west Nigeria, rose as the main port, after broad and costly harbour works amid the provincial time frame between years 1861-1960.⁸¹ Port advancement opposite waste administration wavered amid this period from focus to dispersion. As far as the organization of Nigerian ports was concerned, the arrangement was described, up to the mid-1950s, by a blend of duality of control and mixture of specialist.⁸²

First, the duality of control suggests that personal interests from organisations like the United African Company and the Elder Dempster Shipping Line specifically can efficiently administer some actions such as lighterage, and control certain ports. Second, there was a duplication of functions among the different departments such as Port Engineering, Railways, and Marine. Each of these departments perform different functions that facilitate the smooth running of port operations. Such functions could range from transport, rate collection, pilotage to harbour works. The governmental

⁷⁷ Waste Management Planning Process for Ports and Harbours
[Http://Www.Ukmarinesac.Org.Uk/Activities/Ports/Ph20.Htm](http://www.ukmarinesac.org.uk/activities/ports/ph20.htm) (Assessed on June 2017)

⁷⁸ Ibid.

⁷⁹ Eltis, D., 2001. The Volume and Structure of The Transatlantic Slave Trade: A Reassessment. The William And Mary Quarterly, 58(1), pp.17-46.

⁸⁰ Ibid.

⁸¹ Olukoju, A., 2014. The Port of Lagos, 1850–1929: The Rise of West Africa's Leading Seaport. In Atlantic Ports and The First Globalisation, C. 1850–1930 (Pp. 112-129). Palgrave Macmillan UK.

⁸² Ibid.

departments at that time, were entangled in discordant departmental rivalry, which always hindered the active management of activities and port waste management.⁸³ The effective management of the rivalry necessitated series of inquiries and organisational restructurings. However, when the Nigerian Port Authority (NPA) was founded in 1950s, a similar order was established.⁸⁴

Report reveals that in 2013, the total amount of waste generated by the Apapa port has increased tremendously representing a 5% annual increase since 2000. It further projects that in 2016, port waste generation would have risen by 8%, comparable to approximately 4% growth in a year.⁸⁵ This is apparent in both organisational readiness to meet the challenge of port waste effective dumping and concerns about the variation of fresh materials, which enter its waste streams.⁸⁶ To challenge waste within the Apapa port, the Nigeria government has waste management strategy established in partnership with a private company called 'African Cycle Ltd', for efficient and effective port waste handling.⁸⁷ Though, for more in-depth scrutiny, this system would later be discussed in detail along with the UK waste management plans in the research to establish more proactive approach for port waste management that can stand the test of time.

Thus, the fundamental port waste management gaps in developed and less developed countries like the UK and Nigeria is how to best classify and manage streams of waste at the ports within the present legal frameworks.⁸⁸ Also in the UK, the relevant provisions of MARPOL on the provision of waste reception facilities at the ports, are implemented through its national laws, the Merchant Shipping (Prevention of Oil Pollution) Regulations 1996, and the Merchant Shipping (Prevention of Oil Pollution)

⁸³ Darbra, A. Ronza, J. Casal, T.A. Stojanovic And C. Wooldridge, "The Self-Diagnosis Method, A New Methodology To Assess Environmental Management In Sea Ports", *Marine Pollution Bulletin* 48(2004) 420-428 [Www.Sciencedirect.Com](http://www.sciencedirect.com) (Accessed On 22 October 2014).

⁸⁴ Shneerson, D., 1981. Investment in Port Systems: A Case Study of The Nigerian Ports. *Journal of Transport Economics and Policy*, pp.201-216.

⁸⁵ Ibid.

⁸⁶ Pálsson, G., Harding, A. And Raballand, G., 2007. Port and Maritime Transport Challenges in West and Central Africa. Sub-Saharan Africa Transport Policy Program (Ssatp) Working Paper, 84, p.11.

⁸⁷ Jaja, C.Y., 2011. Freight Traffic at Nigerian Seaports: Problems and Prospects. *Medwell Journals*, 6, pp.250-258.

⁸⁸ Ibid.

(Amendment) Regulations 2000.⁸⁹

Following these regulations, British ports are obliged to possess adequate waste reception facilities so as to effectively dispose wastes within and around the ports.⁹⁰ However, Nigeria is yet to domesticate most of the international conventions acceded to, thereby creating gaps and confusion as to the effectiveness of MARPOL, and other international conventions in force apart from national laws on port waste management in Nigeria.⁹¹ This might create a big challenge to port waste management at the Apapa port due to non-domestication of majorities of the international conventions in line with what is obtainable in other nations like the UK.⁹² This will further be elucidated upon in the research, to give opportunity for more robust argument on the significant on the enforcement of international conventions in Nigeria as it applicable in other developed nations like the UK.

In summary, the justifications for this research further lies within the investigation of the strategies and courses of action being taken by the port authorities in order to ensure effective implementation of the various regulations in port waste management.⁹³ In view of the above, and the fact that Nigeria's maritime industry is in the embryonic stages of modern development, it is important for the country to learn the theories and methods of developed country like the UK. Although, some scholars in Nigeria have undertaken environmental law studies on the environmental impact of waste at the ports, but it appears no scholars have compare the legal regulations of port waste management between the UK and Nigeria.⁹⁴ It is hoped that the result generated will enhance the prevailing body of knowledge and will be beneficial to the future scholars, policy-makers, and regulatory authorities in the maritime industry.

⁸⁹ Duruigbo, E., 2000. Reforming the International Law and Policy on Marine Oil Pollution. *J. Mar. L. & Com.*, 31, p.65.

⁹⁰ *Ibid.*

⁹¹ Akpama, I.O., 2017. Married: Implementation of MARPOL 73/78 In Nigeria.

⁹² Babatunde, I.O. And Akpambang, E.M., 2017. Impediments to Enforcement of Environmental Treaties Against Oil Pollution. *Nnamdi Azikiwe University Journal of International Law and Jurisprudence*, 8(2), pp.12-27.

⁹³ *Ibid.*

⁹⁴ Mizzi, M.I., 2004. An Assessment of The Level of Understanding Regarding Issues of Marine Pollution Regulations in Respect of Waste Management (Annex V) In the Port of Port Elizabeth (Doctoral Dissertation, North-West University). ¹⁰⁰ *Ibid.*

1.8 Scope of the Study

The comparative nature of this research attests with the author's findings, i.e. there seems to be evidence of significant gaps between the port waste management controls of the UK and Nigeria as articulated earlier. However, this is not conclusive, because there might be areas that would be evaluated, as this could be a product of differences in legislatives implementation, government methods and the mode of implementation of waste management system at both ports.¹⁰⁰

The outcome of the research might be a useful to government for further improvement of port waste management scheme. Similarly, it might be useful for agency that has failed to carry out assigned responsibility to curb ineffective port waste management. It would make such ailing agency to wake up from their slumber, as the author assumes that no port would like to be identified and associated with failures in waste management within the area of their control.

It is predictable that the discoveries of this research will further enable policy makers in maritime industry make wise decisions regarding port waste management that will benefit maritime environment. For example, Mike Igbokwe, in his thesis on the law of the sea, observes that "proper consideration should be given to environment planning at the port when port construction projects are being prepared".⁹⁵ He further suggests that when port planning is under way, more attention should be paid to improving the marine environment and to creating space for disposal and proper management of waste to prevent pollution.⁹⁶

1.9 Relevance of Research in Comparing the UK and Nigeria

The motive for selecting this topic is to ascertain the legitimacy and effectiveness of the port waste management laws through a comparative study of the selected ports in the UK and Nigeria via their legal regulations in the international context. This is because port waste management development and its operations remain issues of commercial, eco-friendly, technical and administrative concerns at both local and global levels.⁹⁷ The port authorities should be strongly encouraged to develop

⁹⁵ Jerome, O.U., 2011. "How Has the Nigerian Maritime Industry Performed in The Last 50 Years?" Ships and Ports Weekly, p.4.

⁹⁶ Ibid.

⁹⁷ Kay, R. And Alder, J., 1998. Coastal Planning and Management. CRC Press.

sustainable port waste management plans. The ultimate objective of ports waste management is to offer improved protection for the maritime environment through easy access in the use of port reception facilities for waste generated via ship and cargo remains.⁹⁸

Another importance of comparing the UK and Nigeria rests within the fact that both countries share same legal and political ideology. Similarly, both countries share similar legal system and mode of implementation is similar which will be useful to further address the research with regards to implementation of legal regulations applicable and enforceable to address port waste.⁹⁹ Also, with regards to political ideology, it might appear the UK has demonstrated full capacity by ensuring the internalisation of its international legal obligations, thereby making it enforceable in the UK. On the other hand, Nigeria is yet to domesticate such legal instruments, which of course has created gap, and makes one to wonder as to which international legal instruments govern her port waste management. This seems to have become necessary in order to ascertain and adequately compare with the UK and to see how to strengthen port waste management in Nigeria.

The effectiveness of waste management regulation is largely determined by institutional relations in the two societies. Thus, their central element is the relationship over ownership of natural resources. These relations require development and legislative solutions based on the analysis of the existing social and economic situation, as well as trends for the foreseeable future. The UK and Nigeria are also part of commonwealth countries of fifty-two nations in total, which makes UK and Nigeria suitable for assessment with regards to port waste management. As such, all members state of the Commonwealth also subscribe to its ideals and principles as enshrined in the Commonwealth Charter on the protection of the environment.¹⁰⁰

The duty of handling wastes at the ports lies at the hands of port authorities. The authorities apply different strategies to enhance sustainable growth. One example of

⁹⁸ Ibid.

⁹⁹ Mazrui, A., 2005. Shariacracy And Federal Models in The Era of Globalization: Nigeria In Comparative Perspective. Democratic Institution Performance: Research and Policy Perspectives, 63.

¹⁰⁰ <http://thecommonwealth.org/commonwealth-charter-section/protecting-environment> (assessed on 23 November 2017)

such practice in sustainable development is championed by the Associated British Ports (ABP). Now owned by ABP (Jersey) Ltd, ABP prides itself as a leader in port business that offers port services and facilities to hauliers, cargo owners and accentuates environmental policy on sustainable development.¹⁰¹

Similarly, the Nigerian Ports have same responsibility to follow basic environmental regulations and strategies to guarantee wastes are effectively managed. Some of the objectives of the Nigeria Ports Authority (NPA) is “to safeguard the effective management of port procedures, optimum use of resources and allocation, change sources of income and ensuring suitable returns on its investments, so as to contribute efficiently to the well-being of the Nigerian society”.¹⁰² Although, unlike the ABP, the NPA might appear not to entertain sufficient environmental policies and sustainable development packages in its waste management operational programmes. It is therefore worthwhile to compare and assess the NPA waste management procedures vis-à-vis the UK waste management strategy for more oriented research results.¹⁰⁹ It is necessary to form an economic mechanism for the waste management in the following main directions:

- Improvement of accounting and assessment of the natural and resource potential of the territories;
- methodical and normative legal support for the introduction of payments for the right to use natural resources on the basis of their economic evaluation;
- Improvement of the system of payments for pollution of the environment (normative and methodological documents);
- development of a procedure for evaluating damage caused by environmental pollution;
- Improvement of the system of instruments for financing environmental programmes and activities for port environmental protection from various sources, including funds from environmental insurance funds, environmental and other funds, banks;

¹⁰¹ Christopher F. Wooldridge, Christopher M. and Vicki Howe, “Environmental Management of Ports and Harbours Implementation of Policy Through Scientific Monitoring”, *Marine Policy*, Vol.23, No. 4-5, 1999, pp. 413-425.

¹⁰² <http://www.nigerianports.org/dynamicdata/visionmission.aspx?id=250>(accessed on 18/11/2014).

¹⁰⁹Zhelev, T.K. and Bhaw, N., 2000. Combined water–oxygen pinch analysis for better wastewater treatment management. *Waste management*, 20(8), pp.665-670.

- development of a package of interdepartmental normative legal documents on the improvement of the mechanism for implementing environmental programmes;
- formation of the market of environmental works, goods and services;
- organisation of a licensing system for environmental protection activities;
- Introduction of compulsory and voluntary environmental insurance to cover unforeseen expenses arising from accidents.

1.10 Structure of the Study

The geographical parameters for this study are limited to two major seaports: one in the United Kingdom and the other in Nigeria, namely the Port of Southampton and Apapa Port in Lagos, South-West Nigeria respectively. The categories of waste covered in this study are mainly all types of ship-generated waste intended to be disposed at the port, and waste generated due to multifarious activities which often most affects the marine environment. However, the chemical tankers are not accepted from the requirement point of view other than the speciality of the cargo waste generated on board those vessels.

Consequently, the thesis is divided into seven chapters. Chapter One introduces the background to the research, the need for research, and the research objectives, and it reviews copious literature relevant to the research, which was conducted along two main lines: First, a comprehensive summary of the basic features of port waste management; Secondly, a thorough analysis on the impact of ineffective waste management in both countries. Chapter Two will analyse in depth the various regulatory laws on port waste management, and implementation of the laws in both countries, through the collation of a wide range of material relevant to the research. Chapter Three focuses on analysing the impact of ship-generated waste in the UK and Nigeria ports.

Chapter Four addresses the challenges of port waste reception facilities and compliance with the use of such facilities at the ports in the UK and Nigeria. Chapter Five describes and justifies the methodological choices used for this study, and study limitation. Chapter Six will analyse the new data that will be generated in relation to present the impact of inappropriate waste management in use in both countries, their laws and regulations applied, and gaps exists in the current legal framework. Chapter

Seven makes a comparative analysis of Southampton and Apapa ports waste management legal regulations, and proposed some recommendation based on the findings of the research to advance the body of knowledge in the field of maritime and environmental law.

1.11 Summary

The aim of the research is to examine the legal regulation of port waste management in UK and Nigerian ports and its potential to minimise or eliminate such intentional and non-intentional illegal dumping of wastes into the marine environment. In order to establish a reference point for the research, the researcher analysed the impact of wastes on the community, businesses, and environment. This chapter has set out in detail the problem associated with ineffective waste management at the port, by not limiting its scope to its case study from the outset. In addressing the problem, the effects and shortcomings of some of the international legal instruments and regional actions on port waste management have been highlighted, within the limits and scope of the research.

Consequently, the research aim's and objectives have been articulated in view of the gaps discovered. Similarly, research questions have been designed in a manner that will reveal the present challenges and address the root sources of the problem with a view to unravelling ineffective port waste management in a timely manner. The methodology aspect seems to have been a perfect method for the project in view of its comparativeness nature, as it will involve data collection from various personnel from both ports. The next chapter will be to discuss in detail the legal regulations on port waste management relevant to the research, its implementation and legislative deficiencies in relation to port waste management improvement.

CHAPTER 2

LEGAL REGULATIONS ON PORT WASTE MANAGEMENT THE IN UK AND NIGERIA

2.1 Introduction

Port activities are precedent to environmental legislation and not accompanied by a specific process or policy for ship-generated waste. The functional roles of a port seem to have turned it sometimes into a site of ship-generated waste pollution ground, mostly from port's own activities, land-based and shipping activities.¹⁰³ The provision of adequate waste treatment is the challenge for most country and region ports. Therefore, it is increasingly important that the economic growth of a port must be balanced by the management of waste which is mostly caused by pollution from the ships.¹⁰⁴ The purpose of this chapter is to critically scrutinise or reappraise in detail the various relevant international, regional and national regulations, and their implementation procedures as it affects port waste management in the UK and Nigeria ports respectively.

2.2. Global Legal Regulation on Port Waste Management

The integrated waste management system at port depends, fundamentally, on the fact that each of the actors involved plays their role properly.¹⁰⁵ Port authority can minimise the volume of waste by using compatible technologies, in line with the agreed standards of provision of the ship-generated waste reception facilities at the port. The role of port vis-à-vis terminal manager is to receive and manage a collection of waste from the ship and transport such waste to treatment or disposal facilities available at the local level.

The role of regulating bodies is to provide clear legislation, evaluation of the processes and guidelines that ensure this operation unfolds in a simple, effective, safe and in compliance with legal regulation of port waste management. There is also a need to promote the immediate human resources responsible port inspection of ports.

¹⁰³ Peris-Mora, E., Orejas, J.D., Subirats, A., Ibáñez, S. and Alvarez, P., 2005. Development of a system of indicators for sustainable port management. *Marine Pollution Bulletin*, 50(12), pp.1649-1660.

¹⁰⁴ Gibbs, D., Rigot-Muller, P., Mangan, J. and Lalwani, C., 2014. The Role of Sea Ports in End-To-End Maritime Transport Chain Emissions. *Energy Policy*, 64, DO: Specific. pp.337-348.

¹⁰⁵ Ibid.

Regulations promote an inter-institutional articulation between the supervisory body, environmental management and port terminal managers.¹⁰⁶

It is observed that organisations, super-intendancy of quality, environment and standardisation, work together to minimise port waste problems. There is a clear definition of the port waste and its effect on the environment for supporting awareness of the issue. Equally, there are many regulators and inspectors for the pulverisation and disarticulation of their actions represent obstacles to the implementation of more comprehensive measures that require the formation of interinstitutional partnerships, given the complex nature of the port waste. Management of waste at the port seems to be a typical example of an area that involves partnerships between various national, municipal and state agencies, and the private sector.¹⁰⁷ The existing legal framework leaves no doubt as to the responsibility and obligation to provide ports with reception facilities to provide for all manner of ship-generated waste at the port.

Remarkably, the global conventions on waste management at the port are administered either by the United Nations (UN) itself, or by its affiliated bodies.¹⁰⁸ The most recognised among them is the International Maritime Organisation (IMO), while the United Nations Environmental Programme (UNEP) is the other principal organisation to administer such conventions and commitments.¹⁰⁹ For a clearer and detailed discussion on port waste management, the following international convention instruments are important:

- The United Nations Convention on the Law of the Sea (UNCLOS) 1982.
- The International Convention for the Prevention of Pollution from Ships, 1973, as amended by the Protocol of 1978 relating thereto (MARPOL 73/78).
- The International Convention for the Prevention of Pollution of the Sea by Oil (OILPOL), 1954 (pre-IMO).

¹⁰⁶ Ma, J. and Hipel, K.W., 2016. Exploring social dimensions of municipal solid waste management around the globe—A systematic literature review. *Waste Management*, 56, pp.3-12.

¹⁰⁷ Ibid.

¹⁰⁸ Jin, A.T.K., 1997. The Regulation of Vessel-Source Marine Pollution: Reconciling the Maritime and Coastal State Interests. *Sing. J. Int'l & Comp. L.*, 1, p.355.

¹⁰⁹ Hollis, D. and Rosen, T., 2010. United Nations Convention on Law of the Sea (UNCLOS), 1982. *The Encyclopaedia of Earth*, 22. <http://www.eoearth.org/view/article/156775> (Assessed on 24/03/2016).

2.2.1 The United Nations Convention on the Law of the Sea, 1982

The United Nations Convention on the Law of the Sea 1982, establishes the fundamental framework for all aspects of sovereignty, jurisdiction, duties and responsibilities of the countries in relation to the ports.¹¹⁰ It is the most important in terms of the regulation of the Law of the Sea due to the creation of new institutions of the Law of the Sea, such as the Exclusive Economic Zone, the Passages used for universal navigation, the Archipelagic Waters, the Regime of the Islands and the Court of International Law of the Sea.¹¹¹ This Convention is taken into account as the framework and basis of any future instrument that intends to further define the rights and commitments on the international waters.¹¹² It has also given important results such as:

- The nearly general reception of the twelve miles as the boundary of the national sea.
- The authority of coastal nations with regards to the control of its resources in an exclusive economic zone of not beyond 200 nautical miles.
- The authority of shipment via the passages used for global navigation.
- The authority of the archipelagic nations (comprise of islands) over an area of the sea enclosed by lines drawn among the extreme points of the islands.
- The independent privileges of coastal nations upon its continental shelf.
- The obligation of all nations to achieve and preserve their biotic resources.
- The responsibility of the nations to settle disagreements relating to the clarification or application of the Convention by diplomatic method.
- The multiple options of solution of controversies relative to the clarification of the Convention, such as: International Court of Justice, arbitration and conciliation, and The International Tribunal of the Law of the Sea, the.¹¹³

¹¹⁰ United Nations Convention on the Law of the Sea III, 1982.

¹¹¹ Oxman, B. H. "The Third United Nations Conference on the Law of the Sea: The Ninth Session (1980)." *American Journal of International Law* (1981): pp. 211-256. (Assessed on <http://heinonline.org>).

¹¹² Ibid.

¹¹³ Ibid.

The United Nations Convention on the Law of the Sea 1982 (henceforth, UNCLOS) formerly emerged from traditions and customary laws.¹¹⁴ However, customary law from the international perspective of the sea has been proved to be somehow inadequate to new challenges posed by the sophisticated and ever-increasing use of the sea, such as sea-bed mining, maritime research, navigation and trade by ships, which might be one of the main causes of illegal dumping of waste to the maritime environment.¹¹⁵

The necessity to codify the law of the sea was what led to the United Nations Convention on the Law of the Sea in 1982. It is another binding convention, which became operational on 14 November 1994.¹¹⁶ Part XII of UNCLOS is specifically established to protect and cater for the maritime environment, which appears to cover this research waste management at the port and offers a good all-inclusive legal framework for the progress and implementation of port waste management standards.¹¹⁷

Section 5 of part XII outlines in specific term, the responsibility of states parties to reduce, prevent and control waste at the port and in the marine surroundings.¹¹⁸ UNCLOS became the first legislation that dealt with port waste, including prevention of ineffective waste management at the port. In Art. 237(2), it insists on states implementing specific tasks imposed by other international conventions with respect to stoppage, decrease and control of seaport waste.¹¹⁹ Thus, the Convention puts an implied responsibility onto state parties to establish adequate reception facilities in their ports. UNCLOS “offers the international basis upon which the protection of the marine and port environment takes place”. Waste at the port or ship-generated waste

¹¹⁴ http://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf (Assessed on 23 March 2018)

¹¹⁵ Ibid 123.

¹¹⁶ K.R. Simmonds. The status of the United Nations Convention on the Law of the Sea 1982; *International and Comparative Law Quarterly*/ Volume 43, No. 2, (1985), pp. 359-368.

¹¹⁷ Ibid 10.

¹¹⁸ http://www.un.org/depts/los/convention_agreements/texts/unclos/part12.htm (accessed on 1 January 2018). Charney, J.I., 1994. The Marine Environment and the 1982 United Nations Convention on the Law of the Sea. *The International Lawyer*, pp.879-901.

¹¹⁹ Boyle, A.E., 1985. Marine Pollution Under the Law of the Sea Convention. *American Journal of International Law*, 79(2), pp.347-372.

and land-based sources, frequently happens at the port, and is specifically dealt with under Art.207 and 2013.¹²⁰

Article 207 states that “*States shall adopt laws and regulations to avert, decrease and control pollution [waste] of the marine environment from land-based sources, including rivers, estuaries, pipelines and outfall structures, considering international agreed rules, standards and recommended practices and procedures*”.¹²¹

“*States shall take other actions as may be essential to avert, reduce and control such waste*”. “*States shall endeavour to harmonise their policies in this connection at the appropriate regional level*”.

“*States, acting through experienced international organisations or diplomatic conference, shall endeavour to establish global and regional rules, standards and recommended practices and procedures to prevent, reduce and control contamination of the maritime environment from land-based sources, considering characteristic regional features, the economic capacity of developing states and their need for economic development*”.¹²²

The above provisions, procedures and values will be scrutinised occasionally as necessary. Practice procedures, measures, regulations, Laws, and recommended practices mentioned in paragraphs 1,2 and 4 will comprise method to reduce, to the highest possible way, the deposit of noxious, harmful substances, particularly with those which are common, to port environment.

¹²⁰ Ibid.

¹²¹ Cardwell, P.J. and French, D., 2007. Who Decides? The ECJ's Judgment on Jurisdiction in the MOX Plant Dispute: Failure of a Member State to fulfil obligations—United Nations Convention on the Law of the Sea—Part XII—Protection and preservation of the marine environment—Dispute-settlement system provided for under that convention—Arbitration proceedings initiated on the basis of that system by Ireland against the United Kingdom—Dispute relating to the MOX plant at Sellafeld (United Kingdom)—Irish Sea—Articles 292 EC and 193 EA.... Journal of Environmental Law, 19(1), pp.121-129.

¹²² International Law Documents - Page 460 - Google Books Result <https://books.google.co.uk/books?id=XsrxDAAAQBAJ&pg=PA460&lpg=PA460&dq=%22pollution+of+the+marine+environment+from+landbased+sources,+taking+into+account+characteristic+regional+features,+the+economic+capacity+of+developing+states+and+their+need+for+economic+development.%22&source=bl&ots=JgXdX3i1U&sig=KPn4lOkvfOrCj7cbFPxotxdPVR8&hl=en&sa=X&ved=0ahUKEwjNsMOh7dnUAhXC.CMAKHTRsD3MQ6AEINTAC#v=onepage&q=%22pollution%20of%20the%20marine%20environment%20from%20landbased%20sources%2C%20taking%20into%20account%20characteristic%20regional%20features%2C%20the%20economic%20capacity%20of%20developing%20states%20and%20their%20need%20or%20economic%20development.%22&f=false> (Assessed on 23 June 2017)

Furthermore, Article 213 postulates that “states have the right to ensure its legislations is enforced and approved in agreement with Article 207 and will approve legislations and procedures by taking reasonable step needed to enforce appropriate international standard and procedure via capable international bodies or diplomatic conference to ensure the reduction, prevention and control ship-generated waste within the port environment from port multifarious activities. States possess authority to establish its own power to extract their natural resources in accord with their legislation on environment policies, and thus under the terms of UNCLOS, to be a beneficiary or to enjoy such a right is connected to the duty to protect and preserve the port environment, especially the port area.¹²³

Within the general values of public international law, the purpose of the regime of international responsibility for environmental damage is the violation of an obligation generates the obligation to repair the damage that occurs.¹²⁴ In the specific area of international environmental law, there is principle that: “States have a obligation to guarantee that their activities or those carried out within their territory or under their control do not trigger pollution beyond their borders, that can affect other State seaport area or in the zones outside State jurisdiction”.¹²⁵

The United Nations Convention on the Law of the Sea of 1982, on its part, states in Article 235: Governments must guarantee that their legislative methods provide resources that allow rapid and requisite compensation or other compensation for damage that emanated from environmental litter of the marine area by natural or legal persons under their territory.¹²⁶ Most of the provisions analysed, contained in international agreements, basically refer to the need to regulate the establishment of standards and procedures related to the responsibility of States and the

¹²³ http://www.un.org/depts/los/convention_agreements/convention_overview_convention.htm (Assessed on 6 March 2018).

¹²⁴ Ibid.

¹²⁵ Kofele-Kale, N., 2016. The international law of responsibility for economic crimes: holding state officials individually liable for acts of fraudulent enrichment. Routledge.

¹²⁶ Gallagher, M.E., 2014. The Time is Now: The United States Needs to Accede to the United Nations Convention on the Law of the Sea to Exert Influence Over the Competing Claims in the South China Sea. *Temp. Int'l & Comp. LJ*, 28, p.1.

consequences of such responsibility¹²⁷. They do not clearly establish the need for repairing environmental damages.

It is unanimously accepted that these issues have encountered special difficulties for their regulation by the international legal order due to the reluctance of the States to accept their international responsibility and the consequences of this. Therefore, Gaines pointed out, the international texts to formulate the principle of responsibility and reparation of the environmental damage.¹²⁸ In general terms, a liability regime for environmental damages should aim to achieve the following objectives:

- Discourage dangerous activities,
- Promote the repair of marine environmental damage due to ineffective port waste management,
- Ensure compensation for economic damages associated with environmental damage from illegal waste disposal at the port,
- Ensure the existence of funds to finance said repair and indemnification activities.

2.2.2 International Convention for the Prevention of Pollution from Ships 73/78

International Convention for the Prevention of Pollution from Ships-Convention MARPOL 73/78 (4), which conceptualises the ship as all types of ship navigating at the port environment, including smoothing ships, as well as hovercrafts, submersibles, moving devices and floating or fixed platforms.¹²⁹ The International Convention on Civil Liability born of damage due to Pollution by Hydrocarbons, 1992 Convention CLC 1992 (5); defines the ship as 'any vessel suitable for maritime navigation and any floating device at sea, of any kind, built or modified for the transport of substance hydrocarbons as shipment.'¹³⁷ When provided that the ship in which oil can be transported is considered as such only when it is effectively transporting oil in bulk as

¹²⁷ Ibid.

¹²⁸ Gaines, S.E., 1990. Taking responsibility for transboundary environmental effects. *Hastings Int'l & Comp. L. Rev.*, 14, p.781.

¹²⁹ Anderson, D., 1998. The roles of flag States, port States, coastal States and international organisations in the enforcement of international rules and standards governing the safety of navigation and the prevention of pollution from ships under the UN convention on the law of the sea and other international agreements. *Sing. J. Int'l & Comp. L.*, 2, p.557. ¹³⁷ Ibid

cargo and during any trip made after that transport unless it is demonstrated that there is no on board residues of the bulk hydrocarbons that are the object of such transport.

The International Convention on the Intervention of the High Seas in the Event of Accidents Witnessing a Pollution by Hydrocarbons- INTERVENTION 1969 (6) defines the ship as any ship suitable for navigation whatever its type, and any floating device except the installations or rigging destined to the exploration and exploitation of resources of the bottom of the seas, oceans and sub-soils¹³⁰. This activity is regulated worldwide through a normative framework that emerges from the International Maritime Organisation (IMO) (7), which is a dedicated agency of the United Nations, which within its activities deals with environmental behaviour, regarding the impact of international maritime transport generated by ships.

This activity is complemented by several International Agreements that generate a technical-legal platform focused on responding to and treating the contaminating impacts that arise from the activities of the vessels themselves. Within the structure of IMO is the Marine Environment Protection Committee (MEPC) composed of the Member States of that organisation, which examines the issues of its competence connected with the stoppage and containment of marine contamination, caused by the ships.¹³¹

The Subcommittee on Prevention and Fight against Pollution (PPR) interacts with this Committee, which held its first session in 2014, reporting its work to this body.¹³² In this session, various topics were discussed, such as;

- The Risk Assessment of Liquid Chemicals from the protection point of view of pollution and preparation of amendments to the International Chemicals Code;

¹³⁰ Zonn, I.S. and Kostianoy, A.G., 2015. Environmental Risks in Production and Transportation of Hydrocarbons in the Caspian–Black Sea Region. In *Oil and Gas Pipelines in the Black-Caspian Seas Region* Springer, Cham. pp. 211-223.

¹³¹ Costa, F.C., Denny, D.M.T., Heckler, G., Zanethi, L.R. and Pereira Soares, W.L., 2016. *Environmental Compliance over Marine Fuels*.

¹³² MacKenzie, S., 2014. Laurentian and African Great Lakes-Different strategies in the fight against Invasive species. *Ind. Int'l & Comp. L. Rev.*, 24, p.93.

- Elaboration of a method for the treatment and transport of limited amounts of Harmful and Potentially Hazardous Bulk Liquid Substances in Sea-side Support ship;¹³³
- Additional guidelines for the enforcement of the International Convention to regulate and manage sediment and ballast water from ships
- Convention BWM 2004 as an approval of new and improved technologies for Ballast Water Management Systems (BWM) and decrease of environmental pollution;¹⁴²
- Examination of the impacts on the Arctic of black carbon discharges from International Maritime Transport, among other interesting approaches that interact between the ship and the sea.

The 1978 Protocol allowed a minimum grace time of three years for Annex II to be implemented from the day of entry into implementation of the MARPOL.¹³⁴ Protocols I and II of 1973, which deal with the reporting of incidents at sea involving harmful substances, and guidelines for dispute resolution respectively, and the annexes contain specific regulations for the management of each category of waste.¹⁴⁴ The Convention only deals with the waste due to usual navigation of ships. The regulations under the MARPOL 73/78 cover reduction of shipboard waste as well as handling of waste when brought ashore and permits some measure of control over waste disposal at sea which will not harm the marine environment.¹³⁵

MARPOL being an international legal instrument that requires documentation of waste shipment from one party nation to another.¹³⁶ Nations that are not signatories to the convention could have their waste shipment deemed illegal and could face legal consequences in the member states to which they travel. The MARPOL 1973, with its revising Protocol of 1978 (MARPOL 73/78), provided both precise and comprehensive international regulations meant to reduce and ban specific types of

¹³³ Ibid. ¹⁴²

Ibid.

¹³⁴ Per H. Olson. Handling of Waste in Port; Marine Pollution Bulletin, Vol. 29, No. 6-12, (1994), pp. 284295. ¹⁴⁴ Ibid.

¹³⁵ De La Fayette, Louise Angélique. "New Approaches for Addressing Damage to the Marine Environment." Int'l J. Marine & Coastal L. 20 (2005), pp.167.

¹³⁶ Ibid.

ship-generated waste on a global scale.¹³⁷ The unified Convention and Protocol aims to control marine waste via six annexes that as summarised in Table 2.1 (Appendix 1).

Annexes I and II are compulsory, and countries approving or complying with MARPOL 73/78 are expected to also apply the legislation to all ships within their territorial waterway. This also requires that all ships must fly their flag regardless of where they may go. The rest of the Annexes seem voluntary, nevertheless till date, they are still operational excluding Annex IV, which have been applied at the regional level.¹³⁸ For instance, ships hovering the flag of member states to the Helsinki Convention are expected to comply with the provisions of Annex IV in the Baltic Sea. On the other hand, States member of the Helsinki Convention is also requested to encourage ship hovering their flag to implement the provisions of Annex IV in that area.¹³⁹

Thus, the capacity to conform with the dumping of waste requirements outlined in the MARPOL 73/78 hinge on the accessibility of effective port waste reception facilities. Consequently, in addition to the standards created for connecting to types and sizes of wastes legally dump, MARPOL 73/78 required States that are parties to the Convention to make sure, waste reception facilities are available to be used at the port.¹⁴⁰ It is the duty of the individual State to the agreement to enforce the dictate and the requirements of MARPOL 73/78 when approved, and how this duty is complimented might be differs from individual State. Most wastes, especially like sewage and garbage, are treated as domestic waste and can be treated by local disposal methods.¹⁴¹

The remain category of wastes, mostly Annex I and II, are essentially classified as hazardous waste in view of their toxic nature, flammability, and other chemical

¹³⁷ Jagdeep S, Rafael L., Rajib S. and B. Frostell. Progress and Challenges to the Global Waste Management System; Waste Management & Research, vol. 32(9) (2014) pp. 800-812.

¹³⁸ Nickie Butt. The impact of Cruise Ship Generated Waste on Home Ports and Ports of Call: A Study of Southampton. Marine policy 31 (2007), pp. 591-598.

¹³⁹ Ball, I., 1999. Port Waste Reception Facilities in UK ports Iwan Ball. Marine Policy, 23(4-5), pp.307327.

¹⁴⁰ Ibid.

¹⁴¹ Wooldridge, C.F., McMullen, C. and Howe, V., 1999. Environmental Management of Ports and Harbours Implementation of Policy through Scientific Monitoring. Marine Policy, 23(4-5), pp.413-425.

properties, which means that their disposal highly demanding. MARPOL Annex III rules deals with the preclusion of harmful pollution materials carried in packaged methods by sea, portable tanks, in containers freight, or road and tank wagons rail. They are not expected to use waste reception facilities, because waste through these method of transportation does not normally produce any waste that is expected to be discharged at the port.¹⁴²

However, in situation that the packaging is broken and its content leaking, reception facilities are essential expected as provided by Annex VI. Worthy of note is that such waste and damaged materials require sophisticated guards to avert pollution.¹⁴³ The argument has centred on if such cargo waste should be classified as garbage. In view of this, MARPOL 73/78 clearly states that cargo waste must be classified as garbage as outlined in Annex V. The only exception is when such wastes are materials highlighted in view of the other Annexes to the Convention. There is also an intrinsic perspective that cargo waste will not be considered in huge amounts, because Annex IV is yet to be fully operational. Presently, no legal responsibility requires terminal, port, and harbour operator to offer reception facilities for sewage, though, it is predictable that Annex IV will be compulsory for member states in few years to come.¹⁴⁴

2.2.2.1 Implementation and Enforcement of MARPOL

The implementation and enforcement of MARPOL is in the hand of governments of member states, some of which have the means to ensure that the regulations are being strictly followed.¹⁴⁵ Although, Article II (I)(e) of the MARPOL Convention wants member states to give reports about the application of the convention to the IMO. In a special circular letter (MEPC/Circ.138), IMO came up with special templates for these reports, which consist of eight different sections.¹⁴⁶ Despite these efforts, only six contracting parties have attempted to submit reports annually since the MARPOL

¹⁴² Ibid n 39.

¹⁴³ Ng, A.K. and Song, S., 2010. The Environmental Impacts of Pollutants Generated by Routine Shipping Operations on Ports. *Ocean & Coastal Management*, 53(5), pp.301-311.

¹⁴⁴ Ibid.

¹⁴⁵ Becker, R., 1997. MARPOL 73/78: An Overview in International Environmental Enforcement. *Geo. Int'l Envtl. L. Rev.*, 10, p.625.

¹⁴⁶ Article II(I)(e) of the MARPOL Convention

became effective. Example of these countries are, Denmark, Netherlands and of course the United Kingdom who deserves some special commendation because the UK has been submitting reports every year to IMO in compliance with the above guidelines.¹⁴⁷

However, more than thirty contracting parties seems not to have ever submitted reports to IMO, though some other parties to the contract have submitted reports for some years. Nonetheless, there may be various reasons for this.¹⁴⁸ It might be possible that they had no information from which to generate their reports when no discharges were recorded and none of the ships flying the flag of the member countries have been involved in any form of illegal dumping of wastes.¹⁴⁹ It seems logical not send any reports in the event of no discharges, but for the evaluation of the effectiveness of the MARPOL Convention, it is becomes extremely important that as a way of monitoring trends. Therefore, even if there is no detection of (alleged) discharges, reports can still be submitted to the IMO.¹⁵⁰

In general, it appears that MARPOL provisions have not been copiously obeyed by the parties involved. Interestingly, one of the major shortcomings of this Convention is how to determine the jurisdiction and authority of state to conduct investigation and subsequently prosecute violation of such pollution, between the port state, the flag state, and the coastal state. To clarify this, the United Nations Convention on the Law of the Sea (UNCLOS) classified the powers and responsibilities of these states to guard the port environment.¹⁵¹¹⁵²

2.2.2.2 Flag State Jurisdiction

Flag state jurisdiction formed the important underpinning for the law of the sea. Individual state is expected to make sure that ship hoist its flag comply with the

¹⁴⁷ Ibid.

¹⁴⁸ Peet, G., 1992. The MARPOL Convention: Implementation and Effectiveness. *Int'l J. Estuarine & Coastal L.*, 7, p.277.

¹⁴⁹ Payoyo, P.B., 1994. Implementation of international Conventions Through Port State Control: An Assessment. *Marine Policy*, 18(5), pp.379-392.

¹⁵⁰ Knudsen, O.F. and Hassler, B., 2011. IMO legislation and its Implementation: Accident Risk, Vessel Deficiencies and National Administrative Practices. *Marine Policy*, 35(2), pp.201-207.

¹⁵¹ United Nations Convention on the Law of the Sea, art. 237, U.N. Doc. A/Conf.62/22 (1982), reprinted in

¹⁵² I.L.M. 1261 (1982) [hereinafter UNCLOS].

acceptable international legal frameworks and standards.¹⁵³ Flag states are expected to give certificate of seaworthiness in line with MARPOL directives. Port and coastal states primary response to a ship's detected pollution violations is to update the ship's flag state of the contradiction. Usually, flag states might be reluctant to prosecute ship that fly their flags.

An additional challenge in enforcing authority of the flag state may occur with nations that provide flags of convenience. A country that has no control or administrative machinery to effectively manage any state or international rules can grant flags of convenience.¹⁵⁴ Such nation can offer less rigorous implementation of environmental regulations to boost profit from measures such as extra tax revenue generated by ships that are registered under their individual flags.¹⁵⁵ Ship owners also reap the economic benefit of lesser labour taxes, lower international tax rates and stress-free safety standards.¹⁵⁶ Due to the importance of flag state jurisdiction, this certainly leads to mark reduction in the value of ecological compliance appraisals and investigations.¹⁵⁶

2.2.2.3 Port State Jurisdiction

Port state jurisdiction allows a state to undertake investigations of ship within its ports. MARPOL permits port state inspections to the extent that identified violations can adequately be tried by the port state or notified the flag state.¹⁵⁷ When notified the flag state, the state has the responsibility to use its discretion to try the violation. This sits broadly sits as one of the many problems affecting the enforcement of MARPOL, because the country prosecuting the case pays all legal expenses. Therefore, most port state identified violations are reported to the flag states for action. An analysis conducted by AID Environment, Amsterdam, presented to the IMO in January 1992 confirms that during the period, 1335 violations were reported by port states. Of these,

¹⁵³ Art. 217(I).

¹⁵⁴ Curtis, J.B., 1984. Vessel-Source Oil Pollution and MARPOL 73/78: An International Success Story. *Envtl. L.*, 15, p.679.

¹⁵⁵ Boos, M.L., 1991. The Oil Pollution Act of 1990: Striking the Flags of Convenience. *Colo. J. Int'l Env'tl. L. & Pol'y*, 2, p.407. ¹⁵⁶ Ibid.

¹⁵⁶ Becker, R., 1997. MARPOL 73/78: An Overview in International Environmental Enforcement. *Geo. Int'l Env'tl. L. Rev.*, 10, p.625.

¹⁵⁷ Downes, D.R., Dellapenna, J., Ditthavong, K., Freedman, J., Gardner, R.C., Gravalles, D.M., Horsch, R.A., Hunter, D., Klein, J.M., Redick, T.P. and Thorson, E., 2009. *International Environmental Law. The International Lawyer*, pp.837-860.

238 violations were handled by the port states and 1078 were directed to the flag states for resolution.¹⁵⁸

MARPOL expects flag states to inform the port state and the IMO of any step taken from the violation complained by a port state.¹⁵⁹ However, evidence shows that from numbers of 1000 cases of violations that were complained to the IMO, only 534 out of the cases failed the notification requirements expected from the flag states. Also, out of 206 cases, 111 were found to be innocent ship or non-prosecutable due to lack of substantial evidence. While 77 of such cases led to fines, 8 of them ended with only warnings, however 10 resulted in indefinite actions.¹⁶⁰

The system mandates a port state to use control officials to:¹⁶¹ check the validity of the certificate carried by ships in compliance with the law; detain such ships in situation wherever ships carried an expired certificates or failed to show any certificate; examine both the working and living conditions of such ships;¹⁷² as well as carry out intermittent surveys of ship management systems for monitoring purposes. Adequate provisions on procedures for extermination, and communication of detention to the state and recognised organisations are likewise needed.¹⁷³

Nevertheless, justification of detention, especially if the ship is found to be of low standard and poses great danger to the marine environment.¹⁷⁴ The IMO PSC procedures and guidelines for identifying a substandard ship have been adapted by the various PSCs are as follows:¹⁷⁵

- The lack of compulsory principal arrangement or equipment.
- Nonconformity of arrangement or equipment with appropriate specifications
- Significant weakening of its equipment or the ship.

¹⁵⁸ Becker, R., 1997. MARPOL 73/78: An Overview in International Environmental Enforcement. *Geo. Int'l Env'tl. L. Rev.*, 10, p.625.

¹⁵⁹ Ibid.

¹⁶⁰ Koetse, M.J. and Rietveld, P., 2009. The impact of climate change and weather on transport: An overview of empirical findings. *Transportation Research Part D: Transport and Environment*, 14(3), pp.205-221.

¹⁶¹ Guidelines for port State control officers carrying out inspections under the Maritime Labour Convention, 2006 <http://www.ics-shipping.org/docs/default-source/ILO-MLC-docs/ilo-guidelines-forport-state-control-officers-inspecting-under-the-mlc.pdf?sfvrsn=2> See also, List of Certificates And

- Inadequate operational expertise or crew nonfamiliarity with the crucial operational guidelines.
- Inadequacy of manning or deficiency of certification of seafarers.
- Nonconformity with relevant manning standards or operational guidelines.

Wherever these factors occur all together or independently, they render the ship 'unseaworthy' and position the ship at danger to the lives of crew on-board. It also present hazard to the marine environment if it could proceed to ocean, and such ship can be classified as substandard and it may constitute environment hazard to port.¹⁷⁶

2.2.2.4 Coastal State Jurisdiction

Both MARPOL and the London Convention require coastal states either to enforce their law against all ships in the territorial sea or to furnish evidence to the ship that a violation has occurred.¹⁶² The London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters 1972 thus provides, in Article 10, is in agreement with the provisions of international law connecting to the duty of States for hazard caused to the other States environment.¹⁶³ It includes other part of the port by the discharge of waste and related materials of any kind, the member states agree to advance guidelines for the determination of responsibilities and the resolution of any disputes relating to dumping operations.

The parties to the said agreement were obliged only to develop procedures for the evaluation of liability, without specifying anything in relation to the consequences of such responsibility. In this same sense, the Protection of the Marine Environment Convention in the Baltic Sea Area, establishes in article 17 that the member states assume, as realistic as possible, to mutually advance and agree on the guidelines relating to liability for injury due to acts or errors in infringement of this convention.¹⁶⁴

¹⁶² Bloor, M.J., Baker, S.C. and Sampson, H., 2012. Effectiveness of International Regulation of Pollution Controls: The Case of the Governance of Ship Emissions-Interim Report.pp.235-345.

¹⁶³ Ibid.

¹⁶⁴ Vuorinen, I., Hänninen, J., Rajasilta, M., Laine, P., Eklund, J., Montesino-Pouzols, F., Corona, F., Junker, K., Meier, H.M. and Dippner, J.W., 2015. Scenario simulations of future salinity and ecological consequences in the Baltic Sea and adjacent North Sea areas—implications for environmental monitoring. *Ecological indicators*, 50, pp.196-205.

It includes limits to liability, standards and measures for determining accountability and remedies accessible.

The Nairobi the Protection, Management and Development of the Marine and Coastal Environment Convention for the East African Region 21 in its article 15, follows the same line by noting that the contracting parties will cooperate directly, or in cooperation with competent regional or international organisations.¹⁶⁵ It is for the purpose of developing and adopting suitable guidelines and measures that are in accordance with international legal regulation, in the field of damage compensation due to liability resulting from inadequate port waste management.

2.2.3 The International Convention for the Prevention of Pollution of the Sea by Oil

Pollution of maritime environment was appropriately documented by the International Convention for the Prevention of Pollution of the Sea by Oil, 1954 (OILPOL 1954). The Convention was adopted in a conference organised by the UK Government. The outcome of the conference called on IMO to undertake certain drastic actions when it was established.¹⁶⁶ Indeed, the OILPOL Convention agreed that most pollution from oil come from daily-routine shipboard operations, for example, cargo tanks cleaning at the port. Prior to the early 1951, the dominant procedure was merely to clean the tanks with water and then residue of water and oil would be into the ocean.¹⁶⁷

OILPOL 54 restricted the dumping or discharging of oily wastes within some distance, especially in designated zones where the danger of such action to the zone was remarkably acute. The limits were extended in 1962 through an amendment adopted at an IMO conference. In fact, 1965, IMO set up a Subcommittee on Oil Pollution. This was overseen by its Maritime Safety committee dealing with oil pollution issues within maritime environment.¹⁶⁸

¹⁶⁵ Kern, J.M., 2016. Wreck Removal and the Nairobi Convention—a Movement Toward a Unified Framework. *Frontiers in Marine Science*, 3, p.11.

¹⁶⁶ Mitchell, R.B., 1994. Regime design matters: intentional oil pollution and treaty compliance. *International organization*, 48(3), pp.425-458.

¹⁶⁷ Mason, M., 2003. Civil liability for oil pollution damage: examining the evolving scope for environmental compensation in the international regime. *Marine Policy*, 27(1), pp.1-12.

¹⁶⁸ Weiss, E.B., 1992. *International Environmental Law: Contemporary Issues and the Emergence of a New World Order*. *Geo. LJ*, 81, p.675.

Both the UK and Nigeria are signatory to the implementation of the convention against oil pollution. However, the International Convention for the Prevention of Pollution from Ships, 1973, as amended by the Protocol of 1978 relating thereto has adopted the OILPOL 1954 and its subsequent modifications into Annex I. This covers oil, while other annexes focused on debris, substances, sewage and other hazardous materials in wrapped form. The Annex I not only extended, but also enhanced on OILPOL in different ways. It detailed some basic procedure for the non-stop monitoring of oily water residues, including Government's role in providing treatment reception facilities at the port.

Nevertheless, the control, and reduction of marine waste has become one of the key issues in modern law of the sea even though it has proved to be significant. It speaks to the establishment of a recent as well as the growing body of international law. Though incomplete, in certain respects, this process has reached its potentially most significant phase of development through the requirements of the Law. Conversely, the convention remains the major International Maritime Organization (IMO) which Nigeria has ratified and its provisions substantially form part of Nigeria's Oil in Navigable Water Act 1962.¹⁶⁹ The Environmental Impact Assessment (EIA) Act No 86 of 1992 is an examination in which the possible physical, organic, monetary as well as social impacts of a planned improvement venture on the quick and furthermore the inaccessible condition is distinguished, dissected and anticipated.¹⁷⁰ This Act guarantees that noteworthy ecological effects (whether unfavourable or ideal) are attractively evaluated and considered in the arranging, plan authorisation and usage of every real kind of advancement ventures.¹⁷¹ It lessens unsatisfactory effects and gives choices or choices in the plan, area and activity of the proposed advancement. The Nigeria Federal Ministry of the Environment implements this Act.

¹⁶⁹ Akpan, W., 2005. Putting oil first? Some ethnographic aspects of petroleum-related land use controversies in Nigeria. *African Sociological Review/Revue Africaine de Sociologie*, 9(2), pp.134-152.

¹⁷⁰ Nwilo, P.C. and Badejo, O.T., 2006. Impacts and management of oil spill pollution along the Nigerian coastal areas. *Administering Marine Spaces: International Issues*, 119, pp.1-15.

¹⁷¹ Olokesusi, F., 1998. Legal and institutional framework of environmental impact assessment in Nigeria: an initial assessment. *Environmental Impact Assessment Review*, 18(2), pp.159-174.

2.3 Regional Legal Regulatory Frameworks on Port Waste Management in the UK and Nigeria

In April 2004, the Environmental Liability Directive in relation to the Repair of Environmental Damages and Prevention was approved in Europe.¹⁷² It states that the rehabilitation of the environment must be carried out effectively, so that all the objectives are met. For this, the directive recognises that it is required to define a general framework for this purpose, whose correct application must be supervised by the competent authority. It is also pointed out that appropriate provisions should be established for situations in which there have been several cases of environmental damage, which prevent the competent authority from ensuring that all the essential corrective procedures are adopted at the same time.

However, in situations where the port wastes or the threat derives from the actions that are out of control of the operator, it is not the responsibility of the operator to perform the repairing measures. This draws attention to the mutual responsibility of the environment; therefore, States should guarantee that non-governmental organisations whose purpose is to promote the protection of the environment could contribute effectively.

It is also stated that States should take measures to encourage operators to use insurance or alternative methods of financial guarantee or encourage the advancement of fiscal methods in order to effectively protect the economic obligations that it demands. The 3rd and 4th items of the directive specify the scope of application and its exceptions, indicating the cases to which its provisions will apply and those in which they are not applicable.¹⁷³ Article 6 refers specifically to the reparative action that must be carried out when port wastes lead to environmental damage. The first requirement included in this article refers to the rapid transfer of information to the competent authority about the port wastes in order to adopt appropriate measures to limit or prevent the environmental damage from the port wastes and remedial measures.

¹⁷² Fasoli, E., 2017. The Possibilities for Nongovernmental Organisations Promoting Environmental Protection to Claim Damages in Relation to the Environment in France, Italy, the Netherlands and Portugal. *Review of European, Comparative & International Environmental Law*, 26(1), pp.30-37.

¹⁷³ Ibid.

They must be defined by the operators that have caused the damage and submitted for approval by the competent authority, which will decide which should be applied according to the criteria of Annex II.¹⁷⁴ The criterion contemplates different reparative measures including the primary, complementary and compensatory measures. The basic repair is any arrangement that quantifies that restores or approximates the natural resources and or damaged area to its basic condition. The complementary repair consists of the measures that are adopted to reward for what the main repair has not restored. Compensatory reparation refers to the actions taken to recompense for the provisional losses of natural resources that take place as the impact occurred when the primary repair has taken effect.

Regarding the allocation of the costs of prevention and repair of environmental damage, it will be the operator who carries them. In the first case, that is, in the case of prevention and control costs, due to the polluter pays principle, the potential polluter must cover them.¹⁷⁵ In the second case, repair costs will also fall on the originator, but not because of the polluter-pays principle. Since, the directives point out, this principle refers to the control and prevention of pollution so that the repair of damage to the environment would go beyond the mentioned principle. However, because of another principle, which refers to "anyone who causes damage to another has the obligation to repair it."¹⁷⁶

Article 15 refers to cooperation between member states in the case of environmental damage that affects or may affect several countries in order to repair said damage.¹⁷⁷ Much emphasis is placed on the exchange of information so that the affected States can react immediately. Although, this directive contains detailed provisions aimed at ensuring the effective compensation of environmental damage, States may adopt stricter national standards.

¹⁷⁴ Barker, A. and Wood, C., 1999. An evaluation of EIA system performance in eight EU countries. *Environmental Impact Assessment Review*, 19(4), pp.387-404.

¹⁷⁵ Ibid.

¹⁷⁶ DIRECTIVE, H.A.T., 1997. THE COUNCIL OF THE EUROPEAN UNION, having regard to the Treaty establishing the European Community, and in particular Article 130s (1) thereof, having regard to the proposal from the Commission (1), Having regard to the opinion of the Economic and Social Committee (2), Acting in accordance with the procedure laid down in Article 189c of the Treaty (3). *Official Journal L*, 10(14/01), pp.0013-0033.

¹⁷⁷ Tilman, D., 2000. Causes, consequences and ethics of biodiversity. *Nature*, 405(6783), p.208.

2.3.1 EU Directive 2000/59/EC

Operational and ship-generated waste is considered as one of the sources of waste at the port environment.¹⁷⁸ Serious economic and ecological damage results from such waste. Recognising the role of shipping and the inadequacies waste delivery procedures, the European Union adopted policy on Port Reception Facilities (EU Directive 2000/59/EC).¹⁹⁴ Mandatory transfer of waste to port and funding its cost indirectly are important part of the Directive in order to encourage and implement adequate waste disposal at the port.¹⁷⁹ The EU Directive was adopted on 27 November 2000 and member states were mandatory to ensure the legislation is enforceable and implemented by 28 December 2002.¹⁸⁰ It chases the same objective as the MARPOL 73/78 on the prevention of waste from ships, by EU Member States have to comply with.¹⁸¹ Therefore, the Directive is geared towards the implementation of port waste management, which in details, focus on the financial, legislative measure and duties of the waste delivery capacity at ports in MARPOL.¹⁸²

One essential elements of this Directive under Article 4 (1) (2) (3) is for ports to make available waste reception facilities for wastes generated from ships and cargos. This also extends to developing waste controlling, handling and reception strategies across different ports for the treatment and reception of ship's waste.¹⁸³ Consequently, Article 4(3), provided that "member States will create measures, in line with those accepted by the International Maritime Organisation (IMO), for reportage to the port state of an suspected insufficiencies of port reception facilities". Thus, Articles 5, 6, 7, and 8 of the Directive sets out some objectives on reception facilities for ship-generated waste to give further compliance to the provision of MARPOL 73/78, especially in protecting

¹⁷⁸ Carpenter, A. and Macgill, S.M., 2005. The EU Directive on Port Reception Facilities for Ship Generated Waste and Cargo Residues: The Results of a Second Survey on the Provision and Uptake of Facilities in North Sea ports. *Marine Pollution Bulletin*, 50(12), pp.1541-1547. ¹⁹⁴ Directive 2000/59/EC.

¹⁷⁹ Ibid.

¹⁸⁰ Cole, M., Lindeque, P., Halsband, C. and Galloway, T.S., 2011. Microplastics as Contaminants in the Marine Environment: A Review. *Marine Pollution Bulletin*, 62(12), pp.2588-2597.

¹⁸¹ MARPOL 73/78 Convention.

¹⁸² Psaraftis, H.N., 2005. EU Ports Policy: Where Do We Go from Here? *Maritime Economics & Logistics*, 7(1), pp.73-82.

¹⁸³ Peter W. D and Michael N. Nijdam. 2008 Charging System for Waste Reception Facilities in Port and the Level Playing Field: A Case from North-West Europe. *Coastal Management*, Vol. 36 pp. 109-124.

the port waste management. To further buttress this argument, Article 10 of the Directive states that operator of a ship intends to use the any member state waste reception facilities will comply with the MARPOL 73/78. Any mandatory payment for waste transfer and the use of such facilities shall be paid for the usage of such reception facility”.

The Directive highlights the following:

- Each member state port would have a waste management and handling methods. Methods would be examined and surveyed by the member state and endorsed at regular intervals;
- Each member state port shall make it a point of responsibility to ensure UpToDate waste receptions facilities is available for ships frequently coming to its port. Part States must guarantee that port waste reception facilities do not cause delay to ship during waste discharge at the port. These services must be personalised to the capacity of the port and to the classes of ship coming into the port;¹⁸⁴
- The Directive makes it compulsory for ship coming into the port to dispose of its waste, except such ship has enough storage capacity for waste to be disposed at a subsequent port;
- Ports must create charge retrieval schemes to boost the distribution of waste and discourage dumping of waste at sea.¹⁸⁵ The charge must be clear, non-discriminatory, fair, and justify the fees for the service and the facilities.

¹⁸⁴ Directives for Ports - Welcome to EuTravel

<http://www.eutrapelproject.eu/default.aspx?articleID=7586> (Assessed on 23, June 2017) see also, Erjola K. and Osman M. Ship-Generated Waste and Cargo Residues Institutional Framework and Management in Albania.

<http://www.mcser.org/ichss2016/images/poster2016/Erjola%20Keci%20ICHSS%202016%20%20FUL%20PAPER%20-%20POSTER.pdf> (Assessed on 23, June 2017).

¹⁸⁵ Ala Iarnaca port Environmental Impact Assessment Report - SlideShare

<https://www.slideshare.net/AndyIoannouVaroshiotis/ala-larnaca-port-environmental-impactasseseement-report> (Assessed on 23, June 2017). See also, Environmental Protection and Management Of Sea-Ports. The Case of Volos Sea-Port

<https://www.scribd.com/document/309482570/Environmental-Protection-and-Management-of-VolosSea-port> (Assessed on 23, June 2017).

- Ships may be inspected, and the category of such inspection will concentrate mostly on ships which have not obeyed the condition for notification waste disposal and those suspected of having failed to deliver their waste.

2.3.1.1 Implementation and Enforcement of the EU Directive 2000/59/EC

The EU Directive 2000/59/EC sets out how it will be enforced among the 28 member states under article 11(1) "member states shall ensure that any ship may be subject to an inspection in order to verify that it complies with articles 7 and 10 and that a sufficient number of such inspections is carried out".¹⁸⁶ It has been applied since 2000, and EU countries had to incorporate it into their national law by 2002.

The development execution of waste management strategies at ports and other coastal areas present the most efficient plans of ameliorating and dodging the possible effects of operational and unlawful dumping of garbage and oil from ships into the port environment.¹⁸⁷ For instance, in the UK to date, some noteworthy directives have been implemented to reduce port waste management by giving effect to the various legal frameworks on waste management.¹⁸⁸ As the shipping business grows in the UK due to several implications, the quantity and variation of wastes generated at the port increases accordingly. This suggests that the management of waste at the port supposed to be handled in systematic and integrated ways. This will not only boost port safety or a feasible economic infrastructure, but also promote an suitable operational strategy as provided by international requirements.¹⁸⁹

The development of maritime law on port waste management is often interpreted as an expression of unilateralism or regionalism, as opposed to the "universal action" which is conventionally represented by the IMO.¹⁹⁰ Thus, the interpretation of the term "unilateralism" is not an easy task, although the EU does not contemplate its actions

¹⁸⁶ EU Directive 2000/59/EC Article 11(1).

¹⁸⁷ Ulnikovic, V.P., Vukic, M. and Nikolic, R., 2012. Assessment of Vessel-Generated Waste Quantities on the Inland Waterways of the Republic of Serbia. *Journal of Environmental Management*, 97, pp.97101.

¹⁸⁸ Smith, H.D. and Lalwani, C.S., 1999. The Call of the Sea: The Marine Knowledge Industry in the UK. *Marine Policy*, 23(4-5), pp.397-412.

¹⁸⁹ John D and Sarah T., 2012 Sustainable Development of Maritime Operations in Ports. *Business Strategy and the Environment*, 21, pp. 111-126.

¹⁹⁰ Ibid.

to be unilateral since they are shaped according to international requirements and tend to anticipate future international action. Despite possible controversy about the meaning of unilateralism, therefore, the EU has not been prevented from developing a substantial legislative policy on port waste management and marine environmental protection. Some of the efforts of ports within the EU's include measures on port state control, cargo residues and ship-generated waste reception facilities at the port, ship traffic control and information systems, and the introduction of penalties in case of ship source pollution.¹⁹¹

However, in the event of final phase of Brexit by the UK Government, the most significant UK legal framework that may need to be revoked is the European Communities Act 1972 (ECA) which recognises the authority of EU law.¹⁹² When ECA is revoked, it will put an end to the legal connection between the UK and EU legal instrument. The UK Government might trigger a 'Great Repeal Bill' to repeal ECA. This will translate all EU-derived laws into domestic laws, thereby allowing the UK the freedom to decide over time what laws it would retain. This approach would clear some doubt on the significant gaps and uncertainties that would occur if all EU-derived law was repealed without replacement.¹⁹³

The EU Directives on port waste management discussed in this thesis might be annexed into the UK law with a view to having effect or force of the law. This might create the task for the UK Government in the nearest future to decide whether to start the procedure of reviewing Acts of Parliament and other statutory legislation aimed at ascertaining whether to maintain, replace or repeal any legislation.¹⁹⁴ The Great Repeal Bill would affirm the position of all UK legislations approved pursuant to EU Directives, or to amend the EU-derived laws from legislation. However, many of this legislation might require amendment to consider the new relationship with the EU,

¹⁹¹ Dimitrios A.G., 2007 The Use of the Deposit-Refund Framework in Port Reception Facilities Charging Systems. *Marine Pollution Bulletin*, 54, pp. 508-520.

¹⁹² <http://researchbriefings.files.parliament.uk/documents/CBP-7943/CBP-7943.pdf> (accessed on 02/02.2018).

¹⁹³ <http://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-7943> (accessed on 02/02.2018).

¹⁹⁴ <http://www.geldards.com/what's-the-current-relationship-between-eu-and-uk-law.aspx> (accessed on 02/02.2018).

based on development in port waste management such as the oversight and appointment of new UK watchdogs to replace the EU establishments.¹⁹⁵

2.3.2 Regional Memorandum of Understanding of Post State Control

The management of waste within the port cannot be over emphasised due to activities and increase in substandard ship navigating the oceans of the world.¹⁹⁶ Thus, it has led to of various disaster witnessed in port due to oil tanker such as the Exxon Valdez.¹⁹⁷ In response to ports demand to create a regional collaborative approach to boost port states to further improve enforcement of port pollution and ship safety laws against visiting ship for proper investigation according to the guideline of the MOUs in view of waste management and other safety percussions.¹⁹⁸

The response resulted to the implementation of regional initiatives for port state control. The initial regional initiative for port states was established in Europe via the 1982 MOU on Port State Control in the enforcement of initiatives on Maritime Safety and Protection of the Marine Environment(MSPME), also refer to as Paris Port State Control MOU.¹⁹⁹ This was subsequently followed by the 1992 Latin American Agreement on Port State Control, before the 1993 Tokyo Port State Control MOU, and the West and Central African and East Africa MOU etc.²⁰⁰ Thus, it could be argued that most port state control initiatives are essentially analogous and modelled the 1982 Paris Port State Control MOU. For instance, a cursory look at the port state control MOUs indicates that they comprise similar expression in the introduction which specifies the necessity for a regional method to stop the operation of substandard ships to minimise unhealthy rivalry between ports.²⁰¹

¹⁹⁵ <http://www.nortonrosefulbright.com/knowledge/publications/136975/brexit-uk-and-eu-legalframework> (accessed on 02/02.2018).

¹⁹⁶ Hassler, B., 2011. Accidental versus operational oil spills from shipping in the Baltic Sea: risk governance and management strategies. *AMBIO: A Journal of the Human Environment*, 40(2), pp.170-178.

¹⁹⁷ Keselj, T., 1999. Port State jurisdiction in respect of pollution from ships: the 1982 United Nations convention on the law of the sea and the memoranda of understanding. *ocean development & international law*, 30(2), pp.127-160.

¹⁹⁸ Ibid.

¹⁹⁹ Ademuni-Odeke, 1997. Port state control and UK law. *J. Mar. L. & Com.*, 28, p.657.

²⁰⁰ Molenaar, E.J., 2007. Port State Jurisdiction: Toward Comprehensive, Mandatory and Global Coverage. *Ocean Development & International Law*, 38(1-2), pp.225-257.

²⁰¹ Wright, A.N., 2007. Beyond the Sea and Spector: Reconciling Port and Flag State Control Over Cruise Ship Onboard Environmental Procedures and Policies. *Duke Env'tl. L. & Pol'y F.*, 18, p.215. ²¹⁸

All the regional port state control MOUs enjoin the relevant national port authorities to check visiting ship to enhance compliance and ensure that it is operated, equipped crewed in accordance with the procedures set aside by the relevant international conventions such as the MARPOL for waste management, Basel 1989 and Bamako 1991 for prevention of movement of hazardous waste from port to port.²¹⁸ When ships failed to comply with the standards, the host state may seize the offending ship, and thus prevent it from leaving until they are satisfied that such faults have been cured.²⁰² The aim is to ensure that most nations approve port state control, implementation of international ships procedures in view to ensuring that shipowners undertake to conform with those procedures without any force and thus minimise the risk detection of unseaworthy ship that will cause possible interruptions and penalties.²⁰³

The wider scale of port state control is a plan to advance an opposing view to the competitive affiliation of port in the same location. Port state control has as its strong root and function in ethical teamwork amongst regional ports.²⁰⁴ This has been its major goals in cleaner seas and safer ships, and is built upon the view that same procedure apply to ship visiting its region .²²² Whenever ports agreed to enforce same procedure in same way, then it will be difficult for a single port to take advantage of other port by offering to overlook substandard ship.²⁰⁵

The crux of port state control is the effective implementation of its national legislations to ship coming its port.²⁰⁶ It is worthy of note that, voluntary entering of international ports and other national waters, ship has subjected themselves willingly to national sovereignty of the coastal state.²⁰⁷ Port is an integral fragment of nation's interior waters upon which a nation can administer its power and exercise authority as if the

McDorman, T.L., 2000. Regional Port State Control Agreements: Some Issues of International Law. *Ocean & Coastal LJ*, 5, p.207.

²⁰² Herbst, J., 2014. *States and Power in Africa: Comparative Lessons in Authority and Control*. Princeton University Press, p.56.

²⁰³ Ibid.

²⁰⁴ Churchill, R.R. and Lowe, A.V., 1999. *The Law of the Sea*. Manchester University Press. ²²² Li, K.X. and Zheng, H., 2008. Enforcement of law by the Port State Control (PSC). *Maritime Policy & Management*, 35(1), pp.61-71.

²⁰⁵ Ibid.

²⁰⁶ <https://digitalcommons.maine.gov/cgi/viewcontent.cgi?article=1242&context=oclj> (Assessed on 9 March 2018).

²⁰⁷ Butt, N., 2007. The impact of cruise ship generated waste on home ports and ports of call: A study of Southampton. *Marine Policy*, 31(5), pp.591-598.

interior waters were part of the state land. A ship from other country port is subject to similar jurisdiction like an stranger in the region.²⁰⁸ Thus, the principle of international law on the law of the sea is that, the host nation port possess absolute authority over coming ship in the like manner as if they were a citizen of another country doing business or vacationing in the host nation port.²⁰⁹ The implication of the above is that, ship visiting must comply and obey the legal guidelines of the host nation.²¹⁰ There are, though, quite a few limitations. The initial one is that, if the coming ship is a government one, a situation of diplomatic or sovereign immunity may come up for determination. The second situation, would be if a ship did not enter willingly to the port but due urgency occasion bad climate, there might be a restraint in international law on the power of the port state concerning the ship.²²⁹

The aim of port state control at the regional level appears to be that individual examining authority will apply a general set of procedures as enshrined in the selected international agreements like MARPOL as it affects port waste management and other guidelines set by the MOUs. This shall be succinctly summarised as follows;²¹¹

In summary, the most effective regional MOUs, the Tokyo and Paris MOUs, seems to have a considerate percentage of economically robust nations, cover mostly travelled ships zones, which had witness pollution from ship tragedies, and in return they have carefully initiated the regional PSC MOUs.²¹² Therefore, most texts of the several MOUs are nearly similar (most MOUs seems all based on the first Paris MOU). The parties to MOUs in some counties might lack the structure, expertise, access to fund, and action initiative and guidelines essential for the adequate implementation of the regional MOUs.²¹³ Regularly the decision of a regional PSC MOU was encouraged

²⁰⁸ McDorman, T.L., 2000. Regional port state control agreements: some issues of international law. *Ocean & Coastal LJ*, 5, p.207.

²⁰⁹ McDorman, T.L., 1997. Port State enforcement: a comment on article 218 of the 1982 law of the sea convention. *J. Mar. L. & Com.*, 28, p.305.

²¹⁰ Oxman, B.H., 1988. Jurisdiction of states. In *Encyclopedia of Disputes Installment 10* (pp. 277-283).

²²⁹ Churchill, R.R. And Lowe, A.V., 1999. *The Law of The Sea*. Manchester University Press. Pp.178280.

²¹¹ Molenaar, E.J., 2007. Port state jurisdiction: toward comprehensive, mandatory and global coverage. *Ocean Development & International Law*, 38(1-2), pp.225-257.

²¹² Bang, H.S. and Jang, D.J., 2012. Recent developments in regional memorandums of understanding on port state control. *Ocean Development & International Law*, 43(2), pp.170-187.

²¹³ http://www.rif.mer.developpement-durable.gouv.fr/IMG/pdf/ICS_12_02_-_Annex_-_Flag-PerformanceTableFinal2011.pdf (assessed on 10 April 2018)

and helped by external impetus (i.e., the IMO and the Paris MOU). The research highlighted the regional PSC MOU systematically with a view to demonstrating how ship are being inspected against waste retention and substandard ship that can ultimately constitute waste within and around the port if not properly managed. It is the responsibility of port state control to guarantee adequate implementation of the provision of Basel and Bamako Convention as related to port waste management, for example under Article 9 which requires the exporting nation to report the import of an illegal shipment of waste within thirty days.²¹⁴

2.3.2.1 Paris Memorandum of Understanding

The 1982, Paris Memorandum of Understanding on Port State Control was accepted to encourage safety of ship, and safe guard the port environment against waste from ship.²¹⁵ It's also aiming to eradicate substandard ships from using regional water ways, via a coherent system of port state control. The Memorandum received first signatures from some fourteen nations within the European continent, and others, from non-European nations, such as Canada, subsequently formed part of the MoU.²¹⁶ The procedures were made compulsory in the EU in 1995 via EU Directive 95/21/EC regarding the implementation with regards to ship using member states ports and navigating in waters under the control of the member states of international procedures for safety of ship.²¹⁷ The Directive wants member state to check at least some percentage of ships coming into their ports concerning ships' obedience to required IMO regulations and International Labour Organisation Conventions.²¹⁸ This Directive has been revised frequently, nonetheless a notable revised came within the Erika I package.²¹⁹

²¹⁴ Article 9 of Basel Convention. & Bang, H.S., 2008. Is port state control an effective means to combat vessel-source pollution? An empirical survey of the practical exercise by port states of their powers of control. *The International Journal of Marine and Coastal Law*, 23(4), pp.715-759.

²¹⁵ Paris, M.O.U., 2012. Paris Memorandum of Understanding on Port State Control including 34th amendment.

²¹⁶ Paris, M.O.U., 1982. Paris Memorandum of Understanding on Port State Control. 2016-0701[2016-12-01]. [https://www.parismou.org/system/files/Paris% 20Mo U% 2C% 20including% 2039th% 20amendment% 20_rev% 20final_. pdf](https://www.parismou.org/system/files/Paris%20MoU%20including%2039th%20amendment%20rev%20final_.pdf).

²¹⁷ Erik Jaap Molenaar and B. Pons., 2009 EU Directive on Port State Control in Context. *The international Journal of Marine and Coastal law*, 11, (2), pp. 241-288.

²¹⁸ Ibid.

²¹⁹ <http://lup.lub.lu.se/luur/download?func=downloadFile&recordId=3800028&fileId=3800046> (Assessed on 10 March 2018).

2.3.2.2 Tokyo Memorandum of Understanding

Similarly, the Tokyo Port State Control MOU designed some set international procedures which are to be implemented by the port authorities against all ships coming to their ports:²²⁰

- the 1966 International Convention on Load Lines;²²¹
- the 1974 International Convention for the Safety of Life at Sea (SOLAS);²²²
- the 1978 Protocol to the 1974 SOLAS Convention;²²³
- the 1973 Convention for the Prevention of Pollution from Ships (MARPOL)²²⁴;
- and the 1978 Protocol;²²⁵
- the 1978 Convention on Standards for Training, Certification and Watch keeping for Seafarers;^{226,227,45}
- The 1976 Merchant Shipping (Minimum Standards) Convention of the International Labour Organisation (ILO Convention No. 147).²²⁸ Etc.

Though, some disparity in the agreement values used by port states under regional MOUs can occur. Tokyo MOU section 2.4,²⁴⁷ commands individual inspecting region to use international procedures which are in operation and compulsory for that port

²²⁰ Li, K.X. and Zheng, H., 2008. Enforcement of law by the Port State Control (PSC). *Maritime Policy & Management*, 35(1), pp.61-71.

²²¹ International Convention on Load Lines, done Apr. 5, 1966, T.I.A.S. No. 6331, 640 U.N.T.S. 133 (entered into force July 21, 1968).

²²² International Convention for the Safety of Life at Sea, done Nov. 1, 1974, T.I.A.S. No. 9,700, 1184 U.N.T.S. 2 (entered into force May 25, 1980) [hereinafter ICSLS].

²²³ Protocol of 1978 Relating to the International Convention for the Safety of Life at Sea, done Feb. 17, 1978, T.I.A.S. No. 10,009, 17 I.L.M. 579 (entered into force May 1, 1981) [hereinafter SOLAS].

²²⁴ International Convention for the Prevention of Pollution from Ships (MARPOL), done Nov. 2, 1973, 12 I.L.M. 1319.

²²⁵ Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships (MARPOL), done Feb. 17, 1978, 17 I.L.M. 546 (entered into force Oct. 26, 1983).

²²⁷ International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, done July 7, 1978, reprinted in 6D Benedict on Admiralty doc., 14-6, at 14- Convention Concerning Minimum Standards in Merchant Ships, Oct. 29, 1976, 15 I.L.M. 1288 (entered into force Nov. 28, 1981) [hereinafter ILO Minimum Standards Convention].483 (Frank L. Wiswall ed., 7th ed. rev. 1998) (entered into force Apr. 28, 1984).

²²⁸ Cariou, P., Mejia, M.Q. and Wolff, F.C., 2009. Evidence on Target Factors Used for Port State Control Inspections. *Marine Policy*, 33(5), pp.847-859.

state. The treaties enumerated above are legally in operational. Furthermore, the available data of state endorsement of the convention in the Tokyo MOU region is very pleasant, at the moment, four out of eight instruments having been approved by all the Tokyo MOU states.²²⁹

2.3.2.3 Abuja Memorandum of Understanding on Port State Control for West and Central African Region

Abuja, Nigeria Memorandum of Understanding approved and endorsed by most of maritime nations in Africa.²³⁰ The MoU applies to total number 22 nations from South Africa to Mauritania Memorandum of Understanding, jointly administer under a cooperative agreement with the IMO.²³¹ The main aim of the MoU aims to advance a scheme to harmonise port state joint inspection control process for the entire region. The idea is to reduce, and subsequent eradication of substandard ship, to prevent marine waste, and enhancement of work and living conditions of seafarers aboard ships.²⁵¹

The Memorandum of Understanding developed and harmonised the port state control blueprint to be used in the region and check statement analyses are available in their yearly statements and on its website for the public.²⁵² However, with the Abuja MoU it is, challenging to discover new trends due to a lack of statistical data and consequently it is difficult to check at the moment the impact of the work of the MoU under

MARPOL 73/78.²³²

Lastly, the management of waste at port within the maritime environment and marine safety involves a proper coordination and harmonisation. Thus, port state control (PSC) rules must be significantly promoted in every country to ensure adequate

²²⁹ Ibid.

²³⁰ Mfon Ekong Usoro. Port State Control: A tool for Sustainable Management of Maritime Safety and Marine Environment. A Paper Delivered at Maritime Women: Global Leadership International Conference on the 31st -1st April 2014.

²³¹ About Us - Abuja Memorandum of Understanding <http://www.abujamou.org/index.php?pid=63d7s92j239sds7dh> (Assessed on 23, June 2017). 251 Neumann, T. ed., 2013. Marine Navigation and Safety of Sea Transportation: STCW, Maritime Education and Training (MET), Human Resources and Crew Manning, Maritime Policy, Logistics and Economic Matters. 252 Ibid.

²³² Kasoulides, G., 1990. Paris Memorandum of Understanding: a regional regime of enforcement. *Int'l J. Estuarine & Coastal L.*, 5, p.180.

compliance with global standards on safety at sea.²³³ The PSC regime initiatives measure against substandard ships from operating within the region. Available records of such reduction in the number of detentions of ship via compliance procedures improvement in return to business in the region with the assurance that there is no room for substandard ship to operate.²³⁴ The reverse is the case in the region with inadequate implementation of PSC: the consequence of ineffective implementation of port state control scheme is the concentration of substandard ships in the region as ship owners observe the areas as a conducive area to operate which often leads to waste dumping to marine environment and subsequently.²⁵⁶ Ships capitalise on the lack of proper harmonisation procedures and weak enforcement procedures.²⁵⁷

2.3.2.4 Enforcement and implementation of the MOUs in the UK and Nigeria

International law acknowledges port state can enforce its national legislations to ship within its territory. The narrative within the port state is that, new set of uniform legislations and procedures would apply by the regional ports authorities to ship coming to the area.²³⁵ The uniform common standard and procedure approved in the regional port state MOUs are those fashioned in accordance with by the several international conventions that has to do with protection and environmental procedures for ship.²³⁶

It must be noted that standard and procedure that port state can enforce to a ship coming into their ports are still limited with some legal restrictions. Thus, international customary law ensures port state would only be allowed to implement laws that deals with foreign ship activities that occurs while the ship is at the port within the region. ²³⁷

²³³ Rakestraw, A., 2012. Open oceans and marine debris: solutions for the ineffective enforcement of MARPOL Annex V. *Hastings Int'l & Comp. L. Rev.*, 35, p.383.

²³⁴ Cariou, P., Mejia Jr, M.Q. and Wolff, F.C., 2007. An econometric analysis of deficiencies noted in port state control inspections. *Maritime Policy & Management*, 34(3), pp.243-258.

²⁵⁶ Bang, H.S. and Jang, D.J., 2012. Recent developments in regional memorandums of understanding on port state control. *Ocean Development & International Law*, 43(2), pp.170-187.

²⁵⁷ Usoro, M.E. and General, S., 2014. Port state control: a tool for sustainable management of maritime safety and marine environment. In *Proceedings of Maritime Women: Global Leadership International Conference* (Vol. 1).

²³⁵ John D and Sarah T.; *supra* note 199, pp. 111-128.

²³⁶ McDorman, T.L., 2000. Regional Port State Control Agreements: some issues of International Law. *Ocean and Coastal Law Journal*, 5(2), p.2.

²³⁷ *Ibid.*

This comprises implementing regulation on safety construction, design, and standardisation of shipping equipment. The 1982 Law of the Sea Convention, which can also be referred to as international customary law of the sea, admits that port state can only apply legislations that relay with the actions of a overseas ship that takes place in the waters of the port state after the entry of such ship to its port.²³⁸ The justification is that, in this condition, the procedure to follow by port state would be international law of the sea passed in harmony with the International Law of the Sea or the relevant international directives and procedures for ship generated waste reduction, prevention, and control.²³⁹

Where foreign ship activity resulted to a pollution discharge, on the high seas or port waters of a third state, if such act of pollution does not disturb port state activities, international customary law will not allow host nation to apply its procedural legislations concerning such action act the ship in its ports.²⁴⁰ In such situation circumstance, the applicable procedural law would be that of the coastal state or flag state where the action accrued.²⁴¹ Article 218 of the Law of the Sea Convention, only allow port state implementation provision to establish an implementation procedure for a port state in the occasion where a foreign ship releases a waste in the waters or on the high seas of another state in breach of prevailing international standards.²⁴² Similarly, under Article 211(3) of the 1982 Law of the Sea Convention, a port can set its own rules or impose certain conditions to be met as far as port waste management is concern to a reasonable extent on ship visiting the port to control pollution at the port.²⁴³

²³⁸ McDorman, T.L., 1997. Port State enforcement: a comment on article 218 of the 1982 law of the sea convention. *J. Mar. L. & Com.*, 28, p.305.

²³⁹ Klein, N. and Rothwell, D.R., 2009. *Maritime Security and the Law of the Sea*. In *Maritime Security* Routledge.pp48-62.

²⁴⁰ Lowe, A.V., 1974. The enforcement of marine pollution regulations. *San Diego L. Rev.*, 12, p.624.

²⁴¹ Anderson, D.H., 1996. Investigation, detention and release of foreign vessels under the UN Convention on the Law of the Sea of 1982 and other international agreements. *The International Journal of Marine and Coastal Law*, 11(2), pp.165-177.

²⁴² Boyle, A.E., 1985. Marine pollution under the Law of the Sea Convention. *American Journal of International Law*, 79(2), pp.347-372.

²⁴³ de La Fayette, L., 1996. Access to ports in international law. *The International Journal of Marine and Coastal Law*, 11(1), pp.1-22.

2.4 UK National Laws on Port Waste Management

In the UK, the initial point for the implementation of any laws is for the Transport Secretary of State as the minister which is empowered to make regulations for its implement.²⁴⁴ Thus, section 21 of the Merchant Shipping Act 1979 gives the Secretary for Transport wide powers to make ship health and safety regulations.²⁴⁵ The bulk of the European Community port state control legislation was accepted in the UK by means of the Merchant Shipping (Port State) Regulations 1995.²⁴⁶ Under the regulations, the Southampton port Marine Safety Agency (MSA) is required to inspect seagoing ship calling at or anchored off UK ports and offshore installations to make sure that they are carrying required documentations by the applicable international safety and marine pollution conventions.²⁴⁷ Where clear grounds exist-either because of noncompliance with the conventions or the nature or type of ship involved the regulations permit a more comprehensive check to be observed.²⁴⁸ In the case of ship navigating on a steady basis to and from the UK port, likewise for certain other specified types of ship, the regulations require the MSA to annually conduct an expanded inspection, subject to discussion with the Maritime Administrations of the other port nations on the service.²⁴⁹

The regulations make it clear that inspection and detention may be ordered in such circumstances as may be required by the Council Directive. The regulations also require that a report of the more detailed or expanded inspection should be provided to the ship master.²⁵⁰ The regulations are extremely detailed. They cover such subjects as the qualifications of inspectors, the duty of pilots and port authorities to

²⁴⁴ Cariou, P., Mejia, M.Q. and Wolff, F.C., 2008. On the Effectiveness of Port State Control inspections. *Transportation Research Part E: Logistics and Transportation Review*, 44(3), pp.491-503.

²⁴⁵ Merchant Shipping Act 1979.

²⁴⁶ Merchant Shipping (Port State) Regulations 1995.

²⁴⁷ Cariou, P., Mejia, M.Q. and Wolff, F.C., 2009. Evidence on target factors used for port state control inspections. *Marine Policy*, 33(5), pp.847-859.

The regulations do not apply to fishing vessels, warships, naval auxiliary vessels, wooden ships of primitive build, government ships used for non-commercial purposes, pleasure yachts not engaged in trade, and, to a limited extent, ships below 500 GRT.

²⁴⁸ Knapp, S. and Franses, P.H., 2007. A Global View on Port State Control: Econometric Analysis of the Differences Across Port State Control Regimes. *Maritime Policy & Management*, 34(5), pp.453-482.

²⁴⁹ Ibid.

²⁵⁰ Anderson, D., 2002. The Effect of Sort State Control on Substandard Shipping. *Maritime Studies*, 2002(125), pp.20-25.

make reports, the publication of detention information, the fees to be charged, appeal rights, and the compensation to be paid for wrongful detentions. They also direct that crews are to be examined to ascertain their familiarity with essential safety procedures and operations.²⁵¹

2.4.1 Environmental Protection Act 1970

The Environmental Protection Act 1990 enforces a duty of care on all person in the waste management scheme to ensure that all available procedure is adhere to so that waste is legally and safely disposed of.

The provision of section 34 (1) of above Act state that;

Subject to subsection (2) below, “it shall be the duty of any person who imports, produces, carries, keeps, treats or disposes of controlled waste or, as a broker, has control of such waste, to take all such measures applicable to him in that capacity as are reasonable in the circumstances”.²⁵²

The above section of the act placed urge responsibility on waste disposer to dispose waste or manage it properly. Under section

35 (1) of the Act, “A waste management licence is a licence granted by a waste regulation authority authorising the treatment, keeping or disposal of any specified description of controlled waste in or on specified land or the treatment or disposal of any specified description of controlled waste by means of specified mobile plant”.²⁵³

The implication of this section is that port waste management must be properly transferred within and around the port safely done. It means appropriate licensed person under the law must take custody of the waste with transferred note i.e. Waste Transfer Note (WTN), comprising detailed information and as well as an accurate explanation of the waste to certify it is correctly disposed of or treated.

Associated British Port admits it possess a duty of care for ship-generated landed by ship at the port, it also receive WTN from licensed waste management contractor

²⁵¹ Ibid.

²⁵² Environmental Protection Act 1970. Section 34.

²⁵³ Environmental Protection Act 1970. Section 35

when such waste is removed from the port for disposal.²⁵⁴ If other transfer waste arrangements are accepted by a direct contract system i.e. between the agent and master and waste licensed agent directly, it might fall outside the duty of the port authority to accept a copy of WTN.²⁵⁵

The law is being implemented and enforced in the UK under section 13 (1) “If the enforcing authority is of the opinion that the person carrying on a prescribed process under an authorisation is contravening any condition of the authorisation, or is likely to contravene any such condition, the authority may serve on him a notice (“an enforcement notice”).²⁵⁶ The argument here is that, though the act used the word ‘If the enforcing authority is of the opinion’ without being specific on the nature of what could have constituted the enforcing authority to take a major step when he is of the opinion that waste is not properly managed. This might be too generic to substantiate perhaps a directive will be made to other legislations in future to substantiate the above section.

The above Act is one of the efficient complete law when it comes to handling and management of port waste at the port in the UK. The entire exercise of waste management is for the environmental protection.²⁵⁷ The legislation is designed to ensure proper regulation of waste arising from industrial areas, and to provide adequate facilities for waste disposal. The legislation enforces a litter-free environment and public places litter-free and clean. The provision of the Food and Environmental Protection Act 1985 with regards to waste dumping at sea, is to arrange provision for the oil pollution prevention from ships, etc. The legislation emphasizes the notion of the polluter principle i.e. polluter pays for the cost of waste and must have a duty of care to the human environment. This duty cannot be transferred to others except a legal authorisation procedure is undergone.²⁸¹

²⁵⁴ Butt, N., 2007. The impact of cruise ship generated waste on home ports and ports of call: A study of Southampton. *Marine Policy*, 31(5), pp.591-598.

²⁵⁵ Alderton, P. and Saieva, G., 2013. *Port Management and Operations*. Taylor & Francis.

²⁵⁶ Environmental Protection Act 1970. Section 13.

²⁵⁷ Osborn, D., 1997. Some reflections on UK environmental policy, 1970-1995. *J. Env'tl. L.*, 9, p.3.

²⁸¹ Owens, S., 2012. Experts and the Environment—the UK Royal Commission on Environmental Pollution 1970–2011. *Journal of Environmental Law*, 24(1), pp.1-22.

2.4.2 Waste Management Licensing Regulations 1994

The temporary storage of waste at reception facilities or ship-generated waste at the port is an action that is exempted from the control of waste management licensing.

Section 36 of the schedule 3 of the Waste Management Licensing Regulations 1994, states that; “the temporary storage of waste involving of waste, including any such waste which is special waste, at reception facilities provided within a port area in accordance with the Merchant Shipping (Reception Facilities for Waste) Regulation 1988, where such storage is incidental to the collection or transport of the waste and so long as (a) the amount of waste so store within port area at any time does not exceed 20 cubic metres for each ship from which waste has been landed (b) no waste is so sorted for more than seven days”.²⁵⁸

The waste Management Licensing Regulation 1994 have been rescinded in England and Wales. However, still applicable in Scotland and the exemption is now included in schedule 25, (part 3) of the Environmental Permitting Regulation 2010, as follows;

Temporary storage from the production place 2 (1) waste storage in a place of generation temporarily, awaiting it collection. (2) for the purpose of this paragraph, the condition is (a) no waste is stored beyond the duration of 12 months; and (b) the waste is deposited in a protected place’.²⁵⁹ However, the above exemption might not be registered, but it must be complied with the term and conditions.²⁶⁰

2.5 Nigeria National Laws on Port Waste Management

Management of port waste in Nigeria is governed by Federal legislations, and subject to the jurisdiction of the Federal High Court (FHC). It falls within Exclusive Legislative list, Second Schedule Part 1 1999 Nigeria Constitution as amended.²⁸⁵ Though, waste management was not specially mentioned as a subject either on both legislative list in the Nigeria Constitution which is mentioned in the second part to the 1999 constitution that addresses matters related to the environment. However, section 4 of the 1999 Constitution empowers the Nigeria National Assembly to make legislations for the

²⁵⁸ Merchant Shipping (Reception Facilities for Waste) Regulation 1988.

²⁵⁹ Environmental Permitting Regulation 2010.

²⁶⁰ Jones, C., 2010. Exploring new ways of assessing the effect of regulation on environmental management. *Journal of Cleaner Production*, 18(13), pp.1229-1250. ²⁸⁵ Constitution of the Federal Republic of Nigeria 1999.

good government, peace and order of the country with regards to any matter contained by the Exclusive Legislation list.²⁶¹ Pursuant to these provisions of the law in Nigeria, many laws addressing environmental challenges have been enacted. This view is further supported by the Constitution of Nigeria in section 20 which provides that “they must safeguard and enhance the environment and protect the land, forest, waterways, air, and wild life in Nigeria”.²⁶² Thus, port waste management falls under the Admiralty Jurisdiction Act, Cap A5 Laws of Federal Republic of Nigeria, 2004(AJA), and section 254 of the Nigeria 1999 Constitution and section 21 of the Admiralty Jurisdiction Act (AJA) empowers the Federal High Court to entertaining any matter brought before it via the above provision of law.²⁶³

2.5.1 National Environmental Standards and Regulations Enforcement Agency (Establishment) Act, 2007

The National Environmental Standards and Regulations Enforcement Agency is responsible for waste management in Nigeria (NESREA), and was created by the NESREA Act in accordance with the 1999 constitution section 20 thereof. The organ of the government is saddles with responsibility of waste collection, treatment and disposal in Nigeria.²⁶⁴ The Agency is charges with implementation and enforcement of environmental laws, in Nigeria. And as well as implementing compliance with provisions of international legal instruments to which Nigeria is a signatory to like MARPOL, and Abuja MOU. Under section 8. (g) “The Agency shall have power to conduct public investigations on pollution and the degradation of natural resources, except investigations on oil spillage”.²⁶⁵ The Agency in collaboration with agency such as the Nigeria Port Authority has power to investigate incidence of pollution at the port. Section 8 (o) “empowers the agency to form a joint effort with sister agencies via the approval of the Minister, to create or initiate schemes for the stoppage, decrease and elimination of pollution and other forms of environmental degradation in the nation's entry points for enhancement and restoration of the nation's natural resources”.²⁶⁶

²⁶¹ Ibid.

²⁶² Constitution of the Federal Republic of Nigeria 1999. ss.20.

²⁶³ Admiralty Jurisdiction Act, Cap A5 Laws of Federal Republic of Nigeria, 2004.

²⁶⁴ <http://www.nesrea.gov.ng/about-us/> (Assessed on 7 December 2017)

²⁶⁵ National Environmental Standards and Regulations Enforcement Agency (Establishment) ss.8.

²⁶⁶ Ibid.

The agency guidelines and its activities are being monitored by the highest decision making in Nigeria. This is properly strengthening under section 18 of the Act as follow; The shall be directed to prepare and submit a report to the Government via the Minister, not later than June 30th in each year about its activities'.²⁶⁷

Port waste management impact can be dreadful if it is not properly managed, or those saddle with responsibility to ensure waste is adequately managed failed to in their responsibility. Therefore, the implementation of the Act under section 20 (3) (4) sets out as follows; "A person who violates the regulations made pursuant to subsection (1) of this section commits an offence and shall on conviction, be liable to a fine not exceeding N 200,000 or to imprisonment for a term not exceeding one year or to both such fine and imprisonment and an additional fine of N20, 000 for every day the offence subsists". (4) "Where an offence under subsection (1) of this section is committed by a body corporate, it shall on conviction be liable to a fine not exceeding N2, 000,000 and, additional fine of N50,000 for every day the offence subsists".²⁶⁸

The examination and justification for the establishment of NESREA power and the rationale behind the making of the regulations. Its significant to says that the recent ingenuities brought about by the NESREA Act are practical, mostly about its implementation and execution of it provision for more realistic sanctions that can help prevents environmental damage in Nigeria. It is apparent that evaluation and preservation of the general management of environment and natural in heritage is important to sustainable development in Nigeria.²⁹⁴ The enforcement of both the NESREA Act and its procedure needs necessary capacity building of the agency in terms of financial strength, human, technical, and material. Cooperation and teamwork with many stakeholders in safeguarding the management and environment of natural resources in Nigeria with regards to port waste management and its implementation.

2.5.2 The Nigerian Maritime Administration and Safety Agency Act 2007

²⁶⁷ National Environmental Standards and Regulations Enforcement Agency (Establishment) ss.18.

²⁶⁸ National Environmental Standards and Regulations Enforcement Agency (Establishment) ss.20. ²⁹⁴ Ladan, M.T., 2012. Review of NESREA act 2007 and regulations 2009-2011: a new Dawn in environmental compliance and enforcement in Nigeria. *Law Env't & Dev. J.*, 8, p.116.

The Nigerian Maritime Administration and Safety Agency (NIMASA), which was formerly called the National Maritime Authority (NMA), is the agency of the Government recognised for the regulation of maritime activities in Nigeria.²⁶⁹ It implements both local laws and international regulations on maritime activities passed by the Nigerian government.²⁷⁰ The Agency can be labelled as the highest agency of government that sets guidelines for the merchant shipping and is positioned under the control of the Federal Ministry responsible for Maritime Transportation.²⁷¹ NIMASA was established by the Nigerian Maritime Administration and Safety Agency Act of 2007 which came into existence on 25 May 2007 and rescinded and replaced the National Shipping Policy Act of 1987,²⁹⁸ under which the former National Maritime Authority was established. The objective of the Agency is echo in section 1 of the Act as being to: (i) “to promote the development of indigenous commercial shipping in international and coastal shipping trade”; and (ii) “to regulate and promote maritime safety, security, marine pollution and maritime labour”.²⁷²

The functions and authorities of the Agency are stated in more detail in section 22 of the Act. NIMASA is empowered to act as port and flag state duties as well as to establish procedures for the execution of conventions of the International Maritime Organisation. Most of the functions which the Agency is authorised to perform are based on one form of international convention or the other. It is provided in section 2(I) of the NIMASA Act 2007 “that the Act shall apply to ships, small ships and crafts”.²⁷³ It is, therefore, pertinent that these conventions or international treaties to which Nigeria is a signatory are made part of its domestic laws for the purpose of both domestic and international enforcement. The interrelationship between international law and domestic or municipal law is not always an easy one though. Municipal law administers domestic issues in country and deals with issues between individuals, and between individuals and government, while international law focuses primarily upon

²⁶⁹ Dogarawa, L.B., 2014. Maritime Archives Administration in Nigeria: A Blueprint. *Journal of Maritime Research*, 6(3), pp.59-74.

²⁷⁰ Ibid.

²⁷¹ Section 2(4) of the NIMASA Act 2007.

²⁹⁸ National Shipping Policy Act of 1987.

²⁷² Section 1(i) (ii) of the NIMASA Act 2007.

²⁷³ section 2(I) of the NIMASA Act 2007.

the relations between sovereign states.²⁷⁴ However, there are many instances where problems can emerge and lead to difficulties between the two systems especially where there is a conflict between them by the obligations imposed in any one of them.

In Nigeria, port state control is planned to stop deficient shipping activities and serves to prevent pollution prevention and marine safety. It serves to protect ships which are obliged to conform to international standards particularly with regards to waste management, either on-board ship or at the port. Thus, by virtue of SS.22(1) and SS.22(4) of the Nigerian Maritime Administration and Safety Agency (NIMASA) Act 2007 and S.2(1) of the Merchant Shipping Act 2007, all maritime safety functions are to be implemented by the Agency.³⁰² As part of the Agency responsibilities on the existing legal regulatory framework, the Agency carries out its Maritime Safety, Maritime Security operations and Seafarers Standard Training & Certification functions. Section 22 (1) of the NIMASA Act 2007 saddled the Agency with the responsibility of carrying out the following activities in pursuit of her statutory functions²⁷⁵

The legal framework shapes the structural functions of the Agency, separate from its former organisations. Thus, with regards to the scope and nature of statutory responsibility, NIMASA is the apex organisation saddled with huge responsibilities of ensuring waste is adequately managed at the port and other safety issues are properly addressed. The NIMASA Act 2007 made it clear that the Agency is a “Maritime Administration”, thus the Agency obligation to conduct, promote and administer public strategies in the sector cannot be over emphasised. As far as waste management is concerned at the port, NIMASA has incorporated Abuja MOU into its working strategy by ensuring implementation in accordance with the extant law establishing the agency.²⁷⁶

To further give credence to proper implementation of the Abuja MOU, NIMASA through its Environment Management Department, legally accountable for safeguarding all ports in Nigeria via a more realistic way to implement all pertinent IMO

²⁷⁴ Chinonyerem, N.T., Ntor-Ue, M., Chukwudi, I.C. and Chinedum, O., 2017. Economic Implications of Marine Oil Spill to Nigeria: A Case for Improvement in Coastal Pipeline Management and Surveillance Practices. *International Journal of Economy, Energy and Environment*, 2(3), p.40. ³⁰² Nigerian Maritime Administration and Safety Act SS.22 (1) and SS.22 (4).

²⁷⁵ Nigerian Maritime Administration and Safety Act SS .22 (1).

²⁷⁶ Ibid.

Conventions. The concern is likely to attain more robust and friendly port environment devoid of ship-generated waste to enable shipping activities to be carried out in a healthier environment. It will safeguard also avoid the destruction of marine habitat; whilst supply of human consumption will remain unchanged and human existence will be assured. The Agency derives its legal authority from Part XXIII Section 335 of the Merchant Shipping Act 2007 and Sections 22(2); 23 (9) (b) of the NIMASA Act, 2007.²⁷⁷

2.5.3 The Merchant Shipping Act of 2007

The Merchant Shipping Act of 2007, became enforceable on May 28 2007, the Act revoked and replaced the initial Merchant Shipping Act, which had been in existence for some decades beginning from 1962 and had rarely been amended or updated since then.³⁰⁶ According to the 2007 Merchant Shipping Act, some of the International legal frame work and conventions on merchant shipping enacted by the IMO and signed by Nigeria were fused within the body of law in Nigeria. Hence, make such international legal instrument back by domestic given law in Nigeria by NIMASA. It applies on the merchant, as opposed to military, shipping is concerned. NIMASA is the organ of government which implements, administers and enforces the Merchant Shipping Act of 2007 under the general supervision of the Federal Minister responsible for Waterways Transport.²⁷⁸

The maritime safety and labour related Conventions of the IMO which have been made applicable as part of Nigerian law are provided for under section 215 of the MSA 2007, which states that: "Right from the inauguration of this Act, the categories of the Protocols, Treaties and their alterations connecting to Maritime Safety shall apply, that is -

- International Convention for the Safety of Life at Sea, 1 974 (SOLAS);

²⁷⁷ <http://nimasa.gov.ng/services/maritime-environment-mgt> (Assessed on 05/12/2017) ³⁰⁶
Section 439 of the MSA 2007 repealed the MSA of 1962 contained in Cap. 224, Laws of the Federation of Nigeria, 1990.

²⁷⁸ Section 2(2) of the NIMASA Act 2007 excludes its application to "warships and military patrol ships." Likewise, section 424 of the MSA 2007 provides that: "Unless otherwise specially provided in this Act or by regulations under this Act, nothing in this Act shall apply to a ship which belongs to the Nigerian Navy or the Nigerian Naval Reserve or the Government."

- Protocol Relating to the International Convention for the Safety of Life at Sea, 1988 and Annexes I to V thereto;
- International Convention on Standards of Training Certification and Watch Keeping of Seafarers, 1978 (STCW) as amended²⁷⁹;
- International Convention on Maritime Search and Rescue, 1979 (SAR);

The Nigerian law provided in section 335 (I) of the MSA 2007, which states that legislative guidelines of the following International Conventions and Agreements shall apply²⁸⁰:

- International Convention for the Prevention of Pollution from Ships, 1973 1978 and the Annexes thereto;
- Convention Relating to Intervention on the High Seas in Cases of Threatened Oil Pollution Casualties, 1969; etc. Any International Agreement or Convention not mentioned in paragraphs shall apply to protect port in Nigeria²⁸¹

(a) to (h) “of this subsection which relates to decrease or avoidance and control of waste at the sea or other waste from ships, compensation and civil obligation for pollution damage from ships to which Nigeria is a party”.

Section 335(3) “authorises the Minister to make directives giving regards to the guidelines of the International legal regulations listed above, while section 336 empowers the Minister to, by Directive, make such procedure as he deem fit suitable for the aim of giving command to any guidelines of the United Nations Convention on the Law of the Sea 1982 for the preservation and protection of the port environment from waste substance from ships”.²⁸²

The domestication in Nigeria of most of the international maritime conventions passed by the IMO by the MSA of 2007 is a welcome development. This Act has brought most

²⁷⁹ Jones, C., 2010. Exploring new ways of assessing the effect of regulation on environmental management. *Journal of Cleaner Production*, 18(13), pp.1229-1250.

²⁸⁰ Ibid.

²⁸¹ Tetley, W., 1999. Uniformity of international private maritime law-the pros, cons, and alternatives to international conventions-how to adopt an international convention. *Tul. Mar. LJ*, 24, p.775.

²⁸² Section 215,335,336 of the MSA 2007.

of Nigeria's laws applicable to maritime activities at par with what obtains internationally.²⁸³

The MSA 2007 in making the most significant maritime safety, and pollution prevention conventions applicable in Nigeria has determine obedience by Nigeria with international legal framework and convention guidelines by making its national legislatives on maritime laws in conformity with international maritime laws in this regard as far as port waste management is concern. This has secured Nigeria's ability to effectively exercise port state implementation of international maritime rules and regulations over ships flying its flag and, conversely, enforce the same standards on foreign ships plying its ports. Article 94 of the United Nations Convention on the Law of the Sea 1982, which imposes this duty on contracting States, of which Nigeria is signatory to.²⁸⁴ It is clear from the above discussion that the MSA 2007 has incorporated into Nigeria's maritime laws the most important of the current maritime safety, pollution prevention.²⁸⁵ The Act set out in a clear term with regards to protection of nation's port from pollution.

The International Maritime Organisation has generated Guidelines on the containment and prevention of marine pollution by ships. For example, Reg. A851 (20) concerning the general principles to which the notification systems and requirements for ships must comply, including guidelines for reporting events involving dangerous goods, harmful substances or pollutants from the sea. In turn we can also find documents describing the procedures for ships in emergency transporting hazardous materials (MSCCirc.1025 generated by the FE Guide which contains guidance on the Emergency Procedures for ships carrying dangerous goods, including the Certification Sheets).²⁸⁶

²⁸³ Omo-Ebah, O., 2012. Maritime Law Reforms: The Interface between International Law and Nigerian Law. *IJDLR*, 1, p.175.

²⁸⁴ Article 94 of the United Nations Convention on the Law of the Sea 1982.

²⁸⁵ Dogarawa, L.B., 2014. Maritime Archives Administration in Nigeria: A Blueprint. *Journal of Maritime Research*, 6(3), pp.59-74.

²⁸⁶ Rafeeqi, S.F.A., Lodi, S.H., Khan, R.A. and Zafar, N.S., 2010. An adaptive monitoring model for the ageing assessment of concrete containment vessel. *NED University Journal of Research*, 7(1), pp.55-63.

It is important to note that, within the content of Chapter VII of the SOLAS 74/88 Convention,²⁸⁷ we will find guidelines on the carriage of solid hazardous goods in bulk, construction and equipment of ships transporting hazardous liquid chemical products in bulk and liquefied gases to bulk, and special requirements for the transport of exposed nuclear fuel, plutonium and high-level waste in packages on board ships.²⁸⁸

The main generating sources of dirty water produced by humans are the product of land-based activities, such as those of municipal sewage systems or dirty water treatment facilities, but the discharge of dirty water into the sea from ships also contributes to its pollution.²⁸⁹ The discharge into the sea of untreated sewage can cause risks to the health of people, as sewage can generate oxygen depletion and visual pollution in coastal areas, directly impacting the states that exploit within of its economy the tourist resources. The discharge of dirty water from ships contributes to the pollution of the port that is generated from land.²⁹⁰

The MARPOL 73/78 Convention in its Annex IV, Rule 1 defines waste water from drains and other waste from any type of toilet and urinals drains from washbasins, laundries and exit pipes located in medical service chambers (dispensary, hospital, etc.)²⁹¹. It drains from spaces in which live animals are transported, or other wastewater when mixed with the drainage above defined. These standards reach several ships that make international trips, taking within one of the parameters of reference the transport of more than 15 people. The ships would be required to be equipped with a permitted dirty water treatment facility or with an approved system for shredding and disinfecting dirty water or with a dirty water retention tank. The dumping of dirty water into the sea is banned unless the following conditions are met:

- That the vessel discharges above 3 nautical miles from the adjoining land if the wastewater has been previously shredded and disinfected by means of a

²⁸⁷ Brown, E.D., 2001. *Sea-bed Energy and Minerals: Sea-bed mining* (Vol. 2). Martinus Nijhoff Publishers.

²⁸⁸ Gupta, A.K., Gupta, S.K. and Patil, R.S., 2005. Environmental management plan for port and harbour projects. *Clean Technologies and Environmental Policy*, 7(2), pp.133-141.

²⁸⁹ Ibid.

²⁹⁰ Cycon, D.E., 1981. Calming troubled waters: The developing international regime to control operational pollution. *J. Mar. L. & Com.*, 13, p.35.

²⁹¹ Curtis, J.B., 1984. Vessel-source oil pollution and MARPOL 73/78: an international success story. *Envtl. L.*, 15, p.679.

system approved by the administration, in accordance with the provisions of regulation 9.1.2 (41) of this Annex, or at a distance greater than 12 nautical miles from the adjacent land if they have not been previously disinfected.²⁹²

- In any case, the dirty waters that have been stored in the holding tanks, or the dirty waters coming out of spaces comprising live animals, will not be dumped instantaneously, but at a moderate rate, the ship being en-route and sailing at a speed not less than 4 knots This dumping regime must be permitted by the official considering the standards developed by the Organisation.
- The vessel uses an approved wastewater treatment facility, whose compliance with the operating requirements mentioned in regulation 9.1.1 of this Annex has been certified by the administration, and that the effluent does not produce visible floating solids or cause coloration in the surrounding waters²⁹³. For this context, special zones are the Baltic Sea area framed in Annex I of MARPOL 73/78 and any other maritime zone selected by the organisation in line with the standards and procedures for the description of special zones with regard to the prevention of contamination by dirty water from ships

2.6 Summary

This chapter has debated in full detail some of the regulations from national, regional and international perspectives, with a view to give first-hand information as to how all the regulations were designed to address port waste and ultimately to curb ineffective waste management at the ports. Once the crossing has been developed, in this normative area that frames the problem of waste from ships, one can appreciate the multiplicity of agreements and codes that form a great puzzle that, in certain opportunities, present obstacles to interpret and interrelate. We could observe that some definitions related to port waste management processes are similar or present some variables, which indicates that this topic should be analysed in depth in order to achieve efficient and effective results system. This might focus on complying with the

²⁹² Jarzemskis, A. and Jarzemskiene, I., 2016. The Model to Assess the Implementation of Technical Conditions Defined in Annex IV of Marpol Convention 73/78: The Case of the Baltic Sea Port of Klaipeda. *Transport and Telecommunication Journal*, 17(4), pp.335-349.

²⁹³ Ibid.

rules, but primarily to preserve port environment, and that vital space for our planet, which are the mirrors of waters and our seas.

The transport and trade by water is a growing activity, which we must accompany, providing improvement proposals that enhance the culture of safety and protection of the environment, which is a common good to all and irreplaceable, of high value for us and for generations to come. The research has been able to go through specific laws relevant to port waste management, that are active at all times, incorporating new legal parameters through international and national bodies. It involves global policies and opinions of the States and non-governmental organisations to be expressed. For generating instruments that control the maritime and fluvial activity of ships and their impact on the port environment.

There are different factors that affects the environmental performance of port waste management. Here the emphasis will be on legislation that regulates port waste management in the UK. Port waste management in the UK is regulated by the Merchant Shipping and Fishing Vessels (Port Waste Reception Facilities) Regulations 2003 as amended by the Merchant Shipping and Fishing Vessels (Port Waste Reception Facilities) (Amendment) Regulations 2009 (hereafter called the 2003 Regulations as amended) transpose the requirement of Directive 200/59/EC of the European Parliament and Council on reception facilities for ship-generated waste and cargo residues, as amended, into UK law. Under the following regulation in the UK, most port authority and terminal operator (including marinas) is required to:

- To make available reception waste facilities suitable to meet the need of ship normally calling at the port without causing undue delay to ship.
- To make available management waste strategies detailing the requirements and submit it to the State Secretary for Transport for his endorsement.²⁹⁴
- To make it compulsory for any ship coming into the port the need for waste to be charged. And cater for the cost of waste reception facilities for ship waste.
- Notify the port before arrival of waste on-board and the quantities to be discharged.²⁹⁵

²⁹⁴ Shipping and Fishing Vessels (Port Waste Reception Facilities) Regulations 2003. Reg. 6.

²⁹⁵ Shipping and Fishing Vessels (Port Waste Reception Facilities) Regulations 2003. Reg. 11(1).

- Dispose of all ship-generated wastes to port waste reception facilities, save they have reported that such waste would be retained on board.²⁹⁶

In turn, port authority shall make available adequate waste reception facilities and port waste management strategy. Under Regulation 6. (1) “Subject to paragraph (3), “it is the duty of most port authority to ensure waste management strategy with respect to the availability of waste reception facilities and use of such plane will be submitted to the State Secretary for Transportation for approval”. (2) “The State Secretary for Transportation may ask port authority to make available waste management procedure on the use of such facilities by ship-owners at the port harbour and detailed in the direction and submit it to the State Secretary for Transportation for approval”.²⁹⁷

The implication of the above is that under the UK law, it is the responsibility to harbour operator ensure adequate waste reception facilities at the port, though there could be further guidelines as stipulated by paragraph (2) in the regulation and subject to Regulation 7.(1) Subject to paragraph (2), a harbour authority or terminal operator shall submit its first waste management plan to the Secretary of State for approval in accordance with regulation 6(1) or (2), as the case may be.³²⁷

Although fishing vessels are excused from informing ports of their waste, and of paying a compulsory fee, but waste must be landed into reception facilities available at the port. Under Regulation 18(1) it is against the law failure to land waste at the port. The Regulation says that; 18.(1) “Any harbour authority or terminal operator which fails to comply with: (a)any requirement of regulation 4 in relation to the provision of waste reception facilities; (b)any requirement of regulation 6 or 7 to prepare a waste management plan or to submit such a plan to the Secretary of State for approval; or (c)any direction given under regulation 5 or 10 in relation to the provision of waste reception facilities or the implementation of a waste management plan. Shall be guilty of an offence and liable on summary conviction to a fine not exceeding the statutory maximum and on conviction on indictment to a fine.²⁹⁸ Smaller ship not be

²⁹⁶ Shipping and Fishing Vessels (Port Waste Reception Facilities) Regulations 2003. Reg. 12.(1).

²⁹⁷ Shipping and Fishing Vessels (Port Waste Reception Facilities) Regulations 2003. Reg. 6 (1) (2).

³²⁷ Shipping and Fishing Vessels (Port Waste Reception Facilities) Regulations 2003. Reg.7.

²⁹⁸ Shipping and Fishing Vessels (Port Waste Reception Facilities) Regulations 2003. Reg.18.

administered in the same manner, because smaller ship is expected to dispose of their waste in an environmentally sound manner.

Ship must ensure that cleaning systems paraphernalia is handled with care to avoid waste coming into the port via exhaust gas carefully and not discharged into port, harbours or estuaries unless it is thoroughly documented that the waste streams will have no contrary influence on port. The next chapter addresses impact of ship generated waste in the UK and Nigeria.

CHAPTER 3

IMPACT OF SHIP-GENERATED WASTE AT THE PORTS IN THE UK AND NIGERIA

3.1 Introduction

The impact ship-generated waste in the UK and Nigeria ports cannot be overemphasised. Apart from normal activities at the ports, the major work is based upon shipping activities.²⁹⁹ The ships generate various types of waste, which can constitute physical and economic impediment to ports. Thus, ship-generated waste can be defined as wastes from normal activities of ship that can constitute barrier to the smooth operations of the port, if inadvertently, not manage properly.³⁰⁰ Therefore, it is imperative to elucidate upon such waste vis-à-vis both ports case study approach on waste management with a view to minimise waste at the port. Since, these wastes have a profound impact on the port environment, internationally, regionally and nationally, and can affect economic productivity and traffic at the port.

Today, the comparatively new phenomenon of port waste management has a significant part on the global concern for the protection of the port environment.³⁰¹ In an age of unprecedented industrial progress and technology, this concern has only recently become a major one, and some of the concerns might yet to receive proper attention that they deserve.³⁰² Hence, the need for in depth study to recommend possible way out of ineffective port waste management is necessary. Although, there seems to be an apparent belief among port users that the sea has an infinite capacity to absorb anything which is dumped into it, the enormity of damage and destruction has occurred along seaports and to marine life refutes this theory.³⁰³ Nevertheless, the seriousness of waste as a threat to the port, whether underestimated or

²⁹⁹ Onwuegbuchunam, D.E., Ebe, T.E., Okoroji, L.I. and Essien, A.E., 2017. An Analysis of Ship-Source Marine Pollution in Nigeria Seaports. *Journal of Marine Science and Engineering*, 5(3), p.39.

³⁰⁰ Davenport, J. and Davenport, J.L., 2006. The Impact of Tourism and Personal Leisure Transport on Coastal Environments: A Review. *Estuarine, Coastal and Shelf Science*, 67(1), pp.280-292.

³⁰¹ Gold, E., 1971. Pollution of the Sea and International law: A Canadian Perspective. *J. Mar. L. & Com.*, 3, p.13.

³⁰² Broadus, J.M. and Gaines, A.G., 1987. Coastal and Marine Area Management in the Galápagos Islands. *Coastal Management*, 15(1), pp.75-88.

³⁰³ Sagoff, M., 1997. Why save the seas. *Saving the Seas, Values, Scientists, and International Governance*. College Park, MD: Maryland Sea Grant College, p.23.

exaggerated, is becoming increasingly apparent.³⁰⁴ Therefore, to prevent total destruction of the port environment based on the multi-faceted undesirable effects of waste, governments at all levels must be aware of and regulate all forms of waste which are processed at the port environment as a result of shipping activities.³⁰⁵

3.2 Port Ship-Generated Waste and Management

One of the major sources of waste at the port is shipping activities apart from normal port operation. Although, the number of international legal regulations regulating ship-generated wastes have grown extremely in the recently , to the extent that if quantities were to be used as a guarantee of quality, most ports around the world would have become much free of waste than they appear at present.³⁰⁶ However, the problem of port waste management has in fact become more serious than ever in view of the negative effects of inadequate waste management by port authorities. There is variety in port ship waste-management depending on the ship type and purpose. Commercial ships often make port calls, resulting to offload of waste, and are functioned at nominal levels, which limits waste generation.³⁰⁷ Military ship contrast, since they make less port calls, and have both greater crew density and higher crew turnover rate. This, however, allow training and certification difficult.³⁰⁸

Therefore, regardless of the category of ship, or the idea of waste produced , the waste administration choices must accomplish treatment objectives, guarantee team security, and limit aggravation to the ship's activity whether military or commercial.³⁰⁹ Ports represent busy commercial, industrial and transport nodes, and they play an

³⁰⁴ Lewanski, R., 1992. Peter M. Haas, Saving the Mediterranean. The Politics of International Environmental Cooperation, Columbia University Press, New York, 1990, pp. 247. *Rivista Italiana di Scienza Politica*, 22(01), pp.167-169.

³⁰⁵ Ehlers, P.N., Borgese, E.M., Wolfrum, R. and Hoszlig, C. eds., 2002. *Marine Issues: from a Scientific, Political and Legal Perspective*. Martinus Nijhoff Publishers, pp.204-379.

³⁰⁶ Tan, A.K.J., 2005. *Vessel-Source Marine Pollution: The Law and Politics of International Regulation* (Vol. 45). Cambridge University Press.

³⁰⁷ Georgakellos, D.A., 2007. The use of The Deposit–Refund Framework in Port Reception Facilities Charging Systems. *Marine Pollution Bulletin*, 54(5), pp.508-520.

³⁰⁸ Ibid.

³⁰⁹ Gorycka, M., 2009. *Environmental risks of microplastics*. Stichting De Noordzee, Amsterdam, Netherland.

important economic role in the development of the host nations and regions.³¹⁰ Though over concentration of shipping activities in a small area leads to serious health hazards and the risk of environment deterioration because of the dumping of waste by ships.³¹¹

The existing major challenge for most ports is the provision of adequate reception facilities for ship-generated waste, and the lack of such facilities is a problem for many ship-owners.³¹² To avert the danger of environmental hazards in and around the port, it is essential also to address efficiently port waste reception facilities. Though, international conventions on the retention of waste on board ships for subsequent discharge to port reception facilities have been ratified by the countries, some substantial part of the ship-generated waste still ends up in the sea around the port.³¹³

Most of the waste generated in port might also slip back in quantities into to the seaport that at least can affect the local marine environment if not properly attended to.³¹⁴ The handling of waste in port goes through two main phases: collection and treatment. Waste is collected in every port and onboard all ships, yet only some types of waste are treated, and only to a certain extent in port and onboard ships.³¹⁵

3.3 Ship-Generated Wastes and it Impacts on the Marine Environment

Ship generates several types of waste, and the impact of such waste could be differing depending on how it affects the marine environment.³¹⁶ Ship-generated waste comprises of solid waste from ships, which might be same in structure to domestic

³¹⁰ De La Fayette, L., 2001. The Marine Environment Protection Committee: the conjunction of the Law of the Sea and international environmental law. *The International Journal of Marine and Coastal Law*, 16(2), pp.155-238.

³¹¹ Salomon, M., 2009. Recent European Initiatives in Marine Protection Policy: Towards Lasting Protection for Europe's Sea. *Environmental Science & Policy*, 12(3), pp.359-366.

³¹² Carpenter, A. and Macgill, S., 2001. Charging for Port Reception Facilities in North Sea ports: Putting theory into practice. *Marine pollution bulletin*, 42(4), pp.257-266.

³¹³ Versteeg, H.A., 1976. *The International and National Response to the Problems of Marine Pollution*. Auckland UL Rev., 3, p.209.

³¹⁴ Rakestraw, A., 2012. Open Oceans and Marine Debris: Solutions for the Ineffective Enforcement of MARPOL Annex V. *Hastings Int'l & Comp. L. Rev.*, 35, p.383.

³¹⁵ Akamangwa, N., 2013. *Global Environmental Regulation and Workers in the Shipping Industry* (Doctoral Dissertation, Cardiff University).

³¹⁶ Wade, B.A., 1997. The Challenges of Ship-Generated Garbage in the Caribbean. In *Marine Debris* (pp. 229-237).

waste and ship's cargo residues from ship's warehouse or tanker.³¹⁷ It often occurs in the wake of debarking, cleaning or washing of the ship's warehouse, deck or tanks, including the abundance spilled resulting from embarking and debarking operations.³¹⁸ Liquid wastes include waste greasing oil that supposed to be changed often to safeguard its greasing function.³¹⁹ The ship-generated waste could have negative impact if ineffectively managed. Solid waste from ship like plastic trash or food bags can cause boat/ship mishaps by folding over watercraft propellers or being sucked into the boat engines.³²⁰

Plastic waste from ship seems to have been the utmost firmly controlled waste from ship in the recent time due to its persistent nature.³²¹ A major challenge of keeping waste from plastic on-board often discover in most large number of plastic containers.³²² Notwithstanding, source decrease systems and on-board treatments have limited plastic waste transfer. Outstanding amongst other approaches to diminish plastic waste may be to decrease the sum utilised in any case.³²³ Dumping at sea has been the usual process that commercial ships have followed to remove packaging materials and other waste substance, though dumping of waste items at sea might not be new in the maritime industry.³²³ What has transformed in current years is that many more items are now seems to be made of plastic, like plastic bottle water, fruits and food waste etc. It is estimated that merchant ship disposes of 639,000 plastic containers at sea daily.³²⁴

Also, food waste constitutes one the largest single components of the waste stream from ship. It might constitute one of the most difficult wastes to deal with. In most

³¹⁷ Chen, C.L., 2015. Regulation and Management of Marine Litter. In *Marine Anthropogenic Litter* (Pp. 395-428). Springer International Publishing.

³¹⁸ Carlin, E.M., 2002. Oil Pollution from Ships at Sea: The Ability of Nations to Protect a Blue Planet. *Environmental Regime Effectiveness: Confronting Theory with Evidence*.

³¹⁹ Tan, A.K.J., 2005. *Vessel-Source Marine Pollution: The Law and Politics of International Regulation* (Vol. 45). Cambridge University Press.

³²⁰ Ibid.

³²¹ Ng, A.K. and Song, S., 2010. The Environmental Impacts of Pollutants Generated by Routine Shipping Operations on Ports. *Ocean & Coastal Management*, 53(5), pp.301-311.

³²² Maheim Jr, B.S., 1988. Annex V of the MARPOL Convention: Will It Stop Marine Plastic Pollution, pp.71. ³²³ Ibid.

³²³ Maheim Jr, B.S., 1988. Annex V of the MARPOL Convention: Will It Stop Marine Plastic Pollution.

³²⁴ Board, O.S. and National Research Council, 2009. *Tackling Marine Debris in the 21st Century*. National Academies Press.

cases, it can be direct discharged into the sea.³²⁵ If any treatment is conducted, it is arguably the usual process of maceration before discharge. Dumping of waste into the sea is not always appropriate, though, giving a significant waste management challenge in view of its characteristic nature, the percentage of waste with storage and handling, and quarantine requirements.³²⁶ Nonetheless, scholarly perception is that food waste remains just a minor constituent of waste generated from ships on daily voyage. The general lack of concern could be because of literature surveys of food ship-generated waste which often ignore it or gives only perfunctory coverage.³²⁷

Furthermore, other type of ship-generated wastes is wastewaters, which can further be categorised into non-oily wastewater and oily. Wastewater oily come from engine and equipment compartment such as pump rooms.³²⁸ Water oily from ship is regulated by the bilge water regulations in Annex I to the MARPOL 73/78. This can further be divided into contaminated and non-contaminated water sewage. Black water and grey water are well-defined by Rule 1, Annex IV of the MARPOL 73/78 Convention as oily or bilge wastewaters (often contaminated with oil and cargo residues, along with other pollutants metals such as chrome, arsenic, copper, lead and mercury).³²⁹

The sources of polluted wastewater onboard ship are mostly same as communities ashore. Annex IV to the MARPOL 73/78 Convention defines sewage in the following way: “ sustenance and other wastes from any form of toilets and urinals; drainage from medical premises (dispensary, sick bay, etc.) via wash basins, wash tubs and scuppers located in such premises; drainage from spaces containing living animals; other wastewaters when mixed with the drainages defined above (for example, a mix of sewage and grey water”.³³⁰

³²⁵ Polglaze, J., 2003. Can we Always Ignore Ship-Generated Food Waste? *Marine Pollution Bulletin*, 46(1), pp.33-38.

³²⁶ Butt, N., 2007. The Impact of Cruise Ship-Generated Waste on Home Ports and Ports of Call: A study of Southampton. *Marine Policy*, 31(5), pp.591-598.

³²⁷ Ibid.

³²⁸ Nickens, A.D., Pizzino, J.F. and Crane, C.H., 1997. Environmental Compliance: Requirements and Technology Opportunities for Future Ships. *Naval engineers journal*, 109(3), pp.349-369.

³²⁹ Ibid.

³³⁰ Brown, S.H., White, E.B., Pechulis, M. and Carman, R., 1999. Integrated liquid discharge system for waste disposal on future Surface combatants. *Naval engineers journal*, 111(3), pp.285-291.

Sewage can also be referred to as black water, and the dumping of ship sewage is regulated by MARPOL 73/78 Convention.³³¹ However, sewage on board ship not same as one generated from municipalities because of retention time and small water content. Hence, sewage from the ship dispose of directly into treatment plant; therefore, the amount of dissolved biochemical oxygen demand (BOD) is lesser to that of domestic systems and the washing procedure seems easier. The minor water capacity of the sewage on-board ship is more concentrated than the domestic sewage.³³²

Grey water contains non-sewage wastewater, and it incorporates drainage from showers, dishwashers, galleys, and washbasins. It likewise represents the biggest classification of liquid waste from cruise ships. The release of grey water is narrow by global legal regulation and in any occasion, it could be released specifically into marine environment. However, in some port areas like the UK berthing of the sewage and grey water must be deposited or treated because of its economic implication to port and its environment as it affects life span of the marine animals.³³³

Ballast water is also ship-generated waste which might become a threat to port due to its potential to transfer plants and animal species amongst diverse port visited by a ship. In view of this, the IMO has approved the introduction of intrusive species by ballast water as one of the overwhelming threats to port around world. Ballast can be described as 'any liquid or solid in a ship to balance the navigation of ship, to regulate change and control stability, or maintain stress loads within essential limits.'³³⁴ Hence, categorisation of ballast water for adequate management by port authorities falls into three groups: management before or during departure, en-route, and on arrival.³³⁵ Similarly, ballast water management should be thorough when designing any ship. Designing a ship to minimises the amount of ballast water would promote safe ballast

³³¹ Ibid.

³³² CONSTANT, A.E., 1975. Marine Pollution Control: Part Iii—Ship Design Requirements; The Design Approach. Naval Engineers Journal, 87(5), pp.47-55.

³³³ Ibid.

³³⁴ Hutto, L.B., 2001. A Comprehensive Guide to Shipboard Waste Management options. In OCEANS, 2001. MTS/IEEE Conference and Exhibition Vol. 1, pp. 295-301.

³³⁵ Parsons, Michael G., and Richard W. Harkins., 2002 "Full-scale Particle Removal Performance of Three Types of Mechanical Separation Devices for the Primary Treatment of Ballast Water. Marine Technology, 39. (4), pp. 211-222.

water change at sea, clean the ballast tanks, and helps implementing the management options.³³⁶

The goal of port ballast water waste management is to reduce the consumption of plant or animal species.³³⁷ Straightforward rules can be pursued to deal with the risk of taking on organisms. For example, not filling ballast water at the port or coastal areas when safe operating conditions cannot be assured. Thus, avoiding ballasts in port with high loads of sediments and sensible targeted organisms exist would help.³³⁸ There is also a chance that a management option could be created that would eradicate potential organisms as the water is loaded. Port management processes would need to guarantee competence even with high sediment loads as port environment most times have high concentrations of suspended material and ship do scrub sediment from the bottom during intake.³³⁹

The difficulty of adequately addressing port waste is worsened by the inherent and movement nature of the dumping. Ship could potentially devote substantial resources to handle a waste management problem it goes up against for a little extent of aggregate time at the port.³⁷¹ The process by which waste is treated commences from the period a notification is communicated by the ship captain about the amount and nature of waste to be dispose of. It is usually followed by the port reception, the transport system and the treatment in the suitable waste disposal.³⁴⁰ The economic solution of ship waste management is considered with a view to preparing pilot activities for management of non-oily and oily waste from ship.

³³⁶ Ibid.

³³⁷ Kaluza, P., Kölzsch, A., Gastner, M.T. and Blasius, B., 2010. The Complex Network of Global Cargo Ship movements. *Journal of the Royal Society Interface*, 7(48), pp.1093-1103.

³³⁸ Cohen, A.N., 1998. *Ships' Ballast Water and the Introduction of Exotic Organisms into the San Francisco Estuary: Current Status of the Problem and Options for Management* (p. 90). Richmond, CA: San Francisco Estuary Institute.

³³⁹ Gollasch, S., 1997. *Removal of Barriers to the Effective Implementation of Ballast Water Control and Management Measures in Developing Countries*. Report of GEF/IMO/UNDP Project, IMO, London. ³⁷¹ Hutto, L.B., 2001. A Comprehensive Guide to Shipboard Waste Management Options. In *OCEANS, 2001. MTS/IEEE Conference and Exhibition Vol. 1*, pp. 295-301.

³⁴⁰ Presburger-Ulniković, V., Vukić, M., Jančić-Heinemann, R. and Antonović, D., 2011. Ship Waste Quantities Prediction Model for the Port of Belgrade. *Chemical Industry and Chemical Engineering Quarterly/CICEQ*, 17(2), pp.239-248. See also, *Study on Ships Producing Reduced Quantities of Ships Generated Waste Present Situation and Future Opportunities To Encourage The Development Of Cleaner Ships* [file:///C:/Users/User/Downloads/prf-ems-a-final-report_rev10-07%20\(1\).pdf](file:///C:/Users/User/Downloads/prf-ems-a-final-report_rev10-07%20(1).pdf) (Assessed on 24, 2017).

3.4 Port Approach towards Ship-Generated Waste and Port Waste Management

Much has been said about the ship-generated wastes.³⁴¹ It is important to note that waste within the port could be prevented if port states would provide adequate treatment and reception facilities for ship-generated waste within and around the port. It requires dealing with ship-generated waste in accordance with the provisions of the principal international conventions to make the port free of waste ³⁴² The existence of all these conventions indicates that there is a system of rule that aims of reducing and preventing the dumping of waste to port by ship.

Most of these conventions have created a formal agency that flows from the global, regional and national levels to the major actors. In view of this, two kinds of actors are known to be ruled. The first one is the ports, which are ruled because they oversee that reception facilities are available.³⁴³ Secondly, ship-owners are ruled, because they must deliver the waste to the appropriate reception facilities rather than dumping it at sea, which can later find its way to port area. However, this research has indicated that the dumping of waste by ships coming to port is still an environmental problem. This is because initiatives by stakeholders at the national, regional and international level indicates that the systems of rule might not be sufficiently enough to control port and ship-owners. Hence, further research discovered that the problem might be associated with the lack of adequate control and implementation of the legal framework.³⁴⁴

The formal authority in this case is linked with the IMO and is limited, because in terms of implementing the IMO, it lacks the instruments to exert formal authority. It neither possesses direct tasks in the implementation of the conventions nor has the power to enforce regulation. The implementation of international law is in the hands of the national government, and the actual authority can be exercised by the IMO during the

³⁴¹ Olson, P.H., 1994. Handling of Waste in Ports. *Marine Pollution Bulletin*, 29(6-12), pp.284-295.

³⁴² Ball, Iwan., 1999 "Port Waste Reception Facilities in UK Ports Iwan Ball." *Marine Policy*, 23, (4), pp. 307-327.

³⁴³ Breitling, U. and Leader, G.T., 2010, August. Sustainable Shipping and Port Development. In 5th Regional EST Forum in Asia.

³⁴⁴ Ibid.

implementation of international agreements as an informal authority.³⁴⁵ In view of the above, it seems that port states have enormous responsibility for ensuring that their ports are free from ship-generated wastes irrespective of the authority that rules. Consequently, there seem to be three options available for the states to exercise in order to prevent ship-generated waste on port to preserve seaport environment:³⁴⁶

First, states may take measures as a flag state concerning their ships. As such, states can prevent national ships from discharging substances that are harmful to reduce waste. Flag states are answerable for guaranteeing their ships' compliance with appropriate safety, and environmental standards, as well as for vetting the documents and certificates issued under their authority.³⁴⁷ This duty demands that flag states should have the requisite domestic laws, administrative capability and qualified personnel who would inspect ships and promote crew competency. The duty also extends to investigating vessel accidents and taking appropriate regulatory and enforcement actions.³⁴⁸

Second, a state may exercise its authority to ensure that foreign flag ships visiting its ports follow the necessary domestic and international regulations. This authentication process, performed through port state control programmes has become significant because some ship owners and flag states have failed to effectively perform their oversight functions.³⁴⁹ As a consequence, a state may extend its facilities for the reception of operational waste from local ships to foreign ones coming to its ports.³⁵⁰

Third, a port might apply national provisions to ships navigating near its shores. National law covers territorial sea and applies to ships navigating there. Therefore, a

³⁴⁵ Molenaar, E., 1998. Coastal State Jurisdiction Over Vessel-Source Pollution (Vol. 51). Kluwer Law International.

³⁴⁶ Joyner, C.C., 2000. The International Ocean Regime at the New Millennium: A Survey of the Contemporary Legal Order. *Ocean & Coastal Management*, 43(2), pp.163-203.

³⁴⁷ Ocean Steward - Digital Library Of The Commons http://dlc.dlib.indiana.edu/dlc/bitstream/handle/10535/6857/ocean_full_report.pdf.txt;jsessionid=D50617EAD11C4C8C0B8ED3A34FA06D3E?sequence=3 (accessed on 28 December 2017).

³⁴⁸ Ibid.

³⁴⁹ Limiting Vessel Pollution and Improving Vessel Safety <http://studyres.com/doc/8914232/l-v-p-a> (Assessed on 24 June 2017) Additional reading; Breitling, U. and Leader, G.T., 2010, August. Sustainable shipping and port development. In 5th Regional EST Forum in Asia.

³⁵⁰ Molenaar, E.J., 2007. Port State Jurisdiction: Toward Comprehensive, Mandatory and Global Coverage. *Ocean Development & International Law*, 38(1-2), pp.225-257.

state may recommend the release of waste materials from any ship in its territorial sea, irrespective of its flag.³⁵¹

3.5 Impact of Ship-Generated Wastes in UK Ports

There are many ports in the UK that might be facing various degrees of challenges because of ineffective waste management. In this section the study will only discuss the problems of port waste management generally as it affects most ports in the UK. Seaports are complex systems, and quality shipping activities must be the goal that combines the aims of safety and port environment protection from ship-generated waste, as well as sustainability and economy.³⁵² The following are possible threats within shipping activities on the ports which can pose serious challenges to the port:³⁵³

- Shipping touches the environment in many complex ways through two unique ways: normal operation and accidents.³⁵⁴
- Ship accidents have secondary effects separately from the environmental impact, which also pose a straight danger to the life and health of humans, and cause loss or destructions of property within and around the port.³⁵⁵
- A third and less considered aspect of the impact of ship-generated waste could be related to shipping activities in the use of natural resources like fuel, and the conditions of constructing and re-cycling ships, which should be conducted and supervised with care.

The outline of threats and possible countermeasures are intended to provide an insight, while highlighting the serious challenges of the impact of ship-generated waste in the UK ports.³⁵⁶ The most noticeable operational impacts is direct pollution of the port by ships' waste substance, particularly through oily substance from engine room bilge and by cargo residues which have been well regulated in the past decades by

³⁵¹ Ibid.

³⁵² Butt, N., 2007. The Impact of Cruise Ship Generated Waste on Home Ports and Ports of Call: A Study of Southampton. *Marine Policy*, 31(5), pp.591-598.

³⁵³ Kennish, M.J., 2002. Environmental Threats and Environmental Future of Estuaries. *Environmental Conservation*, 29(01), pp.78-107.

³⁵⁴ Ball, I., 1999. Port Waste Reception Facilities in UK ports Iwan Ball. *Marine Policy*, 23(4-5), pp.307-327.

³⁵⁵ Ng, A.K. and Song, S., 2010. The environmental impacts of pollutants generated by routine shipping operations on ports. *Ocean & Coastal Management*, 53(5), pp.301-311.

³⁵⁶ Ibid.

international laws. Unfortunately, they still lead to challenge and the results of disobedience can be monitored in most of the UK ports, wherever oily substance and waste line up at the high-water mark.³⁵⁷

The operational impact of ship-generated wastes in the UK has led to international regulations of waste within the port. However, the extent of operational impacts of this depends mainly on the ship's types and size.³⁹⁰ The extent of disobedience to protective regulations also reflects on both the quality of the crew and the commercial pressure applied from ship operators on land. The significance of defensive procedures is not a complete number but hinge on on traffic concentration, on the local regeneration potential of port resources and on regional or local political interest. These relativities may be partly responsible for the reduce level of the current international environmental protection legal framework.³⁵⁸

The impacts from ship-generated wastes are well known through the publicity of oil associated pollution following nearly all major accidents, which include severe economic losses.³⁵⁹ The prevention of these accidents is crucial and should be demonstrate suitable legal framework, design of ship and equipment aim at regulating training of seafarers.³⁹³ However, from the environmental point of view, ship-generated waste can be considered as major sources of waste that has had an impact on both marine habitats and the port host community. Furthermore, the environmental impact of ship-generated waste has gradually become a significant research topic, where ship wastes frequently pose negative externalities to marine habitats and economic losses to coastal areas.³⁶⁰

³⁵⁷ Cole, S., Codling, I.D., Parr, W., Zabel, T., Nature, E. and Heritage, S.N., 1999. Guidelines for Managing Water Quality Impacts within UK European Marine sites. Swindon: Water Research Centre.

³⁹⁰Galdies, C., 2008. Ship-Generated Oil Discharges and Exhaust Emissions in the Mediterranean Basin: Their Distribution and Impact. PhD (editors). 2008, p.57.

³⁵⁸ Ibid.

³⁵⁹ McGonigle, R. Michael, R.,1981. Michael McGonigle, and Mark W. Zacher. Pollution, Politics, and International law: tankers at sea, pp. 567 ³⁹³ Ibid.

³⁶⁰ Ng, A.K. and Song, S., 2010. The Environmental Impacts of Pollutants Generated by Routine Shipping Operations on Ports. *Ocean & Coastal Management*, 53(5), pp.301-311.

The impact of ship-generated waste at the UK port includes; solid waste, air discharges, ballast water, water waste and hazardous waste.³⁶¹ Thus, the research projected a regular ship will generate some percentage of 1 kg of solid waste along with two cans bottles a day per passenger and some ton of sewage (black water) per day. This can impact the marine environment negatively if it is not properly managed. Although, no recent studies outline the negative impact of waste at the port in the UK,³⁹⁶ nevertheless ship-sourced food waste has been identified as another waste that can impact negatively within the port.

It can decrease water and residue quality, unfavourably influence marine creatures, increment turbidity and enhance supplement levels. In addition, food waste particles may affect fish ingestion and health, and they have unsuitable nutrient content.³⁶² Frequent and adequately large immunizations to an area may breed ecological changes that may change to modifications in the behaviour pattern of community species. Based on the authority of Article 4(2) EU Directive 2000/ 59³⁶³ that port should provide adequate waste management reception facilities to help manage the amount of waste ship-generated. Thus, the way and manner port handles waste to avoid negative effect of it will be closely connected and work out with the domestic legislations.³⁶⁴

The generation of maritime waste due to shipping activities may prompt both common harm and monetary misfortunes to port state, as particularly when gathered after some time, they cause unmistakably more negative externalises than vast scale, effectively noticeable contamination waste produced by ship.⁴⁰⁰ The impact of ship-generated waste in the UK port may come in many ways and produce much impacts on the port

³⁶¹ Sheavly, S.B. and Register, K.M., 2007. Marine Debris & Plastics: Environmental Concerns, Sources, Impacts and Solutions. *Journal of Polymers and the Environment*, 15(4), pp.301-305. ³⁹⁶ Ng, A.K. and Song, S., 2010. The Environmental Impacts of Pollutants Generated by Routine Shipping Operations on Ports. *Ocean & Coastal Management*, 53(5), pp.301-311.

³⁶² Polglaze, J., 2003. Can We Always Ignore Ship-Generated Food Waste? *Marine Pollution Bulletin*, 46(1), pp.33-38.

³⁶³ Article 4(2) Eu Directive 2000/ 59.

³⁶⁴ Carpenter, A. And Macgill, S.M., 2000. The New Eu Directive on Port Reception Facilities for ShipGenerated Waste and Cargo Residues: An Evaluation. *Wit Transactions on The Built Environment*, 51. ⁴⁰⁰ Sheavly, S.B. And Register, K.M., 2007. Marine Debris & Plastics: Environmental Concerns, Sources, Impacts and Solutions. *Journal of Polymers and The Environment*, 15(4), pp.301-305.

environment.³⁶⁵ Nowadays, the impact of ineffective port waste management on marine ecosystems is that wastes, like cargo residues, wastewater, (minerals, grain, salt, sugar, etc.), and ship-source litter.³⁶⁶

Depend on the nature and amount of waste, the effects on marine environments range from marine wildlife loss owing to the ingestion of or entanglement in marine waste.³⁶⁷ Research indicates that many marine species have died due to ingestion of marine garbage, particularly plastics, either due to misjudgement of litter as its characteristic prey or coincidentally amid encouraging and other ordinary practices. Ingestion can prompt physical harm with its chemical consequences. For instance, chemicals incorporated in or attracted to plastics are potentially toxic, with hormone disrupting effects due to the ingestion.³⁶⁸ Hence, due to various reasons, notably, the largely unnoticeable character and relatively isolated nature of the maritime industries, waste at the port has beginning to get special attention it deserves from the various stakeholders within the maritime industry.³⁶⁹

Consequently, the aim of the British Ports Association (BPA) appears to advance environmental alertness among port workers. This stems from the increasing administrative pressures to overhaul most port administrator for safety reasons.³⁷⁰ The UK government has maintained reasonable environmental standards and invested in future port development programme. Port authorities are expected to strategize their statutory duties to encourage social and environmental duties at the same time, implementing social corporate responsibility (SCR) in port waste management schemes. Where appraisals feature adverse impacts, moderation needs management

³⁶⁵ Thompson, R.C., La Belle, B.E., Bouwman, H. And Neretin, L., 2011. Marine Debris: Defining A Global Environmental Challenge. Unep Science and Technical Advisory Panel (Stap). Advisory Document.

³⁶⁶ Van Franeker, J.A., 2010. Fulmar Litter Ecoqo Monitoring in The Netherlands 1979-2008 In Relation to Eu Directive 200/59/Ec On Port Reception Facilities (No. C027/10).

³⁶⁷ Gregory, M.R., 2009. Environmental Implications of Plastic Debris in Marine Settings Entanglement, Ingestion, Smothering, Hangers-On, Hitch-Hiking and Alien Invasions. *Philosophical Transactions of The Royal Society of London B: Biological Sciences*, 364(1526), pp.2013-2025.

³⁶⁸ Ryan, P.G., Moore, C.J., Van Franeker, J.A. And Moloney, C.L., 2009. Monitoring the Abundance of Plastic Debris in The Marine Environment. *Philosophical Transactions of The Royal Society of London B: Biological Sciences*, 364(1526), Pp.1999-2012.

³⁶⁹ Hilaire, A., 2007. An Analysis of Cruise Tourism in The Caribbean And Its Impact on Regional Destination Ports.

³⁷⁰ Kuznetsov, A., Dinwoodie, J., Gibbs, D., Sansom, M. And Knowles, H., 2015. Towards A Sustainability Management System for Smaller Ports. *Marine Policy*, 54, Pp.59-68.

designs to preserve and safeguard open access to features of natural beauty or place historic interest.³⁷¹

3.6 Impact of Ship-Generated Wastes in Nigeria Port

Nigeria is a developing country, with numerous natural resources but seems susceptible to environmental degradation in most of her ports across the country.³⁷² A typical example of this degradation is ineffective port waste management in her ports. Prior to the establishment of the Environment Impact Assessment (EIA) Decree No. 86 of December 1992 (Federal Republic of Nigeria 1992a),³⁷³ detailed analyses of the bio-physical and socio-economic effects of main developmental schemes were to a certain extent fragmented, ad hoc or obviously non-existent.³⁷⁴ Encouraged by rising environmental alertness in different parts of the world, EIA is recognised as an instrument for much perfect protection of environmental and management of port at the national stage became more evident around early 1980s.³⁷⁵

The Nigerian Ports Authority (NPA) is the body that manages sea ports in Nigeria. In the opinion of Igboke, the following are the major problems of the Nigerian ports about waste management system:³⁷⁶

- A malfunctioning port system: the Nigerian ports framework is static and failing with port blockage and disruption of the production activities in the economy. On one occasion, more than 450 ship waited t for up to 180 days to berth when the globally acknowledged period is 10 days.³⁷⁷ In other words, ships often

³⁷¹ Ibid.

³⁷² Akinbami, J.F., Akinwumi, I.O. And Salami, A.T., 1996, November. Implications of Environmental Degradation in Nigeria. In *Natural Resources Forum* (Vol. 20, No. 4,). Blackwell Publishing Ltd. pp. 319-332.

³⁷³ Environment Impact Assessment (EIA) Decree No. 86 Of December 1992.

³⁷⁴ Olokesusi, F., 1998. Legal and Institutional Framework of Environmental Impact Assessment in Nigeria: An Initial Assessment. *Environmental Impact Assessment Review*, 18(2), pp.159-174.

³⁷⁵ Environmental Awareness Safety E-Learning Course http://www.business-safety.com/elearning/course-library/environmental-awareness/?gclid=CMHOUKee29QCFaK_7QodR74JDg (Assessed on 24 June, 2017). See also, Huang, P.S. and Shih, L.H., 2009. Effective Environmental Management Through Environmental Knowledge Management. *International Journal of Environmental Science & Technology*, 6(1), pp.35-50.

³⁷⁶ Orji, U.J., 2012. Applying E-Maritime Initiatives to Enhance Productivity in the Nigerian Maritime Industry: The Need for an Enabling Policy and Legal Environment. *Bus. L. Rev.*, 33, p.262.

³⁷⁷ Ibid.

have to wait more than usual to berth, particularly at the Lagos ports due to inadequate space to unload cargo and stack containers.

- Failure by the government or Nigeria Ports Authority to use existing data to update the plans for the port in the face of the growing amount of ship generated waste to avert port environment degradation.
- Uneven tariff system: For waste disposal at port and the amount of clearing containers or exported cargoes, the tariffs are different in most port in Nigeria. For example, Apapa port tariff is not same with the rest of the nation's port. This might be due to high tonnage at the port.
- A culture lack of maintenance: The port management as well as the operators of port infrastructure and equipment lack the appropriate maintenance system. Their perception is that the government own infrastructure and equipment are not supposed to managed or should be given little or no attention private enterprise. This practise has led to most port infrastructure and equipment becoming obsolete.
- Government conflict guidelines in relation to ports activities or services: The government enacts certain rules to check port activities. The inconsistency of such policies o rules might lead to a change or removed as government changes, which hinders the efficacy of the ports' waste management systems.

Therefore, it can be deduced that an effective port management waste system is a panacea to the smooth running of the various functions of the port systems.³⁷⁸ It includes cargo handling, harbouring of ship, risk assessment, pilotage, clearing and forwarding, allocating anchorages, billing of cargo, warehousing, maintaining berths, supplying pilotage tug boats, providing safety services, maintaining the channel to be navigable. It also includes collecting and disposal of sewage and garbage wastes.³⁷⁹

³⁷⁸ Garnwa, P., Beresford, A. and Pettit, S., 2009. Dry ports: a Comparative Study of the United Kingdom and Nigeria. *Development of Dry Ports*, 40.

³⁷⁹ Oghojafor, B.E., Kuye, O.L. and Alaneme, G.C., 2012. Concession as a Strategic tool for Ports Efficiency: An Assessment of the Nigerian Ports. *American Journal of Business and Management*, 1(4), pp.214-222.

Ports waste management entails ensuring and maintaining port systems that are conducive for port operators and ensure that shipping operations are not interrupted.

In Nigeria, the impact of waste at the port cannot be overstressed due to the challenge to marine life which is recognised as one of the most noteworthy natural concerns. While, there are numerous wellsprings of port pollution, one is worried about the ship-generated waste. The sorts of waste created in ship and dumped inside ports have affected marine environment for quite a long time. Marine waste negatively affects port activities. This is particularly problematic in regions that have been identified as Special Areas, which have stricter prerequisites on waste control and have inadequate infrastructures on port reception facilities to handle the increased amount of waste.³⁸⁰

Thus, regardless on the type of the waste, international conventions determine the nature of its disposal. The legal regulations apply wherever vessel from member nations of MARPOL travel (MARPOL being the major international convention administering ship-generated waste). However, the port waste will continue to affect the marine environment unless efficient and appropriate waste disposal schemes are put in place in affected ports.³⁸¹

3.7 Impact of Ship-Generated Wastes on Ports of Call

This section will focus on ports of call, which a ship occasionally uses during normal operations. A port of call can be defined as an intermediate stop of a ship on its scheduled journey to unload and load or take supplies or fuel.³⁸² While the term ports is broad and generally include facilities and amenities feasible to people and cargo, a port of call has different meaning and interpretation.³⁸³ Ports of call represent a part of the sub-divisions to the broader term 'ports' and are used for all types of ships.³⁸⁴ Port of call is thus a technical term used in all official shipping documents. On the other hand, a home port can be defined as the port that a ship returns to after it has finished travelling or transporting goods somewhere, and where a ship is registered as its

³⁸⁰ Ibid.

³⁸¹ Chircop, A., 2002. Ships in distress, Environmental threats to Coastal States, and Places of Refuge: New Directions for an Ancient Regime. *Ocean Development & International Law*, 33(2), pp.207-226.

³⁸² Keupp, M.M. and Schöb, R., 2015. The potential of container vessel operation on the Northern Sea Route: Nautical, regulatory, and operative issues. In *The Northern Sea Route* Springer Gabler, Wiesbaden. pp. 53-68.

³⁸³ <https://dictionary.cambridge.org/dictionary/english/home-port> (assessed on 12 December 2017).

³⁸⁴ <https://www.collinsdictionary.com/dictionary/english/home-port> (assessed on 12 December 2017).

official records are kept as shown in its registration documents.³⁸⁵ Ports of call appears to face same challenges like that of the UK and Nigeria has outlined earlier, and the majority of them apply similar measures like the home ports to ensure adequate discharge of ship-generated waste without triggering environmental hazards to ports and host communities of that region.³⁸⁶ Ports of call more often not receive and handle a large volume of ship-generated waste from ship, which is might be due to their strategic location.

The ship-port interface can be recognised as serious aspect of reducing unlawful dumping of ship-generated waste and cargo residues into the sea, via the provision of port waste reception facilities.³⁸⁷ This might be complex due to many factors directing and controlling port-related and ship related waste, while contemplation of prevention, recovery and disposal also requires to be considered. On the other hand, in recent times nations have discovered, or have tried to find, ways to circumvent some international legal regulations considered to be inadequate in addressing the remote cause of the problem of ship-generated waste by exercising their capacity as a port of call, rather than as port states.³⁸⁸

Therefore, nations are not allowed under the international legal regulation to control ship that pass along their coastlines, nations may place conditions that enter its port voluntarily.³⁸⁹ It is obvious such condition would have to be met at the ports of call. However, this type of condition is often designed following serious accidents to increase regulation at the port. Although ship-generated waste may have contributed in no small measure to the overall port waste pollution and land-based waste coming into the port. It is the prominent environmental threat that increased the awareness of

³⁸⁵ <https://www.merriam-webster.com/dictionary/port%20of%20call> (assessed on 12 December 2017).

³⁸⁶ 3.2 Port Ship-Generated Waste and Management.

³⁸⁷ Georgakellos, D.A., 2007. The Use of the Deposit–Refund Framework in Port Reception Facilities Charging Systems. *Marine Pollution Bulletin*, 54(5), pp.508-520.

³⁸⁸ Ibid.

³⁸⁹ Ringbom, H., 1999. Preventing Pollution from Ships–Reflections on the Adequacy of Existing Rules. *Review of European, Comparative & International Environmental Law*, 8(1), pp.21-28.

the international community on the challenges of port ship-generated waste management.³⁹⁰

Nevertheless, the source of ship-generated waste never stops attracting international attention as a result of occasional incidents affecting the port environment. This is due to nature and characteristics of ship-generated waste, which are so conspicuous and impossible for port users to ignore.³⁹¹ Besides the conspicuousness of ship-generated waste, it is a global challenge instead of a national one as in the case of land-based waste. This is essentially because the ocean physically interfaces the nations and distinctive landmasses with unbreakable and multi-directional connections. Thus, at the port environment, irrespective where waste originates from, the high seas or from a territorial port, it often produces repercussions at the international level.⁴²⁸

Considering the international characteristic of ship-generated waste, it is therefore clear that legal regulation on port waste management protection started from the prevention and control of such waste from ships in order to avert environmental degradation. Although, waste can be characterised by several pollutants, legal regulations are adapted to the circumstances according to the way in which the waste occurs. It might be a reasonable way for ship waste to be characterised to make differences between fortuitous and human intervention due to entry of waste at the port environment.³⁹²

3.8 Operational Discharge of Ship-Generated Wastes at Port

Operational discharge of waste by ship in port usually appears to involve human intervention.³⁹³ While, accidental discharge of waste is as a result of unavoidable events, operational discharge of waste is generated from the regular and typical ship operational exercises at the port environment, regardless of whether the ship is

³⁹⁰ Anderson, A.W., 1975. National and International Efforts to Prevent Traumatic Vessel Source Oil Pollution. U. Miami L. Rev., 30, p.985.

³⁹¹ Kindt, J.W., 1984. Vessel-Source Pollution and the Law of the Sea. Vand. J. Transant'l L., 17, p.287.

⁴²⁸Bodansky, D., 1991. Protecting the Marine Environment from Vessel-Source Pollution: UNCLOS III and beyond. Ecology LQ, 18, p.719.

³⁹² Ibid.

³⁹³ König, D., 2000. Erik Jaap Molenaar, Coastal State Jurisdiction over Vessel-Source Pollution (The Hague: Kluwer Law International, 1998), 632 pages. Yearbook of International Environmental Law, 10(1), pp.823-826.

moving or at anchor or alongside.³⁹⁴ Ship- discharge operational includes but are not limited to chemicals and other noxious waste substances. Moreover, when a ship is utilised for conveying synthetic substances and different poisonous waste substances as cargo, wastes will always remain after the cargo is removed.³⁹⁵ The most advantageous and least expensive approach to discharge those wastes and clean the tanks may be to utilise port water. Those chemical materials usually pose a serious threat to the port environment and the host community around the port.³⁹⁶

On the other hand, while operational dumping of waste is caused by need and is unavoidable, there is another sort of intentional activity through which waste enters the port environment, and that is illegal waste dumping near port.³⁹⁷ The discharge of waste in port water is wilful and controllable; it is a purposeful activity which is discernible from operational discharges at the port.³⁹⁸ The difference lies in their purposes as for the port waste discharge, it seems that the major aim of ship carrying wastes from land will be to dump them into the sea. They are purposefully utilising the sea as a natural waste archive for the undesirable waste and effluents at the port.³⁹⁹ The waste on board is inevitable, then, disposal of such waste into the sea can be regulated via containment onboard or by setting some permitted measure for its discharge based on technology.⁴⁰⁰

On the other hand, many scholars have demonstrated that there is a contrast in between efficiency and compliance in terms of waste management at the port, since compliance does not automatically ensure effectiveness.⁴⁰¹ The efficiency is

³⁹⁴ Schachter, O. and Serwer, D., 1971. Marine Pollution Problems and Remedies. The American Journal of International Law, 65(1), pp.84-111.

³⁹⁵ Trozzi, C. And Vaccaro, R., 2000. Environmental Impact of Port Activities. WIT Transactions on The Built Environment, 51.

³⁹⁶ Ibid.

³⁹⁷ Chen, C.L., 2015. Regulation and Management of Marine Litter. In Marine Anthropogenic Litter. Springer International Publishing. pp. 395-428.

³⁹⁸ Siung-Chang, A., 1997. A Review of Marine Pollution Issues in The Caribbean. Environmental Geochemistry and Health, 19(2), pp.45-55.

³⁹⁹ Mohee, R., Surroop, D., Mudhoo, A. And Rughooputh, B.K., 2012. Inventory of Waste Streams in An Industrial Port and Planning for A Port Waste Management System as Per ISO14001. Ocean & Coastal Management, 61, Pp.10-19.

⁴⁰⁰ Ibid.

⁴⁰¹ Victor, D.G., Raustiala, K. And Skolnikoff, E.B. Eds., 1998. The Implementation and Effectiveness of International Environmental Commitments: Theory and Practice. MIT Press.

unarguably something above a mere adherence to legal responsibilities, under the international law of the sea. It can be assumed that when the environmental condition of the port is greatly improved in line with the various international conventions. Exploring the effectiveness of environmental legal regulation on port waste management involves a systematic pragmatic policy to help port in waste management.⁴⁰²

Although, the availability of adequate waste reception facilities to cater for ship residues has been analysed, it is significant to note that reception facilities at the port might still be a debatable issue among players in the maritime sector.⁴⁰³ The response to this argument is simply that the majority of the countries involved did not have enough capacity or resources to provide for such facilities, hence the constant gap in adhering fully to the provisions of various international regulations as regards waste management at the port.⁴⁰⁴ Another obvious problem of the conventions on port waste management is the reluctance to provide sanctions in cases where there is inadequate provision of waste reception facilities.⁴⁰⁵

Nevertheless, there must be facilities at the port for accepting waste retain in the ship, and this is imperative to the overall success of port waste management. Similarly, the establishment of an appropriate implementation is probably the main challenge for the enforcement of the various regulations on port waste management.⁴⁰⁶ However, the enforcement of a highly technical regulation like MARPOL requires both expertise and sophisticated equipment, which it seems many ports across the globe do not have the willingness or capacity to possess.⁴⁰⁷

Ports waste management covers a wide range of disposed of materials running from ship-generated waste, electrical and electronic, industrial and agricultural, to new

⁴⁰² Ibid.

⁴⁰³ Ferraro, G. and Pavliha, M., 2010. The European and International Legal Framework on Monitoring and Response to Oil Pollution from Ships. *Journal of Environmental Monitoring*, 12(3), pp.574-580.

⁴⁰⁴ Ibid.

⁴⁰⁵ Ringbom, Henrik.,1999 "Preventing Pollution from Ships–Reflections on the Adequacy of Existing Rules." *Review of European Community & International Environmental Law* 8, (1), pp. 21-28.

⁴⁰⁶ Carlin, E.M., 2002. Oil pollution from ships at sea: The ability of Nations to Protect a Blue Planet. *Environmental Regime Effectiveness: Confronting Theory with Evidence*.

⁴⁰⁷ Ibid.

types including counterfeit pesticides.⁴⁰⁸ It also includes anything in size and scale, from decommissioned ships waste downwards. With the growth worldwide populace, urbanisation and utilisation, the volume of waste keeps on expanding, providing huge environmental, social, health, economic and even criminal challenges of unknown proportions.⁴⁰⁹ As a result of higher costs of waste management, disposing of wastes, erratic environmental regulations, weak enforcement and little environmental awareness, the ineffectiveness port waste management and the trans-boundary movements of hazardous wastes continues unabated. Despite the different measures undertaken in the various legal frameworks, the detailed knowledge of port waste flows remains limited and at best fragmented.⁴¹⁰

Without any important implementation strategies devoted to mapping out, investigating and prosecuting criminals engaging in illegal waste dumping at the port, the condition will only worsen. The challenge of waste collection may likely to increase, and illegal waste dumping are likely to grow due to lack of effective implementation of regulation by member state.⁴¹¹ The absence of sound waste management includes its dumping, follow by an illegal trans-boundary movement. It may have severe implications for the port environment and human; subsequently, clean-up may well be an economic burden.⁴¹²

Furthermore, more often than not, shipping agents, terminal administrators and shipping companies play an important role in port waste management.⁴¹³ Shipping agents provide logistical support and arrange the paperwork, providing all necessary shipment information and the quantity of waste to be disposed of by ship.⁴¹⁴ Most

⁴⁰⁸ Bang, H.S., 2013. Recommendations for Polices on Port State Control and Port State Jurisdiction. *J. Mar. L. & Com.*, 44, p.115.

⁴⁰⁹ Galley, M., 2014. Legislation. In *Shipbreaking: Hazards and Liabilities* (pp. 59-98). Springer International Publishing.

⁴¹⁰ <https://www.gov.uk/government/news/waste-dealer-jailed-for-16-months-after-dangerous-shipments-stopped-at-port>. (Assessed on the 13 December, 2017).

⁴¹¹ Tomkins, K., 2004. Police, law enforcement and the environment. *Current Issues Crim. Just.*, 16, p.294.

⁴¹² Rucevska, I., Nelleman, C., Isarin, N., Yang, W., Liu, N., Yu, K., Sandnaes, S., Olley, K., McCann, H., Devia, L. and Bisschop, L., 2015. *Waste Crime–Waste Risks: Gaps in Meeting the Global Waste Challenge*.

⁴¹³ Heaver, T.D., 1995. The Implications of Increased Competition Among Ports for Port Policy and Management. *Maritime Policy and Management*, 22(2), pp.125-133.

⁴¹⁴ *Ibid.*

⁴⁵² *Ibid.*

times, important to process the shipping activities such as the destination is concealed. In such cases, therefore, it might be a challenge for port operators to know exact distance the ship has been covered, in order to ascertain the quantity of waste generated. However, on the other hand, shipping operators may contend that lack of accurate information about the cargo they ship, hence the laxity in communicating properly the distance the ship will cover.⁴⁵²

For example, in UK, the first case where a person was sentenced to a prison for waste related offences was not concluded until May 2014. An authorised waste processor was imprisoned for 16 months by a UK court for illicitly sending out 46 tons of hazardous waste to Nigeria, Ghana, and different parts of Africa.⁴⁵³ Government Agents uncovered that the respondent had been gathering waste from various council run sites in the London zone and redirecting same to his authorised waste premises.⁴⁵⁴ Rather than handling the waste legitimately, he stacked four holders of things including cathode beam TVs and ice chest coolers with high ozone-exhausting substances to representatives and transportation firms who at that point traded the loss to West Africa.⁴¹⁵ He contended that he test the items appropriately for usefulness and even put "test" names on them. On assessment, these items were not observed to work in spite of the names proposing something else.⁴⁵⁶

Furthermore, the "testing" labels were missing, and none was protectively wrapped. The Environment Agency (EA) revealed that the defendant made a benefit of about USD 12,000 from each container. It pointed out that this kind of export business is not a victimless offence. The container contained variety of hazardous materials and ozone-draining substances that can have genuine negative effects on the health and environment of the receiving nations if not recycled in an eco-friendly manner.⁴¹⁶ In 2012, after a three-year examination by the EA, the respondent and numerous other

Rucevska, I., Nelleman, C., Isarin, N., Yang, W., Liu, N., Yu, K., Sandnaes, S., Olley, K., McCann, H., Devia, L. and Bisschop, L., 2015. Waste Crime–Waste Risks: Gaps in Meeting the Global Waste Challenge. ⁴⁵³ ⁴⁵⁴ Ibid.

⁴¹⁵ Rrawastecrime screen by Ana Domingues (page 42)

https://issuu.com/anadomingues0/docs/rrawastecrime_screen/42 (Assessed on 24 June 2017).

⁴⁵⁶Yao, Q. and Xu, L., 2015, April. Strategies on Prevention of Pollution from Rotary-Molded Boat of the Marine Environment. In 2015 International Conference on Automation, Mechanical Control and Computational Engineering. Atlantis Press.

⁴¹⁶ Ibid.

waste merchants, processors, and shippers were sentenced and fined a sum of more than USD 30,000 for different exercises associated with illicit waste exports. The respondent was in the process of appealing against the sentence, when he was caught in a comparable offence. Unfortunately, at the time of conducting this research, the author is yet to find clear cases of waste offenders in Nigeria who have been tried and convicted.

3.9 Summary

In summary, the solutions to the problems of port waste management vis-à-vis ship-generated waste warrant action or initiatives at the international, regional and national level. Port authorities normally have comprehensive supervisory authorities concerning port waste management.⁴¹⁷ The port authority is in charge of enforcing various legal regulations and conventions at the port, it also ensures compliance with conventions and laws to promote public safety and security, and port navigation procedure. Port also promotes local legislation, comprise of rules and regulations with regards to the behaviour of ship at the port, use of port areas, and other issues. Often, extensive police powers are also assigned to the port authority.

As emphasised above, the IMO conventions related to port waste management are based on reactive rule-making. It seems that most of these conventions or their amendments have been initiated due major waste or pollution incidents. In view of this, the conventions never seem to attract or generate the attention they deserve from some countries even in the face of port degradation owing to inadequate reception facilities and waste management within the port. The conventions very often fail to address the root causes of the ship-generated waste, such as negligence, poor maintenance and inadequate training. Often, the adoption of the convention is simply to satisfy the immediate environmental activism of the most affected areas while less affected ones are not well catered for.

Another challenge perhaps not properly addressed by the various conventions is the funding for countries that do not have enough capacity to provide the huge amount of money required to facilitate the provision of waste reception facilities within their ports.

⁴¹⁷ Moglia, F. and Sanguineri, M., 2003. Port Planning: The Need for a New Approach? *Maritime Economics & Logistics*, 5(4), pp.413-425. See also, Brooks, M.R., 2004. The governance Structure of Ports. *Review of Network Economics*, 3(2).

There have been calls for the IMO to develop a system within the existing legislation to compel the governments of individual countries to support adequate provision of port waste facilities in order to reduce port waste movement into international water. It is therefore important, apart from the money generated by port operators from shipowners discharging their wastes at the port that the facilities should meet the expectation of the port users. In view of the observation, the next chapter will discuss the UK and Nigeria ports waste reception facilities for in-depth analysis.

CHAPTER 4

PORTS WASTE RECEPTION FACILITIES IN THE UK AND NIGERIA

4.1 Introduction

The aim of this chapter is to address the challenges of port waste reception facilities and compliance with the use of such facilities at the ports in the UK and Nigeria. This will reveal the existing gaps in compliance with port waste reception facilities in the UK and Nigeria. It is also worth noting that there are regulations with regard to port waste management, this has not been translated to the desired results as far as port waste reception facilities are concerned. Hence, this chapter looks at port waste reception facilities and the methods adopted by UK and Nigerian ports to control ineffective waste management at the port.

4.2 Port Waste Reception Facilities

Port waste reception facilities concern the organisation of activities and operations specifically aimed at attaining high standards of port protection and sustainable development. Thus, the high standards would be the provision of adequate and affordable use of facilities at the port by each country. This will depend on the commitment channels by the Government towards ensuring waste reduction at the port. This might include financial contribution towards acquiring new technologies for waste collection, policy formulation to strengthen port waste management and reduction of traffic at the port for quick waste delivery by ship etc.⁴¹⁸

The identification of these key performance indicators would enable port authority to evaluate its achievement, and adequate monitoring to assess both the efficacy of port waste management and the quality of the port area itself.⁴¹⁹ However, authors have identified two significant trends in port waste reception facilities, which have evolved over the years. The first is policy-based and involves ports collaborating on the topic

⁴¹⁸ Carpenter, A. and Macgill, S., 2001. Charging for port reception facilities in North Sea ports: Putting theory into practice. *Marine pollution bulletin*, 42(4), pp.257-266.

⁴¹⁹ Pinder, D. and Slack, B. eds., 2000. *Shipping and Ports in the Twenty-first Century*. Routledge.

of waste management as a pre-competitive issue, with a view to sharing knowledge and way out on port waste management⁴²⁰

While the second is technology and improved information, this concerns the use of information processing for the integration of port waste reception facilities. It also relates to the integration and data monitoring within port waste environmental management information systems.⁴²¹ However, most seaport might be considered unique in the order of not just only its geographical, hydrographical, but also commercial profile. In addition, the diversity of form and function can further be compounded for considerations.⁴²²

The implication would mean that the port waste reception facilities and human capacity should be fitted to the exceptional conditions of each port, and without the adaptable instruments, port may not have the structures to execute waste management at the port.⁴²³ The manner at which most ports in the world are trying to create community, in-house waste administration, as an option in contrast to enactment driven methodologies, demonstrates the significance of the waste issue to the port division as a factor inside port risk.⁴²⁴

Although the test for some seaports remain, making an interpretation of theoretical procedures are connected to waste management framework.⁴²⁵ There is also an awareness among port directors on the threat intrinsic in the ineffective waste management, and port exercises. Port authorities are assuming an undeniably self-motivated job in port administration activities.⁴²⁶ In any case, there are a few second thoughts with regards to the most fitting type of waste administration choice to seek

⁴²⁰ Pinder, D. and Slack B., 2004 "Contemporary Contexts for Shipping and Ports." in *Shipping and Ports in the Twenty-First Century: Globalization, Technological Change and the Environment*. New York: Routledge, pp. 1-22.

⁴²¹ Allen, R., 1996. *The Environmental Consequences of Port Development*. Samara Publishing Ltd., Cardigan (UK). 1996.

⁴²² Wooldridge, C. and Stojanovic, T., 2000. 10 Integrated Environmental Management of Ports and Harbours. *Shipping and Ports in the Twenty-first Century*, p.191.

⁴²³ Ibid.

⁴²⁴ Acciaro, M., 2015. Corporate Responsibility and Value Creation in the Port Sector. *International Journal of Logistics Research and Applications*, 18(3), pp.291-311.

⁴²⁵ Hoyle, B.S., 1996. Cityports, Coastal Zones and Regional Change. *International Perspectives on Planning and Management*, (2nd edn 2002 Chichester, UK) pp.235-248.

⁴²⁶ Ibid.

after in regulating waste at the port. From one viewpoint, port improvement and business require port natural security, and port directors to have a waste inclination for non-bureaucratic and financially practicality in port waste administration.⁴²⁷

Integrated port waste management has been viewed as a way to deal with accommodating clashing interests and worries to facilitate institutional activities and divided activities.⁴²⁸ It looks to incorporate procedures of arranging and basic leadership with parts of waste administration that affects assessment and port efficiency. It typifies various ideas and core values that can make the fruitful execution of port waste administration. It energizes the choice of important methodologies thorough or steady to empower ports to concentrate on remarkable waste administration parts of port exercises.⁴²⁹

An integrated approach is essential to undertake a strategic valuation of waste risks. Nowadays, people generally recognise that there are esteem advantages for port users in adopting a coordinated strategy towards port waste administration, and the idea of waste difficulties at the port setting.⁴³⁰ Different regular operational exercises, for example, freight dealing with, digging and waterfront releases impacts affect arrive, water, suspended residue and air. The importance of port waste management aspect cannot be over-emphasised, and this is because wastes and their effects can be trans bounded if it is not managed properly.⁴³¹

Port authorities are landlords within the city due to human activity that often takes place at the port.⁴³² This illustrates the fact that both international law of sea and the national laws of the land are of relevance to ports. Responsibility and liability may be

⁴²⁷ Smith, H.D. and Potts, J., 2005. Managing Britain's Marine and Coastal Environment: Towards a Sustainable Future (Vol. 10). *Psychology Press*, pp.2-68.

⁴²⁸ Ibid.

⁴²⁹ Bert, R., Book Review: *Shipping and Ports in the Twenty-First Century: Globalisation, Technological Change and the Environment*, edited by David Pinder and Brian Slack, London: Routledge, 2004. *Civil Engineering—ASCE*, 74(9), pp.71-71.

⁴³⁰ Ibid.

⁴³¹ <http://www.portoframsgate.co.uk/port-publications/port-and-harbour-waste-managementplan/annex-d/> (Assessed on 6 March 2018).

⁴³² Olukoju, A., 2008. Port Development and Modernisation on the West African Atlantic Coast in the Twentieth century. *Coloquios de Historia Canario Americana*, 18(18), pp.1192-1198.

of serious concern, from dredging to issues related to the safety of navigation and environmental protection.

Port jurisdiction can be another problem, involving a further rift in port waste management, with port managers demanding responsibility requiring positive management.⁴³³ Such an amalgam of power of utilisation, bounty of organisations and partners, mixture of employments, and potential clash for prevalence can show complex natural issues. A coordinated methodology is required to address and survey the interrelated causes, impacts and waste administration frameworks and waste facilities.⁴³⁴

Port progress in waste management is often driven by the growth of legislation and directive, through recognition of the joint challenges posed by waste challenges.⁴³⁵ Consequently, this has impacted on societal desires, and of late, led to upsurges in the intentional arrangement that port waste management ought to be a focused factor among ports. While port waste movement has delivered an extensive variety of reactions, for the most part issue-led, an important late pattern has been a move towards shared help through joint effort.⁴³⁶

Regardless of the progress in port reception facilities and waste management, the challenges remain substantial with varying levels of demands.⁴³⁷ The establishment of port waste execution and checking projects, and key pointers, appears to be urgent to presenting the proof and understanding that it will bolster valuable port waste administration. As pressures pile up for port controllers and the system, the port authorities are expected to exhibit unambiguous proof of their affirmations alongside

⁴³³ Leggate, H., McConville, J. and Morvillo, A. eds., 2004. *International Maritime Transport: Perspectives*. Routledge, pp. 222-333.

⁴³⁴ Ibid.

⁴³⁵ Wooldridge, Chris, and Tim Stojanovic., 2004 "10 Integrated Environmental Management of Ports and Harbours." *Shipping and Ports in the Twenty-first Century*, pp. 191.

⁴³⁶ Kollikkathara, N., Feng, H. and Stern, E., 2009. A Purview of Waste Management Evolution: Special Emphasis on USA. *Waste Management*, 29(2), pp.974-985.

⁴³⁷ Paipai, E., 1999 "Guidelines for Port Environmental Management." pp.22.

the local communities with respect to waste management in order to foster a cleaner environment, in compliance with all necessary legal regulations.⁴³⁸

Similarly, ports seem to have started to recognise port specific performance indicators together with quality of environmental and waste management activity at the port.

Despite this challenge, opportunities still abound among port users for increase understanding in port waste resolutions and clean environmentally friendly practices.⁴³⁹ As ports intensify their progress on these fronts, useful lessons can be learnt from both sides of the case studies. What is so noteworthy is that the UK might has great significance for port waste management in Nigeria, there is still substantial possibility to improve the quality of the knowledge we are presently able to export.⁴⁴⁰

4.3 Port Waste Reception Facilities in UK Ports

There are in excess of 100 ports in the UK. The five biggest ones as far as capacity are Southampton, Tees and Hartlepool, London, Grimsby and Immingham, and Milford Haven, in complete dealing with in excess of 200 million tons for every year. Oil products represent a substantial piece of the aggregate volume, being half of the total exchanging volume in the UK ports.⁴⁴¹ The port business is an essential portion of the UK's economy, and the port framework is for the most part represented by port experts and organisations, for example, the Port of London Authority (PLA), British Ports Association (BPA) and Brookfield Ports Company (PD Ports).⁴⁴² A port specialist in the UK is viewed as an element which has obligation to regulate and deal

⁴³⁸ Mizzi, M., 2004. An Assessment of The Level of Understanding Regarding Issues of Marine Pollution Regulations in Respect of Waste Management (Annex V) In The Port Of Port Elizabeth. North-West University, Pp.145.

⁴³⁹ Rodrigues, Sonia Morais, Et Al., 2009 "A Review of Regulatory Decisions for Environmental Protection: Part I—Challenges in The Implementation of National Soil Policies." Environment International 35. (1), pp. 202-213.

⁴⁴⁰ Ibid.

⁴⁴¹ Butt, Nickie, 2007 "The Impact of Cruise Ship Generated Waste on Home Ports and Ports of Call: A Study Of Southampton." Marine Policy 31, (5), pp. 591-598.

⁴⁴² https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/643551/ports-goodgovernance-draft-guidance.pdf (assessed on 12 December 2017).

with every single port office and framework, and control of all exercises on the port are under national law.⁴⁴³

Nowadays, there has been an increasing demand for effective port operations from across the UK and the global community. This, would naturally suggest that UK ports will be expanded in a number of areas, including a framework to adjust to a higher interest in global exchanging and local administrations.⁴⁴⁴ In addition, larger amounts of safety enactment, and environmental guidelines are relied upon to upgrade the nature of the port framework.⁴⁴⁵ Hence, port experts must grow new systems and strategies that would guarantee the connection of the monetary, social and ecological elements of waste administration.⁴⁴⁶ Since 2002, Britain's driving ports' administrator has begun to change the structure of port waste administration.⁴⁴⁷

These adjustments in strategy are intended to accomplish the accompanying economic advancement relating to the goals of port waste reception facilities and management:

- Decrease ecological harms from port waste operations
- Realise proficiency in using port facility natural resources

Following the trends in the development of port waste, the Southampton Ports Company has attempted to respond to marine waste to enhance its natural administration framework, in line with the ISO14001 certification.⁴⁴⁸ The port framework in the UK is the second biggest in Europe with a lot of transportation; around 560 million tons for every year, of which 80% is taken care of by the best 16 ports. No UK ports that are government claimed, and thus there exist two sorts of port administration in the UK:

⁴⁴³ Alderton, P. and Saieva, G., 2013. Port management and operations. Taylor & Francis.

⁴⁴⁴ Ibid.

⁴⁴⁵ Ibid.

⁴⁴⁶ Gertsakis, J. and Lewis, H., 2003. Sustainability and The Waste Management Hierarchy. Retrieved on January 30, P.2008.

⁴⁴⁷ Carpenter, A. and Macgill, S.M., 2005. The EU Directive on Port Reception Facilities for ShipGenerated Waste and Cargo Residues: The Results of a Second Survey on The Provision and Uptake Of Facilities In North Sea Ports. Marine Pollution Bulletin, 50(12), Pp.1541-1547.

⁴⁴⁸ Smith, Leigh, and Peter Ball., 2012 "Steps Towards Sustainable Manufacturing through Modelling Material, Energy and Waste Flows." International Journal of Production Economics 140(1) pp. 227-238.

- All vast ports are claimed by the private area and incorporated into the ports that work with the Association of British Ports (ABP, for example, Southampton, Tee and Hartlepool, Felixstowe and Liverpool).
- A few ports are possessed by a trust. These ports are free from the administration and investors, for example, the Port of London.⁴⁴⁹

The port waste reception facilities and management, and safety of ports have been the mark of giving substantial attention to the future development.⁴⁵⁰ Port waste reception facilities and management challenges have turned out to be essentially more vital in feasible procedures of port organisation as the genuine danger from worldwide environmental alteration turns out to be better known. There are three components, which can make financial incentive for ports area, port authorities and way to deal with waste administration.⁴⁵¹

4.3.1 Southampton Port and its Waste Management Reception Facility Approach

Associated British Ports (ABP) are in charge of the running of the Port of Southampton and it appears as though there is waste arrangement collection, which bolsters "economic advancement for both business and environment."⁴⁵² ABP advocates for the implementation all requisite legal regulations in order to ensure the global best practices through a "strong" port waste administration. This approach spread over all ports run by ABP and is conveyed via their Environmental Legal regulations on Waste Management Strategy, which is in conformity with the MARPOL 73/78, EU 2000/59 (Port waste Directive) and other applicable legislations.⁴⁵³

⁴⁴⁹ Associated British Ports; Associated British Ports Environmental Statement. Available from: (<http://environment.abports.ac.uk/policy.htm>).

⁴⁵⁰ Asgari, N., Hassani, A., Jones, D. and Nguye, H.H., 2015. Sustainability Ranking of The UK Major Ports: Methodology and Case Study. *Transportation Research Part E: Logistics and Transportation Review*, 78, pp.19-39.

⁴⁵¹ Ibid.

⁴⁵² Ball, Iwan, 1999 "Port Waste Reception Facilities in UK Ports Iwan Ball." *Marine Policy* 23, (4), Pp. 307-327.

⁴⁵³ Associated British Ports; Associated British Ports Environmental Statement. Available from: (<http://environment.abports.ac.uk/policy.htm>). (Assessed on 24 May 2016).

There is a compulsory waste expense for most ships landing at Southampton port, which pays for the transfer of up to 4m³ of general waste that under under MARPOL 73/78 Annex V. Any sum more noteworthy than this, or waste within the MARPOL 73/78 Annexes, must be managed by outside waste temporary workers, organised by operators of the ship.⁴⁵⁴ Thus, Article 4(2) validates the fact that port must provide the reception facilities suitable for accepting all sorts and amounts of ship wastes, and also consider the needs of the port ship waste users.⁴⁵⁵ ABP addresses the challenges of port waste by providing a list of independent waste contractors that is being used by the port for ships operators to apply for waste disposal at the port.⁴⁵⁶ Onyx Marine is the chief contractual worker for transfer of ship waste at the port and has contractual agreement with the relevant shipping companies.⁴⁵⁷

Onyx Marine is located on the opposite bank of the port, where its main function is the collection of waste. Evidence shows that it was the first company in the UK to achieve ISO 9002 accreditation, and by implication, has a high degree of reputation in both management classifications, quality assurance and administration.⁴⁵⁸ Onyx Marine undertaking reusing and re-utilise waste, in consistence with the finest environmental process. The firm performs a remarkable job in waste disposal for ship as well as for most ship coming into the Port. Adequate waste transfer is fundamental not just to Onyx Marine, City Council of Southampton and ABP but also for the community and port surroundings environment.⁴⁵⁹

All ships requiring the administration of Onyx Marine must finish a 48-hour notice structure preceding entry to enable the company to prepare for it waste delivery at the

⁴⁵⁴ Ibid.

⁴⁵⁵ EU Directive 2000/59, Article 4(2).

⁴⁵⁶ Ibid.

⁴⁵⁷ Butt, Nickie.,2007 "The Impact of Cruise Ship Generated Waste on Home Ports and Ports of Call: A Study of Southampton." *Marine Policy* 31, (5), pp. 591-598.

⁴⁵⁸ Ibid.

⁴⁵⁹ Mavrotas, G., Gakis, N., Skoulaxinou, S., Katsouros, V. and Georgopoulou, E., 2015. Municipal Solid Waste Management and Energy Production: Consideration of External Cost Through Multi-Objective Optimization and Its Effect on Waste-To-Energy Solutions. *Renewable and Sustainable Energy Reviews*, 51, pp.1205-1222.

port. the directive helps the entire procedure and guarantees that the organisation agrees to the accompanying administrative drivers.⁴⁶⁰

- List of Waste Regulations 2005
- Hazardous Waste Regulations 2005
- Carriage of Dangerous Goods Regulations (Classification, Labelling and Packaging) 1996, Merchant Shipping & Fishing (Port Waste Reception Facilities) Regulations 2003

Types and volumes of waste gathered by Onyx Marine in 2009 are recorded under MARPOL Annexes. Five commercial ships represented an expansive amount of waste over the MARPOL streams, and most important of all is the number of trash and solid waste.⁴⁶¹ Around 5,490 ship called at Southampton in 2009, of which commercial ships were in charge of all the 62.5% solid waste collected by Onyx Marine.⁴⁶² Statistics determined for ship coming to the port amid August 2005 show roughly 5,150 tons of wastes produced by travellers on board, around 75% of which would have been discarded adrift (burned), demonstrating just 1,300 tons of waste required transfer in Southampton.⁴⁶³

4.3.2 United Kingdom Port Reception Facilities and Charging Policy

Port waste management and reception facilities in Southampton Port might not be as straightforward as it appears, in terms of establishing an agency managing waste at the port. Worthy of note is that the arrangement of waste management is costly, and there has been much discussion in the UK, and somewhere else, with regards to the charges and who will pay the charges that charges are imposed for this service.⁴⁶⁴ The major issue is that the challenge of port waste management underlies a significant number of the contentions over what forms part of the incentives or disincentives

⁴⁶⁰ Ibid.

⁴⁶¹ Chen, Chung-Ling., 2015 "Regulation and Management of Marine Litter." In *Marine Anthropogenic Litter*, Pp. 395-428. Springer International Publishing, pp.44.

⁴⁶² Subramanian, N. and Gunasekaran, A., 2015. Cleaner Supply-Chain Management Practices for Twenty-First-Century Organizational Competitiveness: Practice-Performance Framework and Research Propositions. *International Journal of Production Economics*, 164, pp.216-233.

⁴⁶³ Ibid.

⁴⁶⁴ Georgakellos, D.A., 2007. The Use of The Deposit–Refund Framework in Port Reception Facilities Charging Systems. *Marine Pollution Bulletin*, 54(5), pp.508-520.

relating to the use of such facilities. Despite the shortcomings in port affiliations, it appears that the expense of agencies establishes a disincentive for some port users. Notwithstanding, for bigger ship, expenses might be optional to different disincentives. An example can be seen from the time that is taken to utilise the facilities and the apparent hazard of authorisation activity.⁴⁶⁵ The charges for waste reception facilities can be collected using various methods.

The port authorities, often have limited proficiency in waste collection situations and waste administration is best contracted out to proficient waste carriers,⁴⁶⁶ hence limiting the role of port authorities from having responsibility in waste collection, and guarantee that authorised waste transfer contractual workers give support for transportation and collection of waste at the port.⁴⁶⁷ The ship's operator would then be able to arrange the waste by means of any of the affirmed contractual workers. One of the fundamental advantages of this methodology is that shipping agents are responsible for all parts of waste transfer. The expenses to be charged may be prone to changes from company handling port waste collection and port's location, depending upon the quantity and type of the waste and the separation it needs to make a trip to an official disposal site. Port waste collection contractors competition ought to guarantee that there is no inordinate benefit, even though research has suggested that the best service can often be achieved, provided a great percentage of the business is channelled through a particular contractor instead of variety of them.⁴⁶⁸ In view of the above, most UK ports agreed with principle of a regime based on charge for the service rendered, with the user (in most cases the ship's agent) in a direct contact with the waste contractor. The second way to deal with financing waste reception facilities is expecting ship to pay an immediate charge waste they need to dispose of.⁴⁶⁹

⁴⁶⁵ De Langen, P.W. and Nijdam, M.N., 2007. Charging Systems for Waste Reception Facilities and the Level Playing field: A case from North-West Europe. *Coastal Management*, 36(1), pp.109-124.

⁴⁶⁶ Ibid.

⁴⁶⁷ Curtis, Jeff B.1984 "Vessel-Source Oil Pollution and MARPOL 73/78: An International Success story." *Envtl. L.* (15), pp. 679.

⁴⁶⁸ Curtis, Jeff B.1984 "Vessel-Source Oil Pollution and MARPOL 73/78: An International Success story." *Envtl. L.* (15), pp. 679.

⁴⁶⁹ Ibid.

The approach may rely on financial rule that the facility users should meet the expense. There might be an explicit fee or it might be incorporated into port fee when, for instance, a port settles on business lands (and not through a legitimate commitment) to provide a general user skip for rubbish, which is available for free at the point of use.⁴⁷⁰ The need in most ports for ship to pay for the utilisation of discretionary waste reception facilities were scrutinised in the Lord Donaldson's Report into the Prevention of Pollution from Merchant Shipping, which suggested that waste reception facilities ought make available for free at the point of utilisation, with their general expenses incorporated inside comprehensive port levy.⁴⁷¹ Through this process, ship-owners are not expected to incur any form of additional or direct fees before using port waste reception facilities, as fees are collected via an indirect methods which cannot be avoided. It can, therefore, argue such strategy together with the direct fee method, align with the ' Principle of Polluter Pays ' (PPP). This suggests that since someone is paying, he/she might as well make use of the facilities, therefore eliminating the practice of illegally discharging waste at sea. This position is of course relied on the need that the service rendered at the port does not cause unnecessary delay for the ship.⁴⁷² Besides, on the grounds that such fee is being paid by most of the ships coming into the port, the fee can be relatively minor.⁴⁷³

Closely to pay base on the quantity of waste is the 'fixed fee method' which may be viewed as a subordinate of the comprehensive port fee charging component. The transfer costs in this occurrence are imposed as a different extra charge, yet at the same time must be paid together with the port levy.⁴⁷⁴ Similarly, the settled expense framework does not specifically charge for the disposed waste. It might be contended that neither one of the approaches give an incentive to waste reduction prepares

⁴⁷⁰ Brooks, M.R. and Cullinane, K. eds., 2006. Devolution, Port Governance and Port Performance (Vol. 17). Elsevier.

⁴⁷¹ Brooks, M.R. and Cullinane, K. eds., 2006. Devolution, Port Governance and Port Performance (Vol. 17). Elsevier.

⁴⁷² Plant, G., 1994. Safer ships and cleaner seas: A Review Article on the Report of Lord Donaldson's Inquiry into the Prevention of Pollution from Merchant Shipping. *Int'l J. Marine & Coastal L.*, 9, p.535.

⁴⁷³ Ibid.

⁴⁷⁴ Leape, Jonathan, 2006 "The London Congestion Charge." *The Journal of Economic Perspectives*, pp. 157-176.

onboard vessels, not at all like the immediate expense technique which ought to in principle, influence waste- keeping.⁴⁷⁵

Charging as a major aspect of port contribution, regardless of if the facilities are utilised or not, it is commonly restricted by the UK ports and surely by the European Sea Ports Organization (ESPO), which speaks for the ports in 16 European Countries, in view of a few contentions.⁴⁷⁶ Initially, levy for the utilisation of discretionary waste reception facilities in a few ports and not in others may screw the regularly savage rivalry that exists between ports in every area. In any case, it is yet to be proven wrong whether differences in charging procedures have critical effect upon rivalry between ports, since there are other related elements that ought to be viewed as which might be of equivalent or more noteworthy significance to business delivery, for example, the accommodation and openness of the waste reception facilities.⁴⁷⁷ Besides, exceptions would be proclaimed for particular sorts of ship. For instance, ships often make moderately rare port calls would not hope to make indistinguishable payments from ships or vessels for short-ocean shipping which make visit port calls.⁵²⁰

In view of this argument the scenario presented is of undesirable risk of waste from ships carrying consignments to the port offering the inexpensive or most suitable waste reception facilities. The challenge could be tackled by presenting such charges for ships disposing extreme quantities of waste. Be that as it may, the implementation of such procedure might offer rise to expansive expenses from the organisation it would unavoidably make.⁴⁷⁸ The ports business has opposed that the free at the purpose of utilisation routine would not really prompt essentially more elevated amounts of utilisation. This contention depends on a test conducted on free waste reception facilities directed by the German government at the ports of Hamburg and Bremen around June 1988 and May 1991.⁴⁷⁹

⁴⁷⁵ Ibid.

⁴⁷⁶ <http://uk-ports.org/european-sea-ports-organisation/and>
https://ec.europa.eu/transport/sites/transport/files/modes/maritime/studies/doc/2006_06_eu_seaports_study.pdf (Assessed on 4 March 2018).

⁴⁷⁷ McLeod, Fraser, and Tom Cherrett., 2011. Waste collection." Waste A Handbook for Management. Elsevier Inc., Burlington, pp. 61-76.

⁴⁷⁸ De Langen, P.W. and Nijdam, M.N., 2007. Charging Systems for Waste Reception Facilities in Ports and the Level Playing field: A Case from North-West Europe. Coastal Management, 36(1), pp.109-124.

⁴⁷⁹ Ibid.

Amid this period around 3.95 million Deutschmarks were put resources into enhancements of waste reception and disposal facilities. Subsequently, huge increments were seen in the measures of waste released. In any case, this may not be straightforwardly owing to the removal of the monetary disincentive.⁴⁸⁰ Rather it might be identified with the upgrades recorded in the reception and disposal facilities which were made accessible over the span of the trial, joined with extra data and made available to port users. Shockingly, the plan was in the long run deserted when the Government pulled back its funding.⁴⁸¹

The UK Government, along with some other States within European, has indicated interest in working on the way to a dependable regime for providing fund for waste reception facilities to eradicate or reduce some of the challenges associated with waste management at the port of member states.⁴⁸² Therefore, the European Directive on port reception facilities for ship-generated waste and cargo residues suggest that the prices of technology and operation of port reception facilities would be generated via the collection of a fee, payable by all ships coming into the port of a member state.⁴⁸³ The fees may be distinguished with regards to, *inter alia*, the type and ship size, and might be merged into the port levies or may be a direct fee arrangement with the provider of the reception facilities.⁴⁸⁴

Moreover, extra fees might be forced with regard to amounts and quantities of waste discharge by the ship. It is likewise fascinating to take note that a decrease in the charge might be conceded if the ship's waste administration, structure to such an extent that the ship can demonstrate that it generates little amounts of ship-generated waste. However, the directive allows the option of difference between fee schemes among community or member states ports might initiate various effects upon

⁴⁸⁰ Lentz, S.A. and Felleman, F., 2003, April. Oil Spill Prevention: A Proactive Approach. In International Oil Spill Conference (Vol. 2003, No. 1). pp. 3-27.

⁴⁸¹ Ibid.

⁴⁸² Lentz, S.A. and Felleman, F., 2003, April. Oil Spill Prevention: A Proactive Approach. In International Oil Spill Conference (Vol. 2003, No. 1). pp. 3-33.

⁴⁸³ Reinhard, A.J., de Blaeij, A.T., Bogaardt, M.J., Gaaff, A., Leopold, M.F., Scholl, M.M., Slijkerman, D.M.E., Strietman, W.J. and van der Wielen, P., 2012. *Cost-Effectiveness and Cost-Benefit Analysis for The MSFD*. LEI, Part of Wageningen UR.

⁴⁸⁴ Ibid.

competition, and so it gives opportunity to member states to take suitable steps to eliminating such effects.⁴⁸⁵

Port waste administration planning involves an adaptable way to deal with fee for waste reception facilities by enabling ports to settle on the most suitable technique, assessing conditions of each port.⁴⁸⁶ Ports are qualified by legislation to levy contribution to pay for the release of their legal facilities; along these lines, it isn't unprecedented to incorporate the expense of giving waste reception facilities inside general port levy. In reality, numerous little ports officially offer free waste facilities since it isn't practicality to cost-effective to collect a levy. In any case, it is misdirecting to propose that the comprehensive charge framework is appropriate to a wide range of waste.⁵³⁰ For instance, facilities for toxic fluid synthetic compounds might be more suitable for a direct charging instrument since they will in general be more particular and subsequently expensive than facilities for waste, for example, trash.

There seems, by all accounts, to be a difficult situation to ask all waste reception services in all ports to be free at the purpose of utilisation. Notwithstanding the methodology that is pushed, there are solid purposes behind supporting the view that the choice ought to be reserved for the ports to decide, however the review about how to guarantee that ships know about the facilities and utilise them.⁴⁸⁷ The significance of having satisfactory port waste reception facilities can't be over-stressed, as it is plainly fundamental if reducing or eradicating waste in seaports is to be achieved.

The legal direction on port waste administration structure is the MARPOL Convention, which has been broadly received by maritime states.⁴⁸⁸ This Convention expects port to give waste reception facilities sufficient consideration and which don't make undue delay to ship utilising them.⁴⁸⁹ All waste reception facilities, paying little mind to estimate, ought to have the capacity to get MARPOL 73/78 Annex V wastes (refuse)

⁴⁸⁵ Greenland, F., 2018. Free ports and steel containers: The corpora delicti of artefact trafficking. *History and Anthropology*, 29(1), pp.15-20.

⁴⁸⁶ McDougall, F.R., White, P.R., Franke, M. and Hindle, P., 2008. *Integrated Solid Waste Management: A Life Cycle Inventory*. John Wiley & Sons.

⁴⁸⁷ Carpenter, Angela, And Sally Macgill., 2001. Charging for Port Reception Facilities in North Sea Ports: Putting Theory into Practice. *Marine Pollution Bulletin* 42, (4), pp. 257-266.

⁴⁸⁸ Ibid.

⁴⁸⁹ Carpenter, Angela, And Sally Macgill:, supra note 515, pp. 257-288.

and Annex I, and in addition being fit for taking care of some additional wastes in the amounts that would ordinarily be taken care of or released inside port.⁴⁹⁰ In the UK's view, adequacy ought not be acknowledged essentially on the grounds that there is extra limit in the waste reception facilities, due to lack of absence of complaint from port users with respect to individual facilities.⁴⁹¹ Satisfactory facilities are the ones which have been meticulously projected ahead of the needs and meet the standard prerequisites of the ship utilising the port. It is the duty and responsibility of the port authorities to attempt and remove any hindrances to easy usage of such waste reception facilities that cater for all categories of waste which are discharged at the port. However, the above suggestion might appear not too all-inclusive in classification, and other issues emphasised in this research might contribute to the provision of adequate facilities. These include the availability of the suitable data to port users about the usage of the facilities.⁵³⁶

Moreover, port waste reception facilities ought to advance waste minimisation activities by encouraging waste re-utilise or recycling schemes.⁴⁹² Conceding to ordinary meaning of the expression "satisfactory", it is imperative because no important criteria for the recognisable proof of deficiencies can be produced without first choosing this issue. Following a broad careful work out, the UK inferred that there was no straightforward plan that would ascertain quality arrangement and utilisation of port waste reception facilities.⁴⁹³ Waste in seaports emerges from a wide range of port activities, not just business shipping.⁴⁹⁴

Apparently, the most noteworthy of these measures is the necessity for all ports all through the UK, including marinas and harbours, to have port waste administration

⁴⁹⁰ Ibid.

⁴⁹¹ Øhlenschlæger, J.P., Newman, S. and Farmer, A., 2013. Reducing Ship Generated Marine Litter—Recommendations to Improve the EU Port Reception Facilities Directive. Report Produced for Seas at Risk. United Kingdom: Institute for European Environmental Policy. ⁵³⁶ Ibid.

⁴⁹² Chua, T.E., Bonga, D. and Bermas-Atrigenio, N., 2006. Dynamics of Integrated Coastal Management: PEMSEA's Experience. *Coastal Management*, 34(3), pp.303-322.

⁴⁹³ Dinwoodie, J., Tuck, S., Knowles, H., Benhin, J. and Sansom, M., 2012. Sustainable Development of Maritime Operations in Ports. *Business Strategy and The Environment*, 21(2), Pp.111-126.

⁴⁹⁴ Ibid.

plans.⁴⁹⁵ In 1996, numerous ports, and harbour authorities started presenting port waste administration designs as best practice. Be that as it may, waste onboard planning has turned out to be required for all ports since 1998. Port waste administration planning depends on the idea that port authorities must give adequate consideration when building waste reception facilities for ships frequently utilising the port.⁴⁹⁶ In view of this, port users of the waste reception would be able to plan to give port authorities adequate time to plan ahead of waste delivery which will support the transfer of waste from ship to shore.⁴⁹⁷

Notwithstanding the physical differences in the ports size or varieties in the size and category of ship cater for, waste management at the port means to guarantee that the port authorities have a comparable way to tackle waste management reception facilities.⁴⁹⁸ As opposed to trying to force basic arrangements on all ports, port waste management plan means to set up the perspectives which port authorities ought to pursue when choosing what waste reception facilities ought to be provided⁴⁹⁹

Clearly, the efficiency of port waste management development will not be restricted due to biases as to its purpose. In this way, it indicates that preparation in a broader by testing the impact of various options to arrive at most reliable choices, ascertaining the most suitable, and mapping out plans necessary to secure this aim.⁵⁰⁰ Thus, it seems obvious that port waste management preparation (like all kinds of preparation) includes more than just production of a system, the system should not be driven exclusively by the necessity to documentation publication. The strategy itself should form the foundation of a tangible outputs method that allows the underlying foundation

⁴⁹⁵ Di Vaio, A. and Varriale, L., 2018. Management Innovation for Environmental Sustainability in Seaports: Managerial Accounting Instruments and Training for Competitive Green Ports beyond the Regulations. *Sustainability*, 10(3), p.783.

⁴⁹⁶ Ibid.

⁴⁹⁷ Carpenter, A., Lozano, R., Sammalisto, K. and Astner, L., 2018. Securing a port's future through Circular Economy: Experiences from the Port of Gävle in contributing to sustainability. *Marine pollution bulletin*, 128, pp.539-547.

⁴⁹⁸ Kuznetsov, A., 2014. Port sustainability management system for smaller ports in Cornwall and Devon.

⁴⁹⁹ Ibid.

⁵⁰⁰ Adams, M., Quinonez, P., Pallis, A. and Wakeman, T., 2009. Environmental Issues in Port Competitiveness. Dalhousie University, Canada.

for quality waste management at the port, grounded on the background of quality practice and general perspective that ports can tailor to their individual needs.⁵⁰¹

Port waste management process has gone beyond the level of making it a choice for UK ports. It is an integral aspect of waste management and designs a significant strategy in the manner at which harbour and port authorities must tackle the availability waste reception facilities. This research has also evaluate other methods to enhancing the usage of reception facilities with the objective of removing waste at the seaports, specifically enforced disposal of ship-generated waste and the benefits and disincentives of various financing mechanisms.⁵⁰² Nevertheless, available evidence suggests that free usage of waste reception facilities or disparities in charges that might lead to decrease in the quantity of waste being discharged at the seaport.⁵⁰³ Perhaps, what might be required is enhanced greater awareness and education among the port users on the effect of their actions against the marine environment. Port waste legal regulations only becomes effective if they are appropriately implemented. In this regard, prosecution of waste offender might only a part of the answer.⁵⁰⁴

The message must get to the couple of unreliable seafarers who disregard their duties, perhaps through indifference, recklessness, or trying to set aside some cash which is morally disallowed to dump waste at seaports. Port waste administration process allows a noteworthy commitment to this exertion, by encouraging discussion among port waste reception facilities users, and the waste transfer agency, along these lines guaranteeing that the waste reception facilities are accessible at the ports, and the strategies for their utilisation, are conveyed to the consideration of possible port users.⁵⁰⁵

⁵⁰¹ Ibid.

⁵⁰² Paixao, A.C. and Bernard Marlow, P., 2003. Fourth Generation Ports a Question of Agility. *International Journal of Physical Distribution & Logistics Management*, 33(4), pp.355-376.

⁵⁰³ Ibid.

⁵⁰⁴ Carpenter, A. and Macgill, S., 2001. Charging for Port Reception Facilities in North Sea Ports: Putting Theory into Practice. *Marine Pollution Bulletin*, 42(4), pp.257-266.

⁵⁰⁵ Ibid.

4.4 Nigerian Port Waste Management and its Reception Facilities

The fast growth of unplanned and uncontrolled port waste, in most African countries have led to environmental degradation in the recent times to an obvious point, where it can no longer be tolerated.⁵⁰⁶ Undoubtedly, one of the most demanding concerns of this uncontrolled waste at the port, especially in Nigeria, has been the challenge of improper management of toxic waste, liquid and solid at the Nigerian ports.⁵⁰⁷ Recent events have indicated that Apapa port in Lagos challenge in waste reception facilities management has become monstrous that has cancelled the most significant efforts deployed by the Nigerian Ports Authority (NPA) to combat the menace of port waste.⁵⁰⁸ Further research expose parts of the waste reception facilities management challenge, for example, most of the seaport often littered with waste, unmanaged garbage, waterways jammed with unwanted items, and waste disposal facilities constituting hazard to peoples around the port.⁵⁰⁹ It seems clear that the problems generated by the ineffective port waste reception facilities management at the Apapa port threaten the smooth or proper administration at the port, and often cause delays to ships in the port. The diverse and complex problems facing ports in Nigeria, especially with regard to waste management and grossly inadequate waste reception facilities, call into question the capacity for governance in the Lagos port.⁵¹⁰

Nigeria has the potential to be one of the largest economies and markets among the nations in West Africa sub region. Nevertheless, in the recent years, its cargo business has continued to depreciate in the market share value in Africa. The mixture of ineffective port waste management reception facilities and cargo insecurity has led to

506 ONYEMA, Henry Kelechi, OBINNA, Polycarp, EMENYONU, Uchenna Martin, EMEGHARA Godfrey Chigozie., 2015. The Impact of Port Congestion on The Nigerian Economy International Journal of Scientific Research and Management (IJSRM) Volume 3 Issue 7 Pages 3431-3437 Website: www.ijsrm.in ISSN (e): 2321-3418

507 Orji, O. Goodhope, 2014. The Role of Effective Ports Management in Facilitating International Trade in Nigeria. European Journal of Business and Management 6, (13), pp. 204-215.

508 Ajibola, V.O., Unuaworho, A.E. and Funtua, I.I., 2005. Pollution Studies of Some Water Bodies in Lagos, Nigeria. Caspian Journal of Environmental Sciences, 3(1), Pp.49-54.

509 Iwugo, K.O., D'Arcy, B. And Andoh, R., 2003, August. Aspects of Land-Based Pollution of An African Coastal Megacity of Lagos. In Diffuse Pollution Conference, Dublin (Vol. 14, Pp. 122-124).

510 Ibid.

situation whereby Nigerian ports appear unappealing to shippers.⁵¹¹ In Nigerian, most port operators faced with two choices due to this situation. In fact, most Nigerian port users have decided to turn their attention to Cotonou in the Republic of Benin into their New Jersey with a view to continuing their shipping business due to the unprotected environmental waste condition at the Apapa port. At the moment, few of the Nigerian port operators maintain their head offices in neighbouring country Cotonou in order to have access to efficient port waste management facilities. Consequently, other company that remained generally wound up, which has led to a high level of industry mortality. Thus, the significance of effective port waste management in facilitating economic development cannot be over-emphasised.⁵¹²

The Nigerian maritime industry is characterised by government policy inconsistencies and other major problems that have led to operational delays.⁵¹³ Thus, it is resulting in inefficiency, dwindling productivity and a negative scenario in the maritime industry, as affected by waste management.⁵¹⁴ Nevertheless, the Nigerian maritime industry has observed some operative progresses that uphold the requirements of the International Maritime Organization (IMO).⁵¹⁵ In 2008, Ndikom observed that “the industry is one that operates with clear rules and procedures in conformity with international standards”.⁵¹⁶ The industry has observed challenges involving operational inconsistencies of policy and inefficiency in port waste management.

Igbokwe (2013) is of the opinion that Apapa port has witnessed little improvement in the efficiency and productivity of waste management reception facility in meeting the International Maritime Organisation (IMO) stipulation of avoiding unnecessary delay

⁵¹¹ Nwanosike, F., 2014. Evaluation of Nigerian Ports Post-Concession Performance (Doctoral Dissertation, University of Huddersfield).

⁵¹² Ibid.

⁵¹³ Obed, B. and Emeghara, G.C., 2012. A Critical Appraisal of Port Reform and Development Policy in Nigeria. *Research in Business and Management*, 1(1), pp.13-22.

⁵¹⁴ Osaretin, P.A., 2007. Efficient Port Operations and The Benefits of Actors-A Case Study of Tin Can Island Port, Nigeria. Rapport Nr.: Master Thesis 2006: 75.

⁵¹⁵ Correlate of Port Productivity Components in Tin Can Island Port, Apapa, Lagos http://www.academia.edu/18374302/Correlate_Of_Port_Productivity_Components_In_Tin_Can_Island_Port_Apapa_Lagos (Assessed on 24 June, 2017).

⁵¹⁶ Ndikom, O., 2008. *Maritime Transport: Management and Administration in Nigeria*. Bunmico Publishers.

to ships in discharging waste at the port.⁵¹⁷ The situation in Nigerian ports is that the equipment and plant for handling waste are either old, obsolete, malfunctioning, broken down or insufficient, thus slowing down the discharge of waste within the port. Consequently, this might have resulted to reduction in port efficiency, lengthier time turnaround for ship, incompetence, cargo damage, Apapa port charge high rate, and demurrage payments.⁵¹⁸ Efficient port waste reception facilities enhance port operations, which include the schedule of ship arrivals; and ship operations, for example, cargo unloading and loading are also enhanced via the availability and easy access of port waste management facilities.⁵¹⁹

The volume of waste generation at the Apapa port has amplified at a very rapid rate in the recent years with the absence of effective and contemporary technology-equipment for port waste management.⁵²⁰ The accumulation of waste at the port, and removal of such wastes are product if well thought out, and appropriately organised might yield the anticipated solutions to port waste management challenges in Nigerian.⁵²¹ The reduction in the volume of waste generation in most ports in Nigeria, issues inducing the generation, categories of waste, and port waste collection, disposal, reusing, and port environmental challenges can be reorganise for effective waste management.⁵²²

The enforcement of the International Convention for the Prevention of Marine Pollution from Ships (MARPOL) was further enhanced in Nigeria around 2014. During this period, a technology was commissioned to address the challenges of reception and management of waste from ship.⁵²³ The technology is in full operation and now processing waste received from ships coming into the Lagos ports in accordance with

⁵¹⁷ Igbokwe, M. <http://www.mikeigbokwe.com/new1/Importance%20of%20Maritime%20Transport%20in%20economy%20&%20Port%20System.pdf> (Assessed on 17 June 2016).

⁵¹⁸ Aluko, Ola E., 2012. Environmental Degradation and the Lingering Threat of Refuse and Pollution in Lagos State. *Journal of Management and Sustainability* 2, (1), pp. 217.

⁵¹⁹ Notteboom*, T.E. and Rodrigue, J.P., 2005. Port Regionalization: Towards a New Phase in Port Development. *Maritime Policy & Management*, 32(3), pp.297-313.

⁵²⁰ Ibid.

⁵²¹ Ndikom, O.B., 2013. An Appraisal of The Operational Limitations of The Private Terminal Concessionaires in Landlord Port Model. *Continental Journal of Social Sciences*, 6(1), p.9.

⁵²² Ibid.

⁵²³ Nigerian Ports Authority: <http://www.iaphworldports.org/LinkClick.aspx?fileticket=eMCUk3lbGVI%3D&tabid=4943>.

the international legislation in operation in Nigeria. The technology was commissioned by the Nigerian Ports Authority (NPA), was built on Snake Island by African Circle Pollution Nigeria, to be operated under a 25-year, operate and transfer (BOT) arrangement.⁵²⁴ The technology comprised of three major sub-machine that are linked only by electricity supply and water. There is a sub-machine for the reception of hazardous materials from ships and it is developed with plastic crushing machines and drums. The other sub-machine is sorting machines and incinerators to burn rubbish collected from the ship coming into the Lagos port day-to-day, though the main technology was built to separate and treat water and oily waste collected from ships.⁵⁷⁰

In accordance with the above development, guidelines have been released by Nigerian government on ship waste management in accordance with MARPOL 73/78, which made it compulsory for nations to provide waste facilities for ships coming into its ports.⁵²⁵ Hence, Nigerian is signatory to the guidelines on MARPOL 73/78 and is expected to make available waste reception facilities for all manner of ship-generated waste within its port, and shore-based activities. It provides that, authorities administrating waste, whether at state, national, government at local level or territorial has the duty to ensure that port waste reception facilities operate in an environmentally sound manner.⁵²⁶

The guidelines characterised waste collection from ships based on their types, and classification property for easy disposal of the materials. It also suggested that ship-generated waste could be any of the following: paper, medical plastic waste, hazardous substance, metal, glass, general rubbish and many more; or liquid, that is classified as oil waste, mixture of oily waste, water from wash tank and noxious liquid.⁵²⁷ The guidelines state that, the only method that can be used to enhance waste

⁵²⁴ Nigerian Ports Authority: <http://www.nannewsnigeria.com/npa-inaugurates-waste-managementtrucks-tin-can-port>. http://www.ecoprofiles.org/ad_details.php?co=640. (Assessed on 13 March 2016). ⁵⁷⁰Vanguard News Paper <http://www.vanguardngr.com/2012/08/african-circle-receives-12-specialisedtrucks-to-curb-pollution/> (Assessed on 13 March 2016).

⁵²⁵ Ibid.

⁵²⁶ Vanguard News Paper <http://www.vanguardngr.com/2012/08/african-circle-receives-12-specialisedtrucks-to-curb-pollution/> (Assessed on 13 March 2016).

⁵²⁷ Business Day News Paper <http://businessdayonline.com/2015/01/african-circle-boosts-pollutioncontrol-capacity-with-acquisition-of-six-special-trucks/> (accessed 13 March 2016).

management is through the provision of adequate waste management facilities, reusing, disposal and treatment of waste. It also states that waste decrease, separation and recycle were suitable approaches for water management. In addition, waste management method is vital in general management of ship-generated waste at the ports.⁵²⁸

The guidelines further suggested some variations of options for waste disposal, it depends on the category of waste in most cases. It also recommend that disposal of waste could be controlled by appropriate authorities and it anticipates that such waste disposal should be carried out with the adequate information that it is being done in an accepted way in accordance with environmental standards.⁵²⁹ Consequently, African Circle Pollution Management acquired two Maritime Pollution Vessels with a view to complying with the condition of the 25-year contract with the Nigeria government on collection of waste at the port from ship and provision waste management to the port. The current procurement of ship specialised in waste collection, from other ships at the Apapa port has brought to four, the total number procured by the company so far. The ship is expected to be used for waste collection ship coming into the Apapa port from where it would be pumped into the tanks by the machine.⁵³⁰

The aim of this company is to ensure that waste within the nation's ports is handled with care. Interestingly, Nigeria is not deficient in legislation that covers and protects its ports environment against ship-generated waste.⁵³¹ The question of how the nation coped with the news of detection of harmful waste dumped at Koko in the then Bendel State, Nigeria in 1988, led to the promulgation of Environmental Act 1989.⁵³² However,

⁵²⁸ Ibid.

⁵²⁹ African Circle Pollution Management:
<http://www.dailytrust.com.ng/sunday/index.php/business/676sea-pollution-african-cycle-imports-2-ships>. (Assessed on 25 June 2017)

⁵³⁰ Ibid.

⁵³¹ African Circle Pollution Management supra note 560.

⁵³² Ogbodo, S.G., 2009. Environmental Protection in Nigeria: Two Decades after the Koko incident. *Ann. Surv. Int'l & Comp. L.*, 15, p.1. See also, Ayobayo Babade; The Koko Incident: The Law of the sea and Environmental Protection http://www.academia.edu/10588424/The_Koko_Incident_The_Law_of_the_sea_and_Environmental_Protection (Assessed on 25 June 2017)

the problem of implementation of environmental legislation still continues, and this appears to be due to a lack of political direction from the government side and the failure of government to educate the public on the extant waste management legislation and adequately enforce them.⁵³³

Analogous to the above, is the much talked about “Nigeria factor”, corruption, whereby waste is dumped, particularly by those people in the corporate sector, with intentionally breach of waste legislation.⁵³⁴ Lack of alertness to environmental challenges in Nigeria is also one of the difficulties facing the effective control of port waste management. Inexperience creates serious obstacles to the control and implementation of waste legislation and the solutions available at law. There should be an awareness on the negative consequences on the acts of omissions from those empowered to implement waste legislation.⁵³⁵

The lack of adequate enforcement of the extant laws on waste management in Nigeria is also a contributing issue. Also, the challenge of jurisdiction to try most matters under the Harmful Waste Special Criminal Provisions Act is bestowed on the Federal High Court.⁵³⁶ However, from the findings generated about the Court, it appears the capacity has been overloaded with other cases and adding environmental waste pollution matter to the list of matter that can be handled by the Court would stretch it to breaking point, which can often result to Court congestion and delay in trials of pollution and other cases.⁵³⁷

⁵³³ Ibid.

⁵³⁴ Aderoju, O.M., Dias, A.G. and Guimarães, R., 2015, September. Building an Integrated Perception and Attitude Towards Municipal Solid Waste Management in Nigeria. In *WASTES 2015–Solutions, Treatments and Opportunities: Selected papers from the 3rd Edition of the International Conference on Wastes: Solutions, Treatments and Opportunities*, Viana Do Castelo, Portugal, 14-16 September 2015 CRC Press. P.7.

⁵³⁵ Okon, E.E., 2003. The Environmental Perspective in the 1999 Nigerian Constitution. *Environmental Law Review*, 5(4), pp.256-278.

⁵³⁶ Nwufo, C., 2010. Legal Framework for the Regulation of Waste in Nigeria. *African Research Review*, 4(2).

⁵³⁷ Ebeku, K.S., 2007. Constitutional right to a healthy environment and human rights approaches to environmental protection in Nigeria: Gbemre v. Shell revisited. *Review of European, Comparative & International Environmental Law*, 16(3). Also see; the judicial approach to environmental protection in Nigeria pp.312-320.

In view of the above, the research further noted the following points; that most of the challenges of port waste environmental protection particularly that of guideline and waste management, could be adequately implemented if the following measures could be approved by the Nigeria.⁵³⁸ First, Nigeria government can guarantee that the environmental statements contained in its developmental agendas are put into effective implementation by ensuring adequate environmental impact assessment in all its port,⁵⁸⁵ with a view to achieving the much-needed sustainable growth at the end of the day. Secondly, the obvious insufficiencies of most of the country's environmental laws vis-à-vis port waste management needs urgent modification to allow the law more effective by way of providing adequate waste reception facilities, and by imposition of higher payment on reasonable damages that would serve as a preventive measure to would-be waste polluter offenders.⁵³⁹

Ever since the international legal conventions that acknowledged the 'polluter pays' principle, the government can introduce environmental taxation on industries operating in Nigeria with a view to making additional funds accessible for waste management, at the port.⁵⁴⁰ Finally, the exclusive authorities bestowed on the Federal High Court for environmental pollution matters should be extended to, the State High Courts to try environmental waste law offender, or alternatively creates special Court from the existing court with exclusive jurisdiction to try all port waste pollution cases.⁵⁴¹

The present study has also research on the Nigerian Ports Authority reliance on port waste management companies handling waste in ports. Perhaps the NPA could build more port waste reception facilities to reduce the existing ports and make them more effective. Lastly, in view of the important responsibility placed on ports due to international trade and economic advancement of countries, investors in the port

⁵³⁸ van Dyck, G.K., 2015. Assessment of Port Efficiency in West Africa Using Data Envelopment Analysis. *American Journal of Industrial and Business Management*, 5(04), p.208.

⁵⁸⁵Environment Impact Assessments - The Maritime Archaeology Trust <http://maritimearchaeology.co.uk/environmentalassessments/?gclid=COauvou529QCFeuT7QodPucG mg> (Assessed on 25 June,2017).

⁵³⁹ Ibid.

⁵⁴⁰ Odey, Stephen Adi., 2015. Role of the Legislators in Environmental Governance in Nigeria. *IJHSSE* 2, (3), pp. 71-74.

⁵⁴¹ Ibid.

industry can work together with the NPA and other government organisation at the port to attain effective port waste management and turnaround for waste facilities to avoid the frequent breakdowns often experienced by the port users.⁵⁴²

The relevance of port waste management and waste reception facilities in the economic advancement and growth of a country's port is supreme. The main aspect of international trade is carried out via sea transportation; hence, the importance of sea ports in international trade.⁵⁴³ Without an effective port waste reception facility management system at the seaports, the achievement of international trade would be reduced and remain very slow. This is due to the fact that foreign ship might not be able to access the ports to load cargo or offload nor be secure if the ports are functional or the berths and anchorages are in good condition perhaps because of unmanaged waste.⁵⁴⁴ Ultimately, effective port waste reception facility management is expected to enhance a secure and safe ports waste management system, with the provision of efficient port reception facilities and piling space, quick ship sailing facilities, and effective and efficient clearing and billing forwarding services.⁵⁴⁵

Effective port waste reception facility management at the port is the key to successful international trade,⁵⁴⁶ because it will make available provision required over which international trade can be conducted effectively.⁵⁴⁷ However, in the situation whereby mismanagement of the ports waste reception facility system, there will be problems of delay, which will constitute further might affects international operations because of the ineffective waste management.⁵⁴⁸

⁵⁴² Lotilla, R.P.M., 1992. The Efficacy of the Anti-Pollution Legislation Provisions of the 1982 Law of the Sea Convention: A View from South East Asia. *International and Comparative Law Quarterly*, 41(01), pp.137-151.

⁵⁴³ Ibid.

⁵⁴⁴<http://www.globalacademicgroup.com/journals/pristine/THE%20JUDICIAL%20APPROACH%20TO%20ENVIRONMENTAL%20PROTECTION%20IN%20NIGERIA.pdf> (Assessed on 25 June 2017).

⁵⁴⁵ Ibid 586.

⁵⁴⁶ Orji, O. Goodhope, 2014. The Role of Effective Ports Management in Facilitating International Trade in Nigeria. *European Journal of Business and Management* 6, (13), pp. 204-215.

⁵⁴⁷ Ibid.

⁵⁴⁸ Potts, Tavis, Emma Jackson, Daryl Burdon, Justine Saunders, Jonathan Atkins, Emily Hastings, and Olivia Langmead.,2013. Marine Protected Areas and Ecosystem Services— Linking Conservation and Human Welfare. Unpublished report of the NERC-funded Valuing Nature Network, pp. 45.

The African Circle Pollution (ACP) is a company responsible for port waste management in West Africa, which comprises 16 nations. The capability of the African Circle Pollution is not in doubt regarding its capacity to handle port waste in all these countries, but in order to enhance the effective and comprehensive port waste management systems, each country will need to be individually responsible with regard to its own port waste management.⁵⁴⁹

Similarly, this system should be decentralised to allow the full participation of interested responsible companies in port waste management. It does seem, perhaps because of the over-centralisation of port waste reception facilities management in one company,⁵⁵⁰ that there have been undue setbacks in waste management and the availability of adequate reception facilities at the port. The research has indicated that the NPA performs oversight function with regard to port waste management, reception facilities and compliance with international regulations, as well as regional and national laws. However, more attention should have been given to a specialised department for effective waste management in ports in order to constantly oversee the affairs of ACP, with regard to an effective compliance level with the relevant laws.⁵⁵¹

4.5 General Overview of Port Waste Reception Facility Management

As earlier discussed, a basic management and regulatory legal-framework addressing port waste management and reception facilities is available and a number of areas and nations have taken proactive steps to address the challenges. Despite this, ineffective port waste management still affects some ports around the world. Thus, it indicates that port waste remains an abiding problem, particularly because of multifarious activities.⁵⁵² There are a range of reasons for port waste; however, some issues have been identified in the existing regulations that in fact stop the efficient

⁵⁴⁹ Ibid.

⁵⁵⁰ Ibid 596.

⁵⁵¹ Galgani, F., Hanke, G., Werner, S.D.V.L. and De Vrees, L., 2013. Marine Litter Within the European Marine Strategy Framework Directive. ICES Journal of Marine Science: Journal du Conseil, 70(6), pp.1055-1064.

⁵⁵² Ibid.

control of port waste management. They ultimately affect the provision of port waste reception facilities.

There appear to be several existing restrictions in the international legal framework addressing port waste management,⁵⁵³ including inadequate possibility with respect to the main sources of port waste, as well as problems relating to exceptions and the lack of implementation procedure.⁵⁵⁴ For example, UNCLOS recognises the reality of ports-based waste sources, nevertheless, it requested that individual nations should tackle the challenge based on domestic method.⁵⁵⁵ Furthermore, the lack of uniform enforcement procedure has made nations to apply different rules to reduce port waste within their port, and the language of UNCLOS appears very distinct on this matter. For example, it provides that nations “shall endeavour” to employ the “best practical methods to reduce port waste based on their capabilities”. This clause within the law has generated various interpretation by countries with different and contradictory legal systems, on environmental situations and capacities on port waste management.⁵⁵⁶

Therefore, implementation and enforcement of the legal regulations are the key components in the struggle to reduce port waste. However, it seems clear that international legal regulations are yet to be properly change into general management systems. The lack of implementation, operation, and penalties to discourage waste violators could make the legal framework inefficient.⁵⁵⁷ As matter of fact, the reviewed MARPOL Annex V is yet to be transferred into local legislation in some nations, including Nigeria; hence, lack of legal implementation of the reviewed Annex V at the national level.

The IMO Global Integrated Shipping Information System (GISIS), indicates that there are many matters reported of suspected insufficient of waste reception facilities, most

⁵⁵³ Chen, C.L., 2015. Regulation and Management of Marine litter. In *Marine Anthropogenic Litter* (pp. 554 -428). Springer International Publishing.

⁵⁵⁵ Ibid.

⁵⁵⁶ Depledge, M.H., Galgani, F., Panti, C., Caliani, I., Casini, S. and Fossi, M.C., 2013. Plastic Litter in the Sea. *Marine Environmental Research*, 92, pp.279-281.

⁵⁵⁷ Miller, D.G., Sabourenkov, E.N. and Ramm, D.C., 2004. Managing Antarctic Marine Living Resources: the CCAMLR Approach. *The International Journal of Marine and Coastal Law*, 19(3), pp.317-363.

especially in West African countries, including Nigeria.⁵⁵⁸ On the other hand, in the UK, the EU Directive is ambiguous concerning the about cost and fee recovery scheme. The switch of the EU Directive into national legislation generates various methods on incentive introduction for waste delivery at the ports. The introduction of various categories of waste fee schemes by the EU ports seems to have created misunderstanding among ship owners and operators, which has given some ships the opportunity to drop waste at the seaport in order to avoid payment of waste landing fees.

Another important observation with regard to port waste reception facilities and compliance levels is the acute problem of insufficient data.⁵⁵⁹ In the face of the existing structures with regard to port waste reception facilities, research indicates that the quantity and quality of waste facilities in port environments are still inadequate, and these gaps perhaps hamper the capacity to prioritise mitigating system and to evaluate the efficiency of implementation procedures. Specific data gaps have been identified in several studies.⁵⁶⁰ For instance, it appears that very small data exist on the numbers, trends, sources and port waste reception facilities in Sub-Saharan West Africa region comprising Nigeria, Ghana and others, and very minor is known about the scope and nature of the challenges in the other regions of Africa. The absence of up-to-date data on waste reception facilities at the port and the level of compliance in Nigeria have culminated perhaps in a lackadaisical attitude towards port waste schemes which has indeed led to ineffective port waste management.⁵⁶¹⁵⁶²

In the UK ports, waste reception facility deficiencies and non-compliance with various regulations were not that obvious. This could be due to adherence to international regulations and regional directives on port waste reception facilities and impacts of

558 Ibid.

559 Kopsick, D., 2011, June. Requirements for Effective Seaport Environmental Security: Collective Action at the Ports. In Proceedings of the 9th International Conference on Environmental Compliance and Enforcement (pp. 20-24).

560 Ibid.

561 Ankoma-Sey, Felicity.,2015. An Impact Assessment of Maritime Ports on Communities – A Case of Tema Port and Tema Newtown, Ghana. Research on Humanities and Social Sciences 5, (8), pp.

562 -38.

port wastes on seaport.⁵⁶³ However, unregulated, unreported and illegal shipping events and their influence on waste generation would have to be considered though. Thus, further observations are required in relation to longstanding and important monitoring across port surroundings.⁵⁶⁴ Consequently, it is important to take into consideration the relevant arguments adduced in this research for further development with regard to waste reception facilities at the port and compliance with the laws.

The formation of all-inclusive global ports waste management seems essential, in view of the incessant uncontrolled waste within ports all over the globe. This is because port waste is a trans-boundary governance problem, and social divisions.⁵⁶⁵ To challenge this problem, individual nations ought to have develop a general port waste system or an analogous management structure. This might require some commitment from nations to ensure that relevant actions are undertaking to ensure that port waste matters are echoed in all policymaking of the government.⁵⁶⁶ This type methods have the possibility to reduce previously mentioned deficiencies on port waste management. They should not only aim to reduce port waste,⁵⁶⁷ but also address the sources of waste from port multifarious activities and encourage a culture change with a view to considering waste as a valuable resource.⁵⁶⁸

The effective implementation of port waste management system by nations should have clear objectives: to promote an effective and unified monitoring and management system; implementation of a suite of actions associated with supervision,

⁵⁶³ Curtis, J.B., 1984. Vessel-Source Oil Pollution and MARPOL 73/78: An International Success story. *Envtl. L.*, 15, p.679.

⁵⁶⁴ Psaraftis, H.N., 2005. EU Ports Policy: Where do we go from Here? *Maritime Economics & Logistics*, 7(1), pp.73-82.

⁵⁶⁵ Hastings, E. and Potts, T., 2013. Marine Litter: Progress in Developing an Integrated Policy Approach in Scotland. *Marine Policy*, 42, pp.49-55.

⁵⁶⁶ Ibid.

⁵⁶⁷ Galgani, F., Hanke, G., Werner, S.D.V.L. and De Vrees, L., 2013. Marine Litter within the European Marine Strategy Framework Directive. *ICES Journal of Marine Science*, 70(6), pp.1055-1064. See also, Recommendations - Marine Anthropogenic Litter <http://academlib.com/25003/environment/recommendations> (Assessed 26 June 2017).

⁵⁶⁸ Potts, Tavis, Emma Jackson, Daryl Burdon, Justine Saunders, Jonathan Atkins, Emily Hastings, and Olivia Langmead.,2013. Marine Protected Areas and Ecosystem Services— Linking Conservation and Human Welfare. Unpublished report of the NERC-funded Valuing Nature Network, pp. 45.

infrastructure development, incentive schemes, research, education, compliance and implementation of the regulations; and develop private-public partnerships and community involvement. Such plans should be based on long-term port waste management system that accommodates full disposal and collection of waste services.⁵⁶⁹

In addition, in view of the principal resolutions, port waste management procedures may be generally separated into four groups: changing in behavioural attitude, removing, preventive, and mitigating as stated before.⁵⁷⁰ The creation of a new international legal framework aiming at the management problem in relation to port waste reception facilities, modifying current legal frameworks to reduce the exemptions and simplify the implementation procedures, creating an all-inclusive national port waste reception facilities management systems, enhancing the involvement and collaboration of nations with regard to international and regional legal framework, and developing measures to avoid waste from ships calling at various ports.⁵⁷¹

4.6 Summary

The negative effect of port waste management in Nigeria and the UK can be reduce via an effective corporation among the players in the maritime industries through; outreach programmes, strong regulations, policies, education, adequate implementation of the legal regulations, and a well structure policy for infrastructural development for port waste reception facilities. Based on this perspective, it is to be hoped that the identification of gaps in the current regulatory and management framework will contribute to improved management of port waste reception facilities. Finally, yet importantly, it has been observed that through the on-going efforts that are being deploy in this research, would recommend a collective vision for waste-free seaports surroundings would be realised among all the various actors and stakeholders concerned.

⁵⁶⁹ Liffmann, M. and Boogaerts, L., 1997. Linkages Between Land-Based Sources of Pollution and Marine Debris. In *Marine Debris* (pp. 359-366). Springer New York.

⁵⁷⁰ Liffmann, M., Howard, B., O'Hara, K. and Coe, J.M., 1997. Strategies to Reduce, Control, and Minimize Land-Source Marine Debris. In *Marine Debris* (pp. 381-390). Springer New York.

⁵⁷¹ Polglaze, J., 2003. Can we Always Ignore Ship-Generated Food Waste? *Marine Pollution Bulletin*, 46(1), pp.33-38.

This could be done by collaborative effort through individual stakeholders, to ensure port that is free of waste. On the challenges of port reception facilities, it appears more work needs to be done to ensure a proper turnaround of management in Nigeria and the UK. Another concern here is the location of such facilities and quick access to them. As elucidated above, adequate provision should be made in the event that the location of facilities is not within the immediate reach of the end users. The level of compliance on the part of ship-owners with regards to waste reception facilities need more attention beyond the above, as it might be difficult to safeguard against waste dumped at sea later finding its way to a port or shoreline and constituting an environmental hazard to the port. Thus, it does seem that collaborative effort between the regional ports management and ship-owners needs to be strengthened in order to avoid this unwelcome occurrence in port. To do this, stakeholders must be made aware of the dangers inherent in waste, as inimical to port growth and economic advancement.

Finally, much has been said on port waste management, reception facilities and compliance. However, to complement the above findings, the focus in the next chapter will be on articulating the research methodology appropriate for port waste management, through interviews conducted at the Southampton port, UK and the Apapa port in Lagos, Nigeria. The aim is to further establish robust and result oriented port waste management and the adequacy of reception facilities in both countries to meet the end-users.

CHAPTER 5

RESEARCH METHODOLOGY

5.1 Introduction

This chapter explains the methods and tools used to collect and analyse the data in this study. A comprehensive review of the qualitative research method, the process of data collection and justification of the choices involves in the research. This study adopted qualitative research approach for data collection via interviews with open-ended questions.⁵⁷² Due to the small number of participants and investment of this sort of data collection, the qualitative research findings cannot be generalised to the entire population. However, the data obtained can be used to carry out more extensive studies and a deeper understanding of specific situations.

Qualitative data assist the researcher in the identification of new phenomena that may arise when carrying out market research.⁵⁷³ It can provide a deeper understanding of the object of study with individual information. However, qualitative data analysis is considered complex due to the absence of pre-defined questions and structure, the flexibility of the respondents to answer and researchers' ability to interpret responses. In essence, qualitative research attempts to arrive at the "how" and "why" of a respondent's responses.⁵⁷⁴

The content analysis of qualitative study seeks to examine, first of all, what content the narrative communicates, seeking to understand "what the text says" and "why it says it", and "for who says it".⁵⁷⁵ The structural analysis prioritises "how" the narrative is structured to give a certain sense of interpretation to the listener, paying attention to linguistic, semantic, rhetorical or even unsaid resources. The previous theory chosen as the theoretical framework of the study serves as an interpretive resource

⁵⁷² Baker, S.E. and Edwards, R., 2016. How many qualitative interviews is enough? Expert voices and early career reflections on sampling and cases in qualitative research. 2012. Southampton; National Centre for Research Methods and ESRC. +

⁵⁷³ Taylor, S.J., Bogdan, R. and DeVault, M., 2015. Introduction to qualitative research methods: A guidebook and resource. John Wiley & Sons.

⁵⁷⁴ Creswell, J.W. and Poth, C.N., 2017. Qualitative inquiry and research design: Choosing among five approaches. Sage publications.

⁵⁷⁵ Schreier, M., 2014. Qualitative content analysis. The SAGE handbook of qualitative data analysis, pp.170-183.

for the narrative material analysed. Cho and Lee suggested some guiding questions for the analysis, which serve to examine the strategic placement by the narrator of elements that construct the narrative.⁵⁷⁶

This chapter of the study will be used to understand the methodological format integrated to achieve possible legal solutions to waste management at the ports. The objective is not to verify the effectiveness of this format empirically, but to relate the steps taken as a possible path for the research with ethical and political values. To a large extent it also addresses the social change, from the reconstruction of meanings through narratives.

5.2 Justification of the Chosen Methodology

The qualitative approach presupposes an analysis and interpretation of deeper aspects of the human behaviour. It provides more detailed analysis of investigations, habits, attitudes and behavioural tendencies. Cho and Lee, characterise qualitative research in certain aspects that responds to particular questions; to a level of authenticity that cannot be measured.⁵⁷⁷ It works with a range of connotations, motives, objectives, principles, standards, attitudes, which corresponds to a deeper space of relationships. The qualitative approach connects the processes and phenomena that cannot be reduced to the operationalisation of variables.

In view of the complexity of legal regulations, the implicit epistemological, ontological and ethical presuppositions have political contents and contexts in their implications. In this way, the different delineations lead to different results. In formation, qualitative methodology allows not only seeing the different scopes, phases and moments of a complex situation in it. It is sensitive to certain issues such as emotions, contexts and social interactions. It is also important to say that, as Sorsa, Kiikkala and Astedt-Kurki commented, the field work in the qualitative methodology is hardly developed according to plan and is, therefore, in constant construction. The research method within the qualitative methodology allows a better access to personal narratives, making possible to work with the material collected in greater depth, as pointed out by

⁵⁷⁶ Cho, J.Y. and Lee, E.H., 2014. Reducing confusion about grounded theory and qualitative content analysis: Similarities and differences. *The Qualitative Report*, 19(32), p.1.

⁵⁷⁷ Sorsa, M.A., Kiikkala, I. and Åstedt-Kurki, P., 2015. Bracketing as a skill in conducting unstructured qualitative interviews. *22(4)*, pp.8-12.

Cho and Lee.⁵⁷⁸ In addition, as this researcher affirms, this methodology allows particularities and relationships to be visualised and a better attention to the researched context is offered. It allows us to contemplate more broadly the complexity of the themes studied, coherent with analysis and discussions on waste management at the ports.

Qualitative studies can be conceptualised in different ways, according to the historical moment of the field and form of research. As Contandriopoulos et al. pointed out, when researchers construct a narrative, the historical moment in which researchers do it is especially relevant.⁵⁷⁹ In a general way, Flick, conceptualised them as "a situated activity" that delimits the observer in the world.⁵⁸⁰ According to the researcher, the qualitative study consists of a set of interpretative practices that make the world visible and that transform it. These practices convert the world into a series of representations, such as field diaries, interviews, conversations, photographs or recordings.

Qualitative research presupposes depth in results and without use of statistical analysis, its power of generalisation is less, because it aims to understand a situation, in a specific context. Qualitative studies involve the interpretation and study of the world in its natural environment, with attention to the meanings that subjects give to the lived phenomena, and the way they relate their lived experiences. Thus, "... to make reality intelligible, human beings need to resort to a narration of it, but in turn narratives that intersect to give reality to the world in which we live."⁵⁸¹

Narrative analysis involves political and ethical elements.⁵⁸² This method is effective in analysing the possible range of behaviours of the people about the issues under consideration, mainly to recognise their perceptions and motivations. Therefore, the target population of the research study is examined via a small group of people. Thus,

⁵⁷⁸ Cho, J.Y. and Lee, E.H., 2014. Reducing confusion about grounded theory and qualitative content analysis: Similarities and differences. *The qualitative report*, 19(32), p.1.

⁵⁷⁹ Contandriopoulos, D., Larouche, C., Breton, M. and Brousselle, A., 2015. A sociogram is worth a thousand words: proposing a method for the visual analysis of narrative data. *Qualitative Research*, p.1468794116682823.

⁵⁸⁰ Flick, U., 2017. *Doing Qualitative Data Collection—Charting the Routes*. *The SAGE Handbook of Qualitative Data Collection*, p.1.

⁵⁸¹ Merriam, S.B. and Tisdell, E.J., 2015. *Qualitative research: A guide to design and implementation*. John Wiley & Sons.

⁵⁸² Bryman, A. and Bell, E., 2015. *Business research methods*. Oxford University Press, USA.

qualitative studies tend to be deep studies based on objectives and hypothesis established through small groups of people, to understand the depth of experiences, behaviour, culture, social reality, and a phenomenon.⁵⁸³

The data collected via interviews is not numerical nor can it be defined with scales. Hence, qualitative research method is considered appropriate and open to the use of observations, texts, images, narratives, and conversations in context of data collected via interviews.⁵⁸⁴ As compared to other types of studies, qualitative research takes more time, requires more work, and better knowledge and understanding of the research area to interpret the responses. It allows adaptations during the development and progressive construction of the research.⁶³⁰

Merriam and Tisdell, found that qualitative studies are suitable for researches where the contribution of subjects is essential to address the research questions and objectives.⁵⁸⁵ These authors are referred as constructivists, who truly care about the views, experiences and behaviours of the subject. They are willing to commit to the study and recognise the fact that objectively deriving the meaning of things is not relevant. On the contrary, they realise that meaning of things is defined by people within a context. Therefore, when the context changes, so does the meaning.

The author's closeness to the study and the subjects allows him to develop a more effective viewpoint in the context and area of research. This is why, the qualitative approach helps to detect the complex and necessary points in the process of conducting the research with much attention to details and do not overlook necessary points.⁵⁸⁶⁵⁸⁷ In such a study, researcher might focus on more than one definition of the phenomena for interpretation and analysis of the research problem.⁵⁸⁸

⁵⁸³ Benbasat, I., Goldstein, D.K. and Mead, M., 1987. The case research strategy in studies of information systems. *MIS quarterly*, pp.369-386.

⁵⁸⁴ Gasson, S., 2004. Rigor in grounded theory research: An interpretive perspective on generating theory from qualitative field studies. *The handbook of information systems research*, 4, pp.79-102. ⁶³⁰ Leavy, B., 1994. The craft of case-based qualitative research. *Irish Journal of Management*, 15, p.105.

⁵⁸⁵ Merriam, S.B. and Tisdell, E.J., 2015. *Qualitative research: A guide to design and implementation*. John Wiley & Sons.

⁵⁸⁶ Bogdan, R. and Biklen, S.K., 1992. *Qualitative research for education*.

https://s3.amazonaws.com/academia.edu.documents/31190365/EDU7900_Qualitative_Research_for_Education.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1523089079&Signature=H

⁵⁸⁷ [POihKHGQAz%2BQZ4RJ00aqvDUbU%3D&response-content-disposition=inline%3B%20filename%3DQualitative_research_for_education.pdf](https://s3.amazonaws.com/academia.edu.documents/31190365/EDU7900_Qualitative_Research_for_Education.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1523089079&Signature=H) (Assessed on 2 March 2018).

⁵⁸⁸ Ibid.

The qualitative studies have ability to examine hidden, difficult objects complex objects such as institutions and social groups, combine different techniques of data collection, and to describe aspects of experiences live.⁵⁸⁹ Therefore, the results are not generalised and specific to the target population, geographical location, and other contextual factors. This give the interpretation and analysis of the information collected from respondents to give universal definition for all behaviours, views and experiences.⁵⁹⁰

The inductive approach is used to achieve the new knowledge from the results obtained from the study.⁵⁹¹ The study tends to produce new theory and does not need to prove existing theories. In qualitative studies observations play vital role as they allow the researcher to examine non-verbal communication of the subjects. For example: in forms of intonation, expressions and body language, as a part of their responses. The time for data collection, analysis and interpretation of them is extensive.⁵⁹² However, the qualitative research method also has some limitations that are considered in this study:

- The results of the study cannot be generalised and reproduced in larger contexts. Therefore, results are specific to population, country, and factors considered in the study.
- The researcher's own knowledge and presence affects subjects participating.⁵⁹³ Thus, researcher's own characteristics have impact on the results of the study.
- To determine the results of the study anonymity and confidentiality between the parties may reflect some issues that needed to be addressed by the researcher.

⁵⁸⁹ Watters, J.K. and Biernacki, P., 1989. Targeted sampling: options for the study of hidden populations. *Social problems*, 36(4), pp.416-430.

⁵⁹⁰ Sekaran, U. and Bougie, R., 2016. *Research methods for business: A skill building approach*. John Wiley & Sons.

⁵⁹¹ Kothari, C.R., 2004. *Research methodology: Methods and techniques*. New Age International. <https://books.google.co.uk/books?hl=en&lr=&id=hZ9wSHysQDYC&oi=fnd&pg=PA2&dq=The+inductive+approach+is+used+to+achieve+the+new+knowledge+from+the+results+obtained+from+the+study+&ots=1sVanHb1z5&sig=Dos6Lx07RJ2ElclhNMZIF4G6onQ#v=onepage&q&f=false> (Assessed on 9 March 2018).

⁵⁹² Ibid.

⁵⁹³ Noble, H. and Smith, J., 2015. Issues of validity and reliability in qualitative research. *Evidence Based Nursing*, pp. ebnurs-2015.

- The differences and similarities in the points of view of the researcher and participants are required to be explained for reason of partiality.
- The validity and reliability of the findings and results obtained in qualitative study are challenging and require a high level of seriousness in evaluating the sources used in the study.⁵⁹⁴ Therefore, application of conventional reliability standards is complex and may not facilitate the results of the study.

Based on these assumptions, the objective of this study is to present a qualitative methodology of critical narrative approach, as a possible format which is coherent with the theoretical bases of waste management on ports in the UK and Nigeria. Researchers understand that the redefinition and understanding of historical essentialisms present in discourses and narratives positions us politically for social change. Researchers study it from a reconstruction of meanings and destabilisation of bases that maintain inequality and reconstruction of new senses and experiences.⁵⁹⁵

Enhancement of the inductive exploitation of data and openness to the discovery of new facts, 'Inconvenient facts' or 'negative cases' are important characteristics of qualitative studies. Inductive data analysis helps the researcher in creating standards and categories of data analysis as well as identifying the meanings of the participants. Thus, the focus of the search is the meaning given by the participant to the problem researched. Evidence also presents the political character of language, the choice of words and ways of describing reality and the performing force of discursive practices as important factors in a qualitative research.⁵⁹⁶ In this study, epistemological axes were considered as integrators and coherent with the assumptions of a critical methodology: (a) social constructionism, (b) the ecological model and complexity.

⁵⁹⁴ Ibid.

⁵⁹⁵ Morse, J.M., 2015. Critical analysis of strategies for determining rigor in qualitative inquiry. *Qualitative health research*, 25(9), pp.1212-1222.

⁵⁹⁶ Ibid.

5.2.1 Social Constructionism

Qualitative research aims at describing, understanding and interpretation of the phenomenon in study.⁵⁹⁷ The data collection occurs in the place where the participants experience the problem studied. The researcher is a fundamental instrument: he collects the data in person, usually with his own protocol. This perspective starts from some basic principles, for example: (a) the idea that human build the world; (b) language is a producer of realities; (c) everything that humans accept as obvious can be questioned; and (d) the truth is derived from shared modes of life within a group and there is no single, absolute and legitimating truth.⁵⁹⁸

According to Dalal and Priya, this perspective is based on a critique of positivist and modern psychology, in accordance with postmodernist ideals.⁵⁹⁹ This perspective suggests that knowledge is based on social processes and historical and cultural specificities. The meaning of language derives from the way of functioning within relational patterns. It implies, in the words of Taylor, Bogdan, and DeVault, "putting what has been lived into words, as ideas and emotions". It re-signifies experiences, to make sense of one's own history by re-naming and re-creating a series of events.⁶⁰⁰

In addition, Noble and Smith affirmed that knowledge and social action walk together. The authors understood these practices as partial, dominated by values, and questions the idea of objective facts. According to this perspective, each way of constructing the world is supported by certain traditions and particular values, ignoring everything that is outside them. For Morse, this perspective is anti-essentialist, antirealist, of attention to the historical and cultural specificity of knowledge.⁶⁰¹ Therefore, information shared by an individual is considered as a prior condition of thought and as a form of social action, and importance is given to interaction, processes and social practices. This emphasis on social action is very relevant for the

⁵⁹⁷ Fossey, E., Harvey, C., McDermott, F. and Davidson, L., 2002. Understanding and evaluating qualitative research. *Australian and New Zealand journal of psychiatry*, 36(6), pp.717-732.

⁵⁹⁸ Ibid.

⁵⁹⁹ Dalal, A.K. and Priya, K.R., 2016. Introduction to qualitative research. *Qualitative Research on Illness, Wellbeing and Self-Growth: Contemporary Indian Perspectives*.

⁶⁰⁰ Taylor, S.J., Bogdan, R. and DeVault, M., 2015. *Introduction to qualitative research methods: A guidebook and resource*. John Wiley & Sons.

⁶⁰¹ Morse, J.M., 2015. Critical analysis of strategies for determining rigor in qualitative inquiry. 25(9), pp.1212-1222.

construction of legal regulations, allowing theoretical connections and important reflections in the field of waste management.

5.2.2 The Ecological Model

The ecological model indirectly and transversally influences this methodological format to offer a more comprehensive and contextualised reading of the information, and in the relations with the complexity.⁶⁰² This approach allows the researcher to think about the micro to the macro system, paying attention to broad cultural contexts, participate in norms and mandates. Bronfenbrenner summaries these systems are:

- The microsystem (closest context, direct relationships, family)
- The mesosystem (relations between the microsystem and work relations, friendship, social services)
- The ecosystem (the closest community, institutions, media, judicial organs)
- The macrosystem, (broader context, belief systems, lifestyles, cultures, subcultures, generalised patterns)
- The chronosystem (history of personal experience) of the individual, spectrum of historical factors of development and interaction in the microsystem).⁶⁰³

As Bronfenbrenner explained from the microsystem and the narratives, this doctoral research sought to launch a critical look at the macrosystem, exploring its interaction and influence on the microsystem and the subjectivity of each competitor.⁶⁰⁴ The theory of complexity is in line with the ecological model. In his writings on complex thinking, Bronfenbrenner criticised linear thinking, highlighting the importance of transdisciplinary and inter-subjectivity.⁶⁰⁵ The complex thought contemplates a certain permanent tension between the commitment of a non-parcelled, undivided or

⁶⁰² Ram, N., Brinberg, M., Pincus, A.L. and Conroy, D.E., 2017. The questionable ecological validity of ecological momentary assessment: Considerations for design and analysis. *Research in Human Development*, 14(3), pp.253-270.

⁶⁰³ Vélez-Agosto, N.M., Soto-Crespo, J.G., Vizcarrondo-Opppenheimer, M., Vega-Molina, S. and García Coll, C., 2017. Bronfenbrenner's bioecological theory revision: Moving culture from the macro into the micro. *Perspectives on Psychological Science*, 12(5), pp.900-910.

⁶⁰⁴ Barnyak, N.C., 2011. A qualitative study in a rural community: Investigating the attitudes, beliefs, and interactions of young children and their parents regarding storybook read alouds. *Early Childhood Education Journal*, 39(2), pp.149-159.

⁶⁰⁵ Ibid.

reductionist knowledge and the fact of recognising the unfinished, incomplete knowledge. These paradigmatic and epistemological scores are very important to delineate the pretensions.

The integration criteria and the foundation of the subject studied in this investigation that I point as an example. Since, from this reading I start from the assumption of the object of study to the context and its antecedents. In this sense, it is valid to point out the non-separation of the observer, as Hewell, Vasquez, and Rivkin observed in complex thought. So that in this investigation the reflections and interpretations of the researcher are integrated into knowledge, as parts of the presented reality.⁶⁰⁶

On the waste management perspective, it is understood that there is a correlation between our social activities and legal regulations. In this way, knowledge is localised and integrated between the researcher and the object, thus being impossible to have the transcendence between subject and object.⁶⁰⁷ In this sense, I consider that the methodology of this doctoral study includes the subjectivity and reflections of the person who observes and investigates by expanding the information presented.

The systematic study of legal regulations of port waste management procedures is conducted in this study to understand the strategy used by the UK and Nigeria in addressing waste at their respective ports. The case study of the two legal frameworks provides a comprehensive empirical description of particular instances regarding the procedure and strategies. The process of conducting case studies occurs through recursive recycling among the case data, emerging theory and later, existing literature.⁶⁰⁸ The outcome of which accentuated the in-depth context in which the phenomena occur. The central notion of this study is how the legal framework of port waste management can be improved for more effective waste management at the port.

A case study of Southampton and Apapa port would be used as the basis from which to advance and expand existing approaches of waste collection, treatment and its management at the ports. This will further give an interchange of ideas and methods

⁶⁰⁶ Hewell, V.M., Vasquez, A.R. and Rivkin, I.D., 2017. Systemic and individual factors in the buprenorphine treatment-seeking process: a qualitative study. *Substance abuse treatment, prevention, and policy*, 12(1), p.3.

⁶⁰⁷ Ibid.

⁶⁰⁸ Ruona, W.E., 2005. Analyzing qualitative data. *Research in organizations: Foundations and methods of inquiry*, 223, p.263.

used at both ports, to address the challenges of waste at the port within the case study. It will subsequently give a holistic and broad-based understanding of how respondents describe port waste management from their own perspective with a view to get unadulterated information about the findings.

5.3 Key Research Objectives

The key objective of this thesis is to present an exploratory account of the legal regulation's procedure of port waste management, implementation and its effectiveness to reduce waste at the port. As earlier enunciated in the research, there are other accounts of the interventions, roles and strategies, adopted by the UK and Nigeria ports on waste management. Though, the methods and forms of port waste management that takes place at the port is to some is well structured. Nevertheless, waste still finds its way to the port, and seems often impede port activities. The methodology is designed to robustly engage port's stakeholders with a view to underscore different strategy of port waste management.

5.4 Method of Data Collection

The specific phenomenon this research focuses on is port waste management, and the method of waste management in both the UK and Nigeria ports. And the method of data collection was through semi-structured interviews among the port officials.⁶⁰⁹ In the course of the discussions, questions were directed at the respondent's in form of interaction, intervention and experience of which are related to the research, for example; effectiveness of the legal framework, effectiveness of port reception facilities and what can further be done to ensure waste reduction within the port.⁶¹⁰ More details on the interview schedule adopted for this research is provided in appendix 3.

5.4.1 Interview Design

The interview design of data capturing during qualitative research, suggested that interviews can be seen as an exchange or interchange of ideals among two persons,

⁶⁰⁹ Kensit, D.A., 2000. Rogerian theory: A critique of the effectiveness of pure client-centred therapy. *Counselling Psychology Quarterly*, 13(4), pp.345-351. Also, Rowan, J., 2000. Research ethics. *International Journal of Psychotherapy*, 5(2), pp.103-111.

⁶¹⁰ Caelli, K., 2001. Engaging with phenomenology: is it more of a challenge than it needs to be?. *Qualitative Health Research*, 11(2), pp.273-281.

discussing about a challenge of joint interest.⁶¹¹ During this process, the researcher attempts to understand the port waste management from the view point of the respondent in order to understand the meaning of their experience.⁶⁵⁷ The intent of the researcher during this discussion was to generate a description of human experience as described by port officials.⁶¹² In the course of this interaction, the essence of the process emerges and thus, bringing the study back to those involved in the process themselves.⁶¹³

Another vital source of qualitative research design used in this study is memoing.⁶¹⁴ Memoing is the field note, which is used to record what the researcher sees, experiences, sees and thinks in the process of gathering and reflecting on the procedures.⁶¹⁵ During the data collection process, it becomes evident many researchers often engrossed in the collection of data process and may forget to think on what is happening. Given this situation, the researcher is required to preserve a stability between descriptive notes and reflective notes. In the process of collection of data, the researcher captured the process of waste collection at the port, implementation of waste management laws and strategies deployed to reduce waste at the port. This process was carried out mainly with the use of mind maps and sketching of diagrams. Huberman, A.M. and Miles, M.B, in their study emphasise that memos should be dated so that the researcher can subsequently compare with the data that was collected.⁶¹⁶

⁶¹¹ Dearnley, C., 2005. A reflection on the use of semi-structured interviews. *Nurse researcher*, 13(1). ⁶⁵⁷ Ryan, F., Coughlan, M. and Cronin, P., 2009. Interviewing in qualitative research: The one-to-one interview. *International Journal of Therapy and Rehabilitation*, 16(6), pp.309-314.

⁶¹² Qu, S.Q. and Dumay, J., 2011. The qualitative research interviews. *Qualitative research in accounting & management*, 8(3), pp.238-264.

⁶¹³ Cameron, M.E., Schaffer, M. and Park, H.A., 2001. Nursing students' experience of ethical problems and use of ethical decision-making models. *Nursing ethics*, 8(5), pp.432-447.

⁶¹⁴ Wade, J., Donovan, J.L., Lane, J.A., Neal, D.E. and Hamdy, F.C., 2009. It's not just what you say, it's also how you say it: opening the 'black box' of informed consent appointments in randomised controlled trials. *Social science & medicine*, 68(11), pp.2018-2028.

⁶¹⁵ Miles, M.B., Huberman, A.M., Huberman, M.A. and Huberman, M., 1994. *Qualitative data analysis: An expanded sourcebook*. sage.

⁶¹⁶ Huberman, A.M. and Miles, M.B., 1994. *Data management and analysis methods*.

5.4.2 Sampling and Respondents

This study focuses more on the types of intervention, styles and strategies that are adopted by the ports to ensure waste free environment. The central research question of the study is: how can the study generate new recommendations that will enhance existing methods and legal regulations of port waste management for adequate waste management? Collection of data was done via semi-structured interviews among port officials, ship-owners and licensed waste collector agent's representatives within the Southampton port and Apapa port. In the course of the discussions, questions were directed at the respondent's such as, methods of waste collection, availability of waste reception facilities, effectiveness of the legal regulation's intervention and quick access to waste disposal at the port.

Respondents were selected through a list of contact supplied by the Southampton port. Similarly, in the case of Apapa Port, the operational manager of the port gave the researcher the list of respondents that could contribute to the subject matter of the study. The selection of respondents was based on the objectives and purpose of the researcher, the willingness and availability of the respondents and judgment of the researcher. All the interviews were arranged and conducted with the informed consent of the respondents. Participation in the study was based on the willingness and availability of respondents.⁶¹⁷ In order to trace additional respondents, the study adopted snowball sampling Crabtree and Miller.⁶¹⁸ This enabled the researcher to identify suitable respondents by asking participants to recommend others for interviewing.

Ship-owners and waste license agents from both ports in the UK and Nigeria were selected based on their involvement during the disposal of waste at the port. Through this interview, individuals who would be able to provide insight into the handling of waste at the port were identified for interview. This process served as an important source of information for the overall case study and the selection of respondents. This process was based on prior contact, willingness and availability of respondents.

⁶¹⁷ Arksey, H. and Knight, P.T., 1999. Interviewing for social scientists: An introductory resource with examples. Sage. And see Groenewald, T., 2004. A phenomenological research design illustrated. *International journal of qualitative methods*, 3(1), pp.42-55.

⁶¹⁸ Miller, W.L. and Crabtree, B.F., 1992. Primary care research: A multimethod typology and qualitative road map.

Surprisingly, no request for interview was refused based on the formal contact established by the researcher. However, some of respondents reduced time initially agreed for the interview; nevertheless, they were able to provide more in-depth response to the questions raised within the space of time for the interview summarily. The purpose of data collection via three different types of respondents during the case study at the port was a form of triangulation.⁶¹⁹ This was aimed at contrasting and validating the data obtained from the initial study conducted among ports management. The researcher also took memos and field notes in the process of the interviews. The process of reflecting on the field notes and memos that were taken while collecting the data directed the researcher to consider how the port waste management process can be better understood from an insider's viewpoint as opposed to a broader perspective.

In line with the overall research methodological approach, the sampling was not statistical but was purposive and in practice based on convenience and snowball sampling. This was designed to provide a wide variety of relevant actors and frame a critical case study.

Table 5.1 below provides an anonymous summary of all the respondents from both the Southampton and Apapa ports, indicating who they are and their position within their organisation.

Table 5.4: list of respondents

Names (Anonymous) Southampton Respondents	Role of respondent	No. of interviews
SR 1	Port Managers	2
SR 2	Southampton port staff	1
SR 3	Represent ship-owner	2
SR 4	Viola Environmental Services Plc	1
SR 5	Biffa Waste Services Ltd	1
SR 6	Terminal Control director	1

⁶¹⁹ Van Teijlingen, E.R. And Hundley, V., 2001. The Importance of Pilot Studies. See Also Van Teijlingen, E. And Hundley, V., 2002. The Importance of Pilot Studies. Nursing Standard, 16(40), pp.33-36.

Apapa Port (Anonymous) Apapa Respondents		
AR 1	Apapa Port, Managers	3
AR 2	Nigerian Port Authority	2
AR 3	NIMASA Representative	3
AR 4	National Inland Waterways Authority	1
AR 5	Nigeria Waste Management Authority	1
AR 6	African Circle Pollution Management Limited	2
AR 7	Nigerian Shippers Council	2
AR 8	Maritime Workers Union of Nigeria	1

5.4.3 Interview Process

Hycner (1999) highlighted the phenomenon under study dictates the method of data collection and type of respondents. In the present study, respondents were selected based on the objectives, purpose, and research problem, as well as researcher's own judgment Greig and Taylor 1999; Hycner 1999; Welman and Kruger 1999; Schwandt 1997; Babbie 1995.⁶²⁰ The study made use of a total of fifteen interviews, which were arranged and conducted with the informed consent of the respondents Welman and Kruger 1999; Schwandt 1997; Babbie 1995.⁶²¹ This study allowed the data to materialise from the discussion without any form of interference, thus, enabling the capture of the rich descriptions of the phenomena. Collection of data was done via the

⁶²⁰ Ejimabo, N.O., 2015. The Effective Research Process: Unlocking the Advantages of Ethnographic Strategies in The Qualitative Research Methods. *European Scientific Journal*, ESJ, 11(23).

⁶²¹ Welman, J.C. And Kruger, S.J., 1999. *Research Methodology for The Business and Administrative Sciences*. Johannesburg, South Africa: International Thompson. White, B. (2011). Private Perceptions, Public Reflections: Aesthetic Encounters as Vehicles for Shared Meaning Making. *International Journal of Education & The Arts*, 12(2), pp.1-24.

use of semi-structured interviews with respondents. The flexibility provided by semi structured interviews allowed the concepts reflected in the question to motivate discussions in an attempt to provide an inductive process of gathering data to be revealed.

In the words of Bailey, the semi-structured interview is a conscious attempt by the researcher to discover more information about the way the respondents perceive their role.⁶²² This cannot be achieved with structured interviews because the discussions are based on predetermined and standardised questions. Unstructured interviews cannot be used to further explore the research questions because the discussions are not guided by predetermined list of questions which the researcher can work through Saunders and Lewis.⁶²³

According to Myers, the use of semi-structured interviews can be described as a source of thematic guide from which probes can be generated and which allows for a penetration beyond initial answers.⁶²⁴ This flexibility provided insight into the connection that exist connection between port management officials, ship-owners and waste license agents. Structured interviews would not have allowed this process to unfold because it does not permit both the research and respondents the flexibility that is required to express their views.

Unstructured interviews are more like conversation than interviews and since there is no order or script, the researcher would have no guide from which probes can be generated Kensit 2000; Bentz and Shapiro.⁶²⁵ (see appendix 1 for interview details). All the interviews conducted during this study were hand written. The duration of interviews ranged between forty-five minutes and one hour and there were wide-ranging questions for different respondents.⁶²⁶ During this study, respondents were

⁶²² Bailey, P.H., 1996. Assuring quality in narrative analysis. *Western Journal of Nursing Research*, 18(2), pp.186-194. And see, Whittemore, R., Chase, S.K. And Mandle, C.L., 2001. Validity in Qualitative Research. *Qualitative Health Research*, 11(4), pp.522-537.

⁶²³ Saunders, M.N. And Lewis, P., 2012. *Doing Research in Business & Management: An Essential Guide to Planning Your Project*. Pearson.

⁶²⁴ Myers, M.D., 1997. Qualitative Research in Information Systems. *Management Information Systems Quarterly*, 21(2), pp.241-242.

⁶²⁵ Deery, M., Jago, L. And Fredline, L., 2012. Rethinking Social Impacts of Tourism Research: A New Research Agenda. *Tourism Management*, 33(1), pp.64-73.

⁶²⁶ Åkerlind, G.S., 2012. Variation and Commonality in Phenomenographic Research Methods. *Higher Education Research & Development*, 31(1), pp.115-127.

interviewed on more than one occasion. The repeat interview allowed issues from preceding discussions to be clarified and the veracity of information to be assessed.

Interviews were conducted in several locations at the port, between 1st December 2015- and 14th August 2016), most interviews took place in various offices in Southampton port and Apapa port. A room was allocated for the interviews and privacy and confidentiality was assured. Interviews with the port director and senior staff took place in their offices in private both in the UK and Nigeria. Interviews with licensed waste collector agents' representatives also took place in their offices both in the UK and Nigeria. In the later stage of the research, several interviews took place over the telephone. During these interviews, respondents engaged in conversations about how they perceived the legal regulations at work to eliminate all forms of waste at the port their forms of interactions.⁶²⁷

5.5 Method of Data Analysis

The analysis of the material collected by interviews and field journals were divided into two stages: (a) a first stage of preparation, organisation and initial analysis based on grounded theory, using some resources of the qualitative analysis; (b) a second stage more focused on the content, structural and interpretative analysis of the narratives selected in the first stage.

5.5.1 The First Stage of Analysis and Organisation of the Material:

The grounded theory method consists of guidelines that help those who investigate the social processes, in order to achieve new theoretical development.⁶²⁸ According to Glaser, in this method the collection of materials, management of analysis and development of a theoretical framework takes place.⁶²⁹ As per Knigge, identification relies on flexible analysis strategies to focus and accelerate the collection of material and analysis.⁶³⁰ The founded theory follows, since its creation, two different possible formats: the constructivist and the objectivist. This research is based on the first

⁶²⁷ Byrne, M.M., 2001. Evaluating the Findings of Qualitative Research. *AORN Journal*, 73(3), p.706.

⁶²⁸ Strauss, A. and Corbin, J., 1994. Grounded theory methodology. *Handbook of qualitative research*, 17, pp.273-285.

⁶²⁹ Glaser, B., 2017. *Discovery of grounded theory: Strategies for qualitative research*. Routledge. Vancouver.

⁶³⁰ Knigge, L.G., 2017. Grounded Theory. *The International Encyclopedia of Geography*.

format, in coherence with the theoretical and epistemological foundations of this study, which prioritises the study of the phenomenon and includes the collected materials and analysis as creations derived from the shared experience of the researcher and the participants and even the researcher's own relationship with the participants. In this format, the method is seen as a means, rather than an end in itself in the research process.

Constructivist studies focus on how participants construct meanings and actions. Gehman et al., suggested that the information is seen as constructions that, in addition to being located in a context, space, place and culture, reflect the thoughts of the researcher.⁶³¹ Under the constructivist vision, the researcher seeks to know the implicit meanings of the experience of the participants in order to construct a conceptual analysis of these meanings, seen as constructions of reality. The aim is to study how actions and meanings are constructed. Charmaz, emphasised that the constructivists focus is on exploring and defining processes.⁶³² Based on this constructivist side, Morey, Steven, and Pearson, suggested that the information obtained with the interviews and in the field, diary was organised, following criteria of organisation and initial analysis of the grounded theory, with the intention of establishing categories.⁶³³ However, in this doctoral research, I have used only some of these resources (in order to focus on the second stage of narrative analysis), mainly as a form of preparation and organisation of information in the first stage of analysis of the material collected. The objective in the use of the programme was to organise all the narrative material in units of meaning and analysis, to which initial registration and classification keys were assigned. This has been characterised as segmentation and coding, that is, extraction of fragments, paragraphs, sentences or long narrations considered significant for the proposed study.⁶³⁴

⁶³¹ Gehman, J., Glaser, V.L., Eisenhardt, K.M., Gioia, D., Langley, A. and Corley, K.G., 2017. Finding Theory–Method Fit: A Comparison of Three Qualitative Approaches to Theory Building. *Journal of Management Inquiry*, p.1056492617706029.

⁶³² Charmaz, K., 2017. The power of constructivist grounded theory for critical inquiry. *Qualitative inquiry*, 23(1), pp.34-45.

⁶³³ Morey, S., Steven, A. and Pearson, P., 2017. Co constructing A Complex Narrative Using Constructivist Grounded Theory. *International Journal of Qualitative Methods*, 16(1), p.14.

⁶³⁴ Creswell, J.W. and Creswell, J.D., 2017. *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

All the material has gone through exhaustive readings and analysis in a vertical manner (in-depth analysis of the same interview or group story) and horizontal analysis (in-depth comparative analysis between the different interviews and stories).⁶³⁵ This stage was carried out from theoretical reflections and revisions of the material collected from interviews. The categories obtained, after an intense and continuous review, were divided into two large dimensions of study.

This type of organisation of the materials has made it possible the integration of different means used in the collection of information. After this first stage, the material collected and organised, were divided into two large dimensions, which were analysed, studied and deepened analytically. From the second methodological stage, thematic, structural and interpretative narrative analysis all these were in dialogue and coherence with the critical legal and theoretical bases.⁶³⁶ This stage will be explained in the following section.

5.5.2 The Second Stage of Content Narratives Analysis

The second stage of analysis of this research consisted of a meticulous work of content, structural and interpretative narrative analysis, which were used as tools of deconstruction and critical reflection, based on the specialised literature and the epistemological foundations chosen for this research (especially the work of J. Butler). The approach of the narratives is to observe how the narrator imposes order in his experience, in his narrative sequence, in order to give meaning to the events and actions of his life.⁶³⁷

In this sense, the studies sought to analyse and examine how the narrator makes use of linguistic and cultural resources and persuades the listener regarding the authenticity of their narrative. Considering that the personal narrative needs a structure to sustain itself, it is observed that the events become significant according to the place they occupy in the narratives. As Contandriopoulos et al., pointed out "paying attention to how we construct the world requires that we do not omit how the

⁶³⁵ Morey, S., Steven, A. and Pearson, P: supra note 663, p.14-15.

⁶³⁶ Willig, C., 2017. Interpretation in Qualitative Research. *The SAGE Handbook of Qualitative Research in Psychology*, p.274.

⁶³⁷ Ibid.

world is constructed precisely from discourses and social practices that occupy a place of privileged enunciation".⁶³⁸

It should be considered that according to Bryman and Bell, the study of narratives usually focuses on a small number of subjects.⁶³⁹ This happens because in studies like this, we seek an in-depth, detailed and meticulous analysis of narratives, without the intention of a generalisation. In this sense, when doing the doctoral research, it is important to pay attention to critical aspects directed to the context and social interaction. Thus, the analysis focused on details of the narrative,⁶⁴⁰ providing critical reflections on dominant discourses and their relationships with subjectivity and power relations in society.

Middleton, L. and Uys, L seek to highlight social practices, usually taken for granted, defined, not explored.⁶⁴¹ The researcher seeks to interconnect his research question with methods, epistemology and adequate theoretical perspectives, constructing an interpretative account of results in a compilation of the narrated stories collected in the field of research.⁶⁴² It is important to clarify the difference between the content analysis method and the in-depth analysis made by grounded theory (Grounded Theory).⁶⁴³ The main difference lies in the fact that narrative studies focus on a case study (in this study it is characterised by the case of a specific group process and its participants), exploring in depth not only the content but also the rhetorical structure and the use of language.⁶⁴⁴ In this study the principles of organisation and initial analysis of the grounded theory (my first analytical stage) was combined with the narrative studies (my second analytical stage), to contemplate the objectives proposed in the research.⁶⁴⁵

⁶³⁸ Morse, J.M.; supra note 629, pp.1212-1222.

⁶³⁹ Eriksson, P. and Kovalainen, A., 2015. *Qualitative methods in business research: A practical guide to social research*. Sage.

⁶⁴⁰ Eriksson, P. and Kovalainen, A., 2015. *Qualitative methods in business research: A practical guide to social research*. Sage.

⁶⁴¹ Middleton, L. and Uys, L., 2009. A social constructionist analysis of talk in episodes of psychiatric student nurse's conversations with clients in community clinics. *Journal of advanced nursing*, 65(3), pp.576-586.

⁶⁴² Ibid.

⁶⁴³ Vourvachis, P. and Woodward, T., 2015. Content analysis in social and environmental reporting research: trends and challenges. *Journal of Applied Accounting Research*, 16(2), pp.166-195.

⁶⁴⁴ Hancock, D.R. and Algozzine, B., 2016. *Doing case study research: A practical guide for beginning researchers*. Teachers College Press.

⁶⁴⁵ Ibid.

According to Eriksson and Kovalainen, the types, concepts and possibilities of narrative studies are diverse.⁶⁴⁶ Schreier, pointed out the need for the researcher to define how he conceptualises the term narratives in their study, considering the variability of definition possibilities, comprehension and study techniques.⁶⁴⁷ In addition, it recommends clarifying to what extent attention will be paid to form and language, to the local context of production and to social discourses, in the chosen analysis.

The chosen theoretical and epistemological bases must also be explained. From these clarifications, we define the path used by the analysis, a path that is not rigid, that is adaptable to the study and proposed objectives and chosen perspectives, but that maintains a rigor of analysis and interpretation necessary in studies qualitative.⁶⁴⁸ The term narrative is reserved for a limited unit of expression rather than a complete biography.⁶⁴⁹ Personal narratives are defined, according to Cho and Lee, as a personal history of the respondent, which includes a discursive, coherent and subsection of an interview.⁶⁵⁰ This is constructed in real time in the interview, privileging the point of view, voice and experience of the respondent, and the construction of meanings, related to a certain area of interest of an investigation.

In this way, Mayring comments narratives are considered as a specific type of discourse.⁶⁵¹ Discourse, in turn, is the most general category of linguistic production, and narratives would be a set of culturally and historically transmitted linguistic and psychological structures, delimited by the level of the domain of each subject and by the combination of socio-technical, communicative and linguistic skills.⁶⁵² Narratives that are acquired in inter-subjective contact and allow multiple interpretations, seek to

⁶⁴⁶ Eriksson, P. and Kovalainen, A., 2015. *Qualitative methods in business research: A practical guide to social research*. Sage.

⁶⁴⁷ Chidlow, A., Plakoyiannaki, E. and Welch, C., 2014. Translation in cross-language international research: Beyond equivalence. *Journal of International Business Studies*, 45(5), pp.562-582.

⁶⁴⁸ Ibid.

⁶⁴⁹ Mayring, P., 2014. *Qualitative content analysis: theoretical foundation, basic procedures and software solution*.

⁶⁵⁰ Cho, J.Y. and Lee, E.H., 2014. Reducing confusion about grounded theory and qualitative content analysis: Similarities and differences. *The qualitative report*, 19(32), p.1.

⁶⁵¹ BERNING, N., 2014. Narrative Journalism from a Transdisciplinary Perspective: A Narratological Analysis of Award-Winning Literary Reportages. *Beyond Classical Narration: Transmedial and Unnatural Challenges*, 42, p.117.

⁶⁵² Forman, J. and Damschroder, L., 2007. Qualitative content analysis. In *Empirical methods for bioethics: A primer* Emerald Group Publishing Limited. pp. 39-62.

give intelligibility to the lived world, to the reality of each subject. The narrations are constructed in social practices, in which, through their use, we construct subjectivities, objectivity, reality and fiction and create a referential framework, stories and facts.⁶⁵³ It is through them that we reproduce and transform the social order, which makes this type of analysis extremely appropriate for the objectives of this doctoral research. According to Vaismoradi, Jones, Turunen, and Snelgrove, narratives are constructors of identity, self and subjectivity.⁶⁵⁴ Vaismoradi et al., suggested that the consequences of thinking about subjectivity (which these researchers call self) began to be explored from narratives, as a human process in which meanings are produced through language.⁶⁵⁵ This occurs from a distancing of cognitive psychology and its vision of a computer machine, which according to Vaismoradi et al is limited.⁶⁵⁶ In a postmodern vision, subjectivity is understood through language and narration. In this sense, it was understood in this doctoral study that this notion of subjectivity is elaborated by means of multiple narrations that are confirmed, reiterated and reproduced in the social, in the contact with the other. Narratives are not just words, they are actions capable of building, updating and maintaining realities.⁶⁵⁷ According to Graneheim, Lindgren, and Lundman, subjectivity is not something stable and lasting, it is an autobiography that is constantly written and rewritten insofar as we participate in social practices that we describe in our changing narrations.⁶⁵⁸ Defined the concept of narrative that was used in this doctoral study and clarified the theoretical assumptions used and epistemological, then we will define the choices of techniques and the types of narrative analysis used in this doctoral study.⁶⁵⁹

⁶⁵³ Ibid.

⁶⁵⁴ Vaismoradi, M., Jones, J., Turunen, H. and Snelgrove, S., 2016. Theme development in qualitative content analysis and thematic analysis. *Journal of Nursing Education and Practice*, 6(5), p.100.

⁶⁵⁵ Ibid.

⁶⁵⁶ Vaismoradi, M.: supra note 673, pp. 100-180.

⁶⁵⁷ Qu, S.Q. and Dumay, J., 2011. The qualitative research interviews. *Qualitative research in accounting & management*, 8(3), pp.238-264.

⁶⁵⁸ Graneheim, U.H., Lindgren, B.M. and Lundman, B., 2017. Methodological challenges in qualitative content analysis: A discussion paper. *Nurse Education Today*.

⁶⁵⁹ Ibid.

It should be considered that according to Graneheim et al., the study of narratives usually focuses on a small number of subjects.⁶⁶⁰ This happens because in studies like this we seek an in-depth, detailed and meticulous analysis of narratives, without the intention of a generalisation. In this sense, Vaismoradi et al., paid attention to critical aspects directed to the context and social interaction.⁶⁶¹ Thus, the analysis focused on details of the narrative, providing critical reflections on dominant discourses and their relationships with subjectivity and power relations in the society. I seek to highlight social practices, usually taken for granted, defined, not explored. The research seeks to interconnect research question with methods, epistemology and adequate theoretical perspectives, constructing an interpretative account of results in a compilation of the narrated stories collected in the field of research.

5.5.3 Content Analysis

The content analysis provides a platform of exploring the nature of the speech. It is a technique that help analysing the materials of the human message.⁶⁶² Generally, the detail of such data can be examined in part and depth; in oral, iconic, gestural, sign language code.⁶⁶³ The quantity of people participated in the communication (mass communication, few group of person, dialogue, group restricted,), ability to use any instrument of data such as, agendas, announcements, records, letters, surveys, television, projective tests, books, interviews and radio.⁶⁶⁴ Content analysis is conducted for both qualitative or quantitative data, but for the purposes of this research, it is used to analyse the qualitative aspect of data analysis which I considered very appropriate for data collected via interviews.

In recent years this method has restricted the limits of the demography of interpretation that is used in increasingly diverse frameworks, from the content of the individual constructions as an supplementary technique to the analysis of obtained data, through

⁶⁶⁰ Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K. and Kyngäs, H., 2014. Qualitative content analysis: A focus on trustworthiness. *Sage Open*, 4(1), p.2158244014522633.

⁶⁶¹ Ibid.

⁶⁶² Boréus, K. and Bergström, G., 2017. Content analysis. *Analyzing Text and Discourse: Eight Approaches for the Social Sciences*, 23.

⁶⁶³ Hsieh, H.F. and Shannon, S.E., 2005. Three approaches to qualitative content analysis. *Qualitative health research*, 15(9), pp.1277-1288.

⁶⁶⁴ Forman, J. and Damschroder, L., 2007. Qualitative content analysis. In *Empirical methods for bioethics: A primer* (pp. 39-62). Emerald Group Publishing Limited.

surveys, interviews, observation records, etc.⁶⁶⁵ Hauch, et al., defined the content analysis as the technique destined to generate, from particular data, reproducible and effective inferences that can be applied to a context.⁶⁶⁶ This technique, according to the mentioned authors, situates the researcher with respect to reality in a triple perspective:

- The data as communicated to the analyst
- The context of the data
- The way in which the knowledge of the analyst forces to divide the reality

The "content analysis" is constructed, as a systematic technique and an objective qualitative that allows representative materials, patent by the all-inclusiveness and possibilities of generalisation.⁶⁶⁷ We can generally positioned that content analysis has become a special scientific technique to run inferences from data fundamentally symbolic, verbal or communicative.⁶⁶⁸ Content analysis, going by its commitment to sociological, psychological issues and practical policies in the last eighty years have improved exponentially by using this technique and has required to establish suitable soundness principles.⁶⁶⁹

Content analysis involves the coding and classification of data,⁶⁷⁰ this analysis is also known as categorisation and its objective is to give meaning to the data collected and highlight messages, features or discoveries that are important.⁶⁷¹ Its focus is to analyse both the explicit content and the manifest of a text, as well as to analyse the latent meaning of the written, which is probably interpolated in the text.⁶⁷² The emphasis of content analysis is the coding of data, which may explain a great limitation

⁶⁶⁵ Elo, S. and Kyngäs, H., 2008. The qualitative content analysis process. *Journal of advanced nursing*, 62(1), pp.107-115.

⁶⁶⁶ Hauch, V., Sporer, S.L., Masip, J. and Blandón-Gitlin, I., 2017. Can credibility criteria be assessed reliably? A meta-analysis of criteria-based content analysis.

⁶⁶⁷ Ibid.

⁶⁶⁸ Kohlbacher, F., 2006, January. The use of qualitative content analysis in case study research. In *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research* (Vol. 7, No. 1).

⁶⁶⁹ Ibid.

⁶⁷⁰ Neuendorf, K.A., 2016. *The content analysis guidebook*. Sage.

⁶⁷¹ Miles, M.B. and Huberman, A.M., 1994. *Qualitative data analysis: An expanded sourcebook*. sage.

⁶⁷² Stemler, S., 2001. An overview of content analysis. *Practical assessment, research & evaluation*, 7(17), pp.137-146.

of this method of analysis: its inability to provide a rich understanding of the meanings of the texts.⁶⁷³

It is performing a reading surface material (sometimes only leafing through, organise, control) and carry out an initial approach to the indicators that research support.⁶⁷⁴ It will mean a preparation of the author himself against selected material. Generally, this first stage has three missions: the choice of documents to be subjected to analysis, formulating hypotheses and objectives, development of indicators that support the interpretation terminal.⁶⁷⁵ These three activities are not necessarily in chronological order, the choice of documents depends on the objectives, or conversely, indicators will be built according hypotheses or, on the contrary, the hypothesis will be based on the presence of certain indications.⁶⁷⁶

The analysis addresses the organisation, but it is composed of activities not structured but "open" as opposed to the systematic exploitation of documents.⁶⁷⁷ Development of coding categories consists of a classification process data about ideas, themes and concepts that will emerge from reading and identifying emerging categories is a process related not only to material analysis but with the formation and the frame theoretical research.⁶⁷⁸

Coding corresponds to a transformation carried out according to rules of raw text data. Transformation by decomposition, aggregation and allows enumeration result in a representation of the content or expression, susceptible to illustrate the analyst text features which can serve as indices or "coding as the process by which raw data are systematically processed and added into units that allow precise description of the relevant characteristics of content".⁷²⁵ The organisation comprises three sections coding, if an analysis quantitative and categorical: the decomposition (choice of units),

⁶⁷³ Ibid.

⁶⁷⁴ Vaismoradi, M., Turunen, H. and Bondas, T., 2013. Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. 15(3), pp.398-405.

⁶⁷⁵ Miles, M.B. and Huberman, A.M., 1994. Qualitative data analysis: An expanded sourcebook. sage.

⁶⁷⁶ Ibid.

⁶⁷⁷ White, M.D. and Marsh, E.E., 2006. Content analysis: A flexible methodology. Library trends, 55(1), pp.22-45.

⁶⁷⁸ Forman, J. and Damschroder, L., 2007. Qualitative content analysis. In Empirical methods for bioethics: A primer Emerald Group Publishing Limited. pp. 39-62. ⁷²⁵

Neuman, W.L., 2016. Understanding research. Pearson.

the enumeration (choice of counting rules) and classification (choice of categories).⁶⁷⁹ The basic features to fulfil their function of elements classification and organisation of information are:

- The mutex not always possible (sometimes the same data can belong to more than one category and as such should be considered).
- The homogeneity.
- The relevance (Adaptation to the intentions of the search).
- Productivity (possibility of providing indices inference).

The fundamental issue to be resolved at this point will be to text elements. It must be taken into account and how to break it down into finite elements. Choosing registration units and context must respond in an appropriate manner.

5.5.3.1 The Recording Unit

The unit of significance to be encoded corresponds to segment content need be considered as unit basis with a view to categorising and counting frequency.⁶⁸⁰ The recording unit it can be highly variable nature and size. A certain ambiguity reigns regarding the criteria for distinguishing registration units.⁶⁸¹ Indeed, certain limitations are at the semantic level, for example the "theme", while others apparently make linguistic level, for example, the "word" or "phrase".⁶⁸² The decomposition approach in the analysis of semantic content is always order if there is sometimes a correspondence with the formal units (examples: word and topic word, phrase and significant unit).⁶⁸³

5.5.3.2 The Context Unit

This unit serves understanding for encoding unit registry. It corresponds to message segment whose size (above the unit registration) is optimal to capture the exact

⁶⁷⁹ Wilson, V., 2016. Research methods: Content analysis. Evidence Based Library and Information Practice, 11(1 (S)), pp.41-43.

⁶⁸⁰ Elo, S. and Kyngäs, H., 2008. The qualitative content analysis process. Journal of advanced nursing, 62(1), pp.107-115.

⁶⁸¹ Ibid.

⁶⁸² Braun, V. and Clarke, V., 2006. Using thematic analysis in psychology. Qualitative research in psychology, 3(2), pp.77-101.

⁶⁸³ Ibid.

significance of the recording unit.⁶⁸⁴ This may be the phrase for the word paragraph to the subject. In determining the size of the governing context unit two criteria: the cost and relevance are significant. Clearly a broad context unit requires a reinterpretation more medium long. Moreover, there is an optimal level of meaning: if it is too small or too large, the context unit no longer fits and then are determining the type of material and the theoretical framework. In any case, it is possible to test registration units and context with small samples in order to have security they are operating with the most appropriate instruments.

5.5.3.3 Development of Typologies and Central Categories

The catalogued of data collected, will be used to carry out a process of systematic comparison of the categories in which they have been integrated. Thus, we can establish relationships that will foster to start the process of understanding them. From here arise categories plants agglutinate categories second order and facilitate the interpretation around certain axes content.

5.5.3.4 Coding

It refers to the assignment of a symbol or code, to each of the categories.⁶⁸⁵ In Hauch et al., authors suggested coding for analysing qualitative information (documents) is a method classification of the information that has three key features.

- a. A set of two or more categories to study a phenomenon so that it is significant for the problem to be solved. In other words, a system of categories that is already been presented.
- b. A set of rules or standards to assign to the phenomena studied different categories. That is, the operational definition of the categories to assign unambiguously codes to the registration units identified in the material written.
- c. The last feature of coding refers to the codes. These will be effective in measures that are representing exclusive categories and rules serve to assign consistently and unambiguously.

⁶⁸⁴ White, M.D. and Marsh, E.E: supra note 696, pp 22-59.

⁶⁸⁵ Leung, L., 2015. Validity, reliability, and generalizability in qualitative research. *Journal of family medicine and primary care*, 4(3), p.324.

5.6 Summary

The central objective of this study is management of port waste through the instrumentality of the legal framework, and the use of the qualitative approach as the basis from which to develop and expand existing knowledge. Open-ended questions via interviews mainly allow the researcher to have understanding of views, attitude, and behaviour of people towards the research topic. It develops knowledge on their experiences, in order to identify significant data that is not possible via quantitative data collection where questions appear with pre-defined options.

This research interview provided insights into the whole process of legal regulation of port management from a number of perspectives. For instance, in the course of the discussion, port management and ship-owners representatives were able to describe the degree to which waste management and disposal at the port affect maritime industry. All of these became evident when the respondents were describing their experience and providing examples of the cases that they have been involved in with regards to port policy on waste disposal with the researcher.

The next chapter, data analysis and interpretation provide a detail analysis of the data collected through interviews carried out by the researcher in this study. The justification for the qualitative research approach was examined in the current chapter to provide clarifications relevant to the multifaceted activities to be performed in the next chapter. The process of conducting interviews in this study emphasis on the rich, practical context to understand the phenomenon of waste generation, how it occurs and can be prevented. Therefore, the next chapter serves the purpose and analysed the data gathered through interviews and review of relevant studies in order to compare and contrast the waste management on the ports of the UK and Nigeria.

CHAPTER 6

DATA ANALYSIS AND DISCUSSION

6.1 Introduction

This chapter analyses the data obtained from interviews into three categories with a view to achieving the research objectives. The first is the existing legal regulations on port waste management and the gaps to address the issue. The second is to analyse the impact of unmanaged waste on the health and safety, community, and business. Third is to analyse the effective port waste management system in both ports. The purpose of using qualitative data via secondary and primary sources is to ensure that the concerns relevant to port waste management are studied in depth; thus, to propose suitable recommendations for the future implications.

Table 6.1: Sample of response to the interview showing the composting similarity and difference in the UK and Nigeria on port waste management. The below table only demonstrates core questions answered during the interviews and computed manually by the researcher based on data generated.

The results of the interviews are attached as appendix 3 for more details.

Coding the level of responses generated from the interview in the following manner;

Poor 1 Good 2 Very good 3 Excellent 4 Indifference 5

Names (Anonymous) Southampton Respondents	Role of respondents	Legal Regulation of port waste, efficacy& implementation in the UK and Nigeria ports	The impact of unmanaged waste on the health and safety, community, and business	The effective port waste management system in both ports.	Similarities /UK and Nigeria Ports	Difference e/UK and Nigeria Ports
SR 1	Port Managers	4	3	3	N/A	50%

SR 2	Southampton port staff	4	3	3	N/A	50%
SR 3	Representative of ship-owner	3	3	3	N/A	40%
SR 4	Viola Environmental Services Plc	4	3	3	N/A	50%
SR5	Terminal Control director	4	4	4	N/A	70%
Apapa Port (Anonymous) Respondents						
AR 1	Port Managers	3	3	3		30%
AR 2	Nigerian Port Authority Staff	3	2	3		20%
AR 3	Nigerian Shippers Council	2	2	2	N/A	20%
AR 4	Nigeria Waste Management Authority	2	2	2	N/A	20%
AR 5	African Circle Pollution Management Limited	3	3	2	N/A	30%

AR 6	National Inland Waterways Authority	2	2	2	–	20%
AR 7	Maritime Workers Union of Nigeria	2	2	2	–	20%
AR8	NIMASA Representative	3	3	3	–	30%

Inadequate management of waste can contaminate the environment, bringing significant impacts to a large group of people. In fact, poor waste management can act negatively on community's health. It is important to know that if waste is well allocated and managed, it can contribute to the preservation of the environment, thus reduce social and environmental impacts and public health risks. Environmental effect is any change in the chemical, physical and biological properties of the port environment triggered by any form of factor due to human activities that directly or indirectly affect the port functionality. It includes: care and well-being of the populace; economic and social programmes; the biota; the quality and excellent conditions of the environmental resources.⁶⁸⁶

A detailed analysis of the port systems is essential to examine their activities, including the cargo handling aspects that occur on the dockside and in the vicinity. The processes also involve environmental consequences, and these consequences often go beyond the legal limits of these ports.⁷³⁴ Expansion projects in port facilities cause changes in the coastal dynamics, which may induce changes in the coastline, suppression of marine or coastal ecosystems, alterations in the landscape, and the impairment of environmental resources for other uses such as tourism, fishing and

⁶⁸⁶ Roberts, O.I. and Okereke, C.I., 2017. Cultural beliefs on waste and the need for integration into present domestic waste management: Evidence from selected communities in Rives state, Nigeria. *International Journal of Social Science & Management Research*, 3(6), pp.1-12. ⁷³⁴ Gray, T.S. ed., 2016. *UK Environmental Policy in the 1990s*. Springer.

local transport.⁶⁸⁷ Therefore, this study analyses the Port Waste Management of the UK and Nigeria with the help of significant literature and interview.

6.2 Existing Legal Regulations of Port Waste Management

Legal regulation in the field of waste management is aimed at preventing the harmful impact of production and consumption wastes on human health and the environment, as well as the involvement of such wastes in economic circulation as additional sources of raw materials. In the UK, it is carried out in accordance with the “Ship’s Waste Management Plan 2017”.⁶⁸⁸ The main principles of state policy in the UK Port Waste Management Plan 2017 are protection of human health,⁶⁸⁹ maintenance or restoration of a favourable state of the environment and conservation of biological diversity.

Effective Port Waste Management is implicit to achieve scientifically grounded combination of ecological and economic interests of a society for maintenance of a sustainable development of a society.⁶⁹⁰ Thus, the use of the latest scientific and technical achievements for the implementation of low-waste and non-waste technologies is ensured.⁷³⁹

According to one of the Nigerian interviewees, the Nigerian regulations have helped to improve and reposition waste management at the port. The regulations cover the international legal framework, regional and national regulation, all the regulations are very important to the administration of port waste management. The commercial

⁶⁸⁷ Jack, M.W., Coles, A.M. and Piterou, A., 2017. Sustainable Project Management In Urban Development Projects: A Case Study Of The Greater Port Harcourt City Development Project In Rivers State, Nigeria. WIT Transactions on Ecology and the Environment, 210, pp.209-219.

⁶⁸⁸ Ship’s Waste Management Plan (2016). Retrieved from <http://www.abports.co.uk/admin/content/files/Marine/lpswich/PWMP2017.pdf>

⁶⁸⁹ Waste Legislation (2017). Retrieved from <https://oilandgasukenvironmentallegislation.co.uk/legislation-index/waste-legislation.htm> (Assessed in March 2018).

⁶⁹⁰ Ibid.

⁷³⁹ Hilson, G., 2003. Defining “cleaner production” and “pollution prevention” in the mining context. Minerals Engineering, 16(4), pp.305-321.

entities and companies have access to information in the field of waste management in accordance with the Waste Legislation.⁶⁹¹

Similarly, the interviewee from the Southampton Port explained the effectiveness of the current legal regulations and how they have improved the awareness among various stakeholders. The interviewee was satisfied with the integration of port waste management activities; however, he thought it to be a challenge to trim down the regulations for quick waste delivery.

Another interviewee from Nigeria explained, the plan that promotes the use of methods for economic regulation of activities in the field of waste management to reduce the amount of waste and involve them in economic circulation is effective. The interviewee commented that there is a need for more changes to meet the quality expected from the ship's owners. Therefore, the owner of hazardous waste might alienate their ownership to another person or organisation. It means they can transfer to him (remaining the owner) the right to own, use or dispose of them if that person has a license to carry out activities in the field of hazardous waste management.⁶⁹² On contrary to this view, the UK participant highlighted a high level of effectiveness of the legal instruments and mutual collaboration of various stakeholders to seek one-stop shop quick solution for the waste management.

According to Soltani et al., a person who owns or uses a land plot, a water body or other facility where there are wastes left by the owner, can turn them into his property, proceeding to use them or by other lawful means.⁶⁹³ The Nigerian interviewees argue that the powers of authorities in the field of waste management are divided between the subjects. According to the interviewees, the port authority only sets out policy in agreement with existing laws on port waste management, however there is a company called African Circle Pollution Management that has gone into Public Private Partnership (PPP) for waste evacuation. In fact, this company is responsible for the management of port waste within West African countries. The interviewee contends

⁶⁹¹ Hilson, G., 2003. Defining "cleaner production" and "pollution prevention" in the mining context. *Minerals Engineering*, 16(4), pp.305-321.; supra note 706, pp. 1-45.

⁶⁹² Blackman Jr, W.C., 2016. *Basic hazardous waste management*. Crc Press.

⁶⁹³ Soltani, A., Hewage, K., Reza, B. and Sadiq, R., 2015. Multiple stakeholders in multi-criteria decisionmaking in the context of municipal solid waste management: a review. *Waste Management*, 35, pp.318328.

that the law has brought necessary changes to port waste management, but the port authority still has work to do, particularly to further enhance the workability and implementation of the law. Thus, integration of state standards, rules, and regulations ensures for safe handling of the wastes and waste disposal facilities.⁶⁹⁴ This is achieved through;

- The organisation and implementation of state control and supervision over activities in the field of waste management;
- The carrying out measures for the prevention and liquidation of emergency situations.

The UK interviewee emphasised that there should be more opportunities for adequate surveillance within the port which can be more accommodated within the port, as well as the terminal operators should also cooperate for quick evacuation with the license waste collector agency. According to the interviewee, this would be more effective as waste is collected from the terminal via machine provided by the operators and subsequently evacuated by the agents from the terminal point. According to the interviewee, the Nigerian Maritime Administration and Safety Agency Act 2007, Merchant Shipping Act 2007 and Coastal and Inland Shipping (Cabotage) Act 2003 are the laws operating at the Nigerian ports. The interviewee notes that the laws have been very helpful at making sure that port waste is properly managed. The adequate implementation of the laws has helped to reduce waste at the port. The laws captured the need of the port as far as waste is concerned. Amasuomo and Baird (2016) proposed a number of reforms of the current system of Nigerian regulation of the waste management sphere.⁶⁹⁵ The principal changes by Amasuomo and Baird (2016) include the following:

- The main powers in the field of waste management of production and consumption are transferred from the municipal level to the federal one.
- A programme-targeted method of planning and financing activities in the sphere under consideration (federal programs of the subjects of the

⁶⁹⁴ Ibid.

⁶⁹⁵ Amasuomo, E. and Baird, J., 2016. Solid Waste Management Trends in Nigeria. *Journal of Management and Sustainability*, 6(4), p.35.

Nigeria, investment programmes of operators in the field of waste management) is being introduced.

As per Nigerian interviewee, the laws need to be enhanced according to the domestic and the international conventions Nigeria is signatory to with a view to giving efficacy to the international regulations. Thus, waste offender could be brought to justice within the parameter of the legal regulations via port policy. This reflects data on the sources of waste generation in the territory of the Nigeria, the amount of waste generated, targets for neutralisation, utilisation and disposal of waste.⁶⁹⁶ In order to organise and carry out these activities for collection, transportation, processing, utilisation, neutralisation and disposal of waste, such a regulation tool is adopted as a territorial scheme in the field of waste management.

On the contrary, at the Southampton port, there is a robust policy established between the port authority and licensed waste collector agents to ensure quick waste collection and clean environment and thus, there is no obvious impact of the wastes. According to the interviewee, the only challenge is the communication when ships want to discharge waste, which is necessary to avoid delays wasting disposal. The interviewee commented that the law adequately implemented and religiously followed will help reducing the port wastes completely.

The legal status of entities engaged in collecting, transporting, processing, disposing, neutralising, disposing of solid municipal waste, including those rendering services to the population, is identified in the Law and operators and federal operators in the field of waste management.⁶⁹⁷ Thus, this establishes the "principle of producer responsibility". An environmental fee is introduced for those producers, importers of goods that do not provide for the independent utilisation of waste from the use of goods. Funds from the payment of environmental charges were proposed to be used to finance the activities of federal programmes in the field of waste management and territorial schemes for waste management.

⁶⁹⁶ Ibid.

⁶⁹⁷ Ghiani, G., Manni, A., Manni, E. and Toraldo, M., 2014. The impact of an efficient collection sites location on the zoning phase in municipal solid waste management. *Waste management*, 34(11), pp.1949-1956.

According to the Apapa interviewee, several measures for the economic stimulation of activities in the field of waste management are being established, which include separately regulated activities in the field of seaport waste management. Without claiming to be an exhaustive analysis of these innovations (their evaluation is yet to be given to scientists and practitioners), within the framework of the negative impact on the environment when disposing off waste.⁶⁹⁸

Interviewees concluded that contracts with organisations involved in the collection and transportation of waste own landfills for further disposal of waste. The Nigerian Waste Management Law provides that tariffs must compensate for economically justified expenses for the implementation of the operator's production and investment programs.⁶⁹⁹ Thus, the costs of collecting, transporting and disposing of waste on the basis of concluded contracts are currently included in the payment for the maintenance and repair of living quarters for the tenants. It ensures an economically justified level of profitability of current activity and used invested capital. According to the interviewee, there is no guarantee of their use for environmental purposes.

The problems lie with the ship owners, according to the observation of the UK interviewee, because the port seems to have provided adequate facilities to handle all manner of waste from ship. Nevertheless, the Maritime Coastguard Agency (MCA) needs to check ship to ensure waste delivery. Also, waste delivery signs should be more obvious for easy locations. In view of this standardisation of actions, the Organisation of European Ports has identified, since 1996, the ten environmental priorities for European ports, based on geography and port dimension.⁷⁰⁰ This tool has allowed us to see how these two characteristics qualitatively condition different environmental challenges; and, based on this, support specific management actions based on each characteristic. From this, it has been possible to show, for example,

⁶⁹⁸ Ibid.

⁶⁹⁹ Babayemi, J.O., Ogundiran, M.B. and Osibanjo, O., 2017. Current Levels and Management of Solid Wastes in Nigeria. *Environmental Quality Management*, 26(3), pp.29-53.

⁷⁰⁰ ESPO. Retrieved from

https://www.espo.be/media/espopublications/espo_green%20guide_october%202012_final.pdf

⁷⁵⁰ Lopes, C., Antelo, L.T., Franco-Uría, A., Alonso, A.A. and Pérez-Martín, R., 2015. Valorisation of fish by-products against waste management treatments—Comparison of environmental impacts. *Waste management*, 46, pp.103-112.

that ports located in estuaries tend to face charges related to dredging, both with respect to operations and the disposal of sediments.

On the other hand, these types of ports face lesser problems related to air contamination, water quality and local community relations.⁷⁵⁰ Thus, the method of identification and analysis of these elements, with potential to be applied in any port context, allows management practices with a deep and systemic base according to each context; an integrative tool, but that part of the premise of individuality of each port system.

In view of the foregoing, we propose to exclude solid municipal waste generated as a result of the vital activity of the population from the objects of taxation to negative impact on the environment. This will not only reduce the economic burden on the population somewhat, but also eliminate the doubts of the executive and judicial authorities regarding the issue of determining the payer.

In order to eliminate the legal gap, optimise and create transparent regulation in the field of port waste prevention and response, it is proposed to establish a notification procedure for the approval of a plan for the prevention of waste disposal.⁷⁰¹ It also provides for administrative liability of offences related to the failure to comply with the requirements of prevention and liquidation of waste from oil products spills; such as, if they fail to submit or submission of knowingly unreliable information on measures to prevent and eliminate oil and oil spills.⁷⁰² It prescribed term for the orders of the federal bodies exercising state, supervising the elimination of violations of the law.

In the perspective of UK interviewee, generally, the legal regulations have set out the need for provision to adequately facilitate the waste generated from the port in any category. The port has been proactive to render good services to some ship owners such that we often use the facilities in line with legal regulations. It is possible to simulate the variation of the values of the control variables, in a positive or negative sense, prior to their execution and to know the impact of that decision on each one of the defined interest groups. This tool to support management aims to provide an

⁷⁰¹ Ibid.

⁷⁰² Davarzani, H., Fahimnia, B., Bell, M. and Sarkis, J., 2016. Greening ports and maritime logistics: A review. *Transportation Research Part D: Transport and Environment*, 48, pp.473-487.

element of innovative assessment when assessing the effects of change decisions and knowing, taking into account the intense fieldwork carried out with groups of experts and prominent figures within the stakeholders.⁷⁰³

In view of the UK interviewee, there are three companies managing waste at the port, while the port only serves as link between the ship owners and the companies for coherent arrangement for quick waste delivery. The Nigerian interviewee highlighted, if all parties come together (policy, society, ecosystem) the management of port waste will be more effective. In addition, it should be considered that population growth is on the rise and by extension, the higher the population the more difficult the waste management becomes.

6.3 Impact of Unmanaged Waste on Community and Business

Port operations are considered as strategic and indispensable activities for economic and social development that are not exempted from environmental implications.⁷⁰⁴ In this way, the environmentally sound development of port has become imperative in all degrees. Society, actors and customers see this development as a necessity for the acceptance of ports on an economic scale.⁷⁰⁵ In this sense, environmental legislation has increasingly required port managers to act in an environmentally more appropriate way, since the practice has shown that this posture can also become an important commercial reason.⁷⁰⁶ According to the Nigerian interviewee, the port has developed some steps at making sure waste disposal is given adequate attention and quick delivery in-line with what is practicable in other developed country. Some of the steps, as stated in the interviewee it includes to note the types of waste to be delivered and quantity of such waste, etc.

⁷⁰³ Puig, M., Wooldridge, C. and Darbra, R.M., 2014. Identification and selection of environmental performance indicators for sustainable port development. *Marine pollution bulletin*, 81(1), pp.124-130.

⁷⁰⁴ Yapicioglu, B., Mogbo, O.N. and Yitmen, I., 2017. Innovative Strategies for Transport Policies in Infrastructure Development: Nigerian Stakeholders' Perspective. *International Journal of Civil Engineering*, 15(5), pp.747-761.

⁷⁰⁵ Adams, M., Quinonez, P., Pallis, A.A. and Wakeman, T., 2009. Environmental issues in port competitiveness. Dalhousie University.

⁷⁰⁶ Puig, M., Wooldridge, C., Michail, A. and Darbra, R.M., 2015. Current status and trends of the environmental performance in European ports. *Environmental Science & Policy*, 48, pp.57-66.

Similarly, the UK interviewee reported that port waste and its impact at the Southampton port has greatly been reduced and more handled professionally. Since, commonly linked to port activities is the oil industry, which, through the installation and operation of platforms and pipelines, directly interferes with the environmental quality of the coastal zone.⁷⁰⁷ Thus, influencing the growth of cities and interfering with the socio-economic activities of local populations. Dredging for maintenance of navigation draft and docking/ unloading manoeuvres also figure as other activities at the port sector that result in environmental impacts, causing changes in the hydrodynamics and the sedimentary balance of the environment.⁷⁰⁸

This scenario may be aggravated by inadequate land use along the drainage basin that flows into the shipping channels of the ports. Consequently, this may imply an increase in the demand for maintenance dredging. The presence of underutilised facilities, on the other hand, also means unnecessary consumption of the environment, implying the waste of natural and financial resources.⁷⁰⁹ Therefore, in general, environmental impacts should be systematised based on all aspects, taking into account the environmental and social components that exist in the local context.⁷¹⁰ In this context the UK interviewee said that waste has been reduced to the barest minimum at the port, and as such impact of unmanaged waste cannot be felt or seems to be obvious.

Nigerian interviewee suggested, management no longer focuses solely on the operational aspects of the port services offered and begins to take into account its environmental performance. Along with this, regularisation of port activity with competent environmental agencies can lead to prevention and mitigation of impacts, as well as the recovery of degraded environments.⁷¹¹ The identification and compilation of these factors is the first step in the decision-making process, in the

⁷⁰⁷ Baird*, A.J., 2004. Public goods and the public financing of major European seaports. *Maritime Policy & Management*, 31(4), pp.375-391.

⁷⁰⁸ Pallis, A.A., Vitsounis, T.K. and De Langen, P.W., 2010. Port economics, policy and management: Review of an emerging research field. *Transport Reviews*, 30(1), pp.115-161.

⁷⁰⁹ Asgari, N., Hassani, A., Jones, D. and Nguye, H.H., 2015. Sustainability ranking of the UK major ports: methodology and case study. *Transportation research part E: logistics and transportation review*, 78, pp.19-39.

⁷¹⁰ Ibid.

⁷¹¹ Pallis, A.A., Vitsounis, T.K. and De Langen, P.W., supra note 731, pp, 115-180. ⁷⁶² Ibid.

search for an efficient and effective environmental control, and such a foundation can support the implementation of technical instruments in the environmental suitability of port systems. In the possession of adequate information, managers can then define measures that aim at correcting eventual operational and structural failures that may provide converge to environmental impacts on their sites.⁷⁶²

Reconciling transport activity with effective public health emergency control of passenger and cargo flows is another major challenge facing the global port sector today.⁷¹² But in general, faced with the challenge of promoting the development of port activity in harmony with the environment, it must be possessed of logic of planning and implementation of its structures. This contains, in an effective way, parameters of adjustments to the aspects with environmental protection and management.⁷¹³ In this sense, several actions have been developed globally in order to reconcile port logistics with the preservation of the environment, whose proposals have been contemplated in several areas.

Blackman argued that the port activity can generate environmental impacts resulting from the implementation of a port structure, loading and unloading operations and increasing the flow of vessels in a coastal area. Among the aspects that cause impacts related to the port activity, are the construction of port works (maritime and terrestrial), the operations of transfer of products, the operation of machinery, equipment and port vehicles, waste, effluents and ballast water of vessels, ancillary services, such as the supply of vessels, among others. As for the possible impacts, Soltani, Hewage, Reza, and Sadiq divided between impacts from the port's implementation (alteration of hydrological patterns, geomorphology and coastal landscape, habitat suppression, among others) and impacts from port operations (changes in water quality, atmospheric and noise pollution, disturbances in fauna and flora, introduction of exotic species, proliferation of vectors of diseases, among others).

Given the increase in maritime traffic, and considering that port terminals are located predominantly along sensitive coastal environments, in the last decades there has been a sophistication of environmental management instruments specific to port

⁷¹² Lam, J.S.L. and Notteboom, T., 2014. The greening of ports: a comparison of port management tools used by leading ports in Asia and Europe. *Transport Reviews*, 34(2), pp.169-189.

⁷¹³ Ibid.

areas.⁷¹⁴ These instruments are constituted basically by the environmental compliances established by the legislation in force.⁷¹⁵ In this way, the environmental management of port has been improve, whose main objective is to reconcile the expansion of the port structure with actions of prevention, control, monitoring and environmental restoration, essential for the preservation of the environment and natural resources of the country.⁷¹⁶

According to the Nigerian interviewee, relationship between port and environment covers a wide range of issues, from the role of the port in the search for sustainable development to the individual treatment of impacts by the activities produced in it. According to Davarzani, Fahimnia, Bell, and Sarkis, the environmental components affecting the community and people are classified as: air quality, water and bottom column conditions, noise and vibrations, odour, topography, hydrology and oceanology, aquatic and terrestrial fauna and flora, landscape, residues, socio-cultural aspects and socioeconomic aspects.⁷¹⁷

The waste management activities come to port through a series of international protocols, agreements and conventions, which internally induced a considerable number of regulation instruments.⁷¹⁸ This modulates the activity according to environmental standards of preservation, conservation and recovery.⁷¹⁹ The successful handling of waste at port areas depends on the correct ordering of actions in managing wastes, and should end with the implementation of appropriate waste management practices.⁷²⁰ This requires that the establishment of an environmental policy for ports, the recognition of environmental interfaces, compliance with environmental legislation, internalisation of management instruments, training of

⁷¹⁴ Notteboom*, T.E. and Rodrigue, J.P., 2005. Port regionalization: towards a new phase in port development. *Maritime Policy & Management*, 32(3), pp.297-313.

⁷¹⁵ Ibid.

⁷¹⁶ Parola, F., Notteboom, T., Satta, G. and Rodrigue, J.P., 2013. Analysis of factors underlying foreign entry strategies of terminal operators in container ports. *Journal of Transport Geography*, 33, pp.72-84.

⁷¹⁷ Fahimnia, B., Bell, M.G., Hensher, D.A. and Sarkis, J. eds., 2015. *Green logistics and transportation: A sustainable supply chain perspective* (Vol. 4). Springer.

⁷¹⁸ Ibid.

⁷¹⁹ Pereira, M.G., *The Environmental Licensing of Ports And Dredging Activities In The Coastal And Marine Zones In Brazil As An Instrument For The Implementation Of International Legal Regime*.

⁷²⁰ Ibid.

personnel and structuring of management, and operation teams for the correct application of these instruments, and the study of environmental costs related to the port.⁷²¹

The UK interviewee affirmed that the port has great awareness toward its responsibility as far as legal regulations on waste are concerned at the port. Thus, once the environmental aspects and impacts have been identified, it is indicated that plans of control and monitoring actions are developed so that the identified environmental risks are at the maximum controlled and their potential effects are minimised.⁷²² Environmental Impacts are defined in the same standard as any adverse or beneficial environmental changes that result, in whole or in part, from the environmental aspects of the organisation.⁷²³ That is, environmental aspect is the cause and environmental impact is the effect.

Blackman, considers environmental impact to be any transformation in the biological growth, chemical and physical changes caused due to environmental changes in most formation in human psychology by any form of energy activities or exercise.⁷²⁴ Soltani, et al., asserted that directly or indirectly disturb the safety, health and well-being of the people, their economic and social activities, the quality of excellent of the environment; and that of environmental resources.⁷²⁵ Thus, what characterises an environmental impact is not any modification in the properties of the environment, but changes that cause the unbalance of constitutive relations of the environment, such as those that exceed the absorption capacity of pollutants in the environment considered.⁷²⁶

The environmental and social impacts are the significant effects, negative or positive changes, produced on the environment and the quality of life of the populace, as a

⁷²¹ Craine, L.E., 2017. Water management innovations in England. Routledge.

⁷²² Ibid.

⁷²³ Lun, Y.V., Lai, K.H., Wong, C.W. and Cheng, T.C.E., 2015. Environmental governance mechanisms in shipping firms and their environmental performance. *Transportation Research Part E: Logistics and Transportation Review*, 78, pp.82-92.

⁷²⁴ Ibid.

⁷²⁵ Ibid .

⁷²⁶ Rodrigue, J.P. and Notteboom, T., 2011. Port regionalization: improving port competitiveness by reaching beyond the port perimeter. *Port Technology International*, 52, pp.11-17.

consequence of the development of works or activities.⁷²⁷ The Ministry of Environment and Sustainable Development works to contribute to the preservation and preservation of natural resources and the safety of the quality of life of the populace, promoting the consideration, prevention and adequate management of potential environmental and social impacts that may have the projects of works or activities, as well as the adoption of certain policies, plans or government programs. In this framework, it seeks to strengthen the application of the Environmental Impact Assessment and strategic environmental assessment.⁷²⁸ The two tools that serve to measure the impact of activities on the environment and health include:

- Promote the continuous improvement of the Environmental Impact Assessment (EIA) at the national level.
- Promote the Strategic Environmental Assessment (SEA), in a progressive manner, for the policies, plans and programmes of the different sectors at the national level.

To contribute to the adequate implementation of the General Law of the Environment in relation to the EIA and in particular the EsIA. Contribute to the development of minimum budgets on EIA, EAE and other topics related to the subject and promote its implementation. Update, standardise or elaborate general and sectoral guidelines for the realisation of Environmental Impact Studies (EsIA), Environmental Impact Assessments (EIA) and Strategic Environmental Assessments (EAE) jointly with the corresponding government areas.⁷⁸⁰ To contribute to the strengthening of national and provincial environmental assessment systems, training, information exchange and dissemination of good practices are important. According to interviewees, following are some best practices implemented by the UK Waste Management:

- Establish and manage a national registry of environmental assessment consultants.

⁷²⁷ Din, G.Y. and Cohen, E., 2016. Modeling municipal solid waste management in Africa: case study of Matadi, the Democratic Republic of Congo. *Solid Waste Management: Policy and Planning for a Sustainable Society*, p.81.

⁷²⁸ Puig, M., Wooldridge, C., Casal, J. and Darbra, R.M., 2015. Tool for the identification and assessment of environmental aspects in ports (TEAP). *Ocean & Coastal Management*, 113, pp.8-17. ⁷⁸⁰ Fischer, T.B., Jha-Thakur, U. and Hayes, S., 2015. Environmental impact assessment and strategic environmental assessment research in the UK. *Journal of Environmental Assessment Policy and Management*, 17(01), p.1550016.

- Contribute with information referred to the subject to strengthen environmental statistics.

There is a continuous work of systematisation of the best practices for the Strategic Environmental Assessment, as an environmental management tool that allows the incorporation of the objectives and goals of sustainable development in the decision making on policies, plans or governmental programmes.⁷²⁹ Likewise, UK Waste Management has other lines of action are developed such as:

- Exchanges with national or international organisations and institutions for cooperation on best practices related to EIA and EAE.
- Advice and collaboration on reviews of Environmental Impact Studies with other public administration bodies.
- Preparation and review of regulatory projects that promote the implementation of the EIA and EAE. Permanent update of the inventory of standards referring to EIA and EAE, which can be consulted by entering here.
- Manage and strengthen the Environmental Impact Studies (EIA).

In 2005, the World Health Organisation (WHO)⁷³⁰ established the International Health Regulations (IHR), a basis to be country-specific and made up of various determinations on the basic capabilities of ports (in addition to airports and land border crossings). The Nigerian interviewee suggested that implementation of this regulation is intended not only to assist countries in managing the spread of diseases, but also in the various types of pandemics. However, it involves monitoring different means of transport through agreements between countries, to specify the rights and duties of each State as to their propagation. Another major concern is the elimination of oily discharge from the ballast water of ships. This issue is well recognised internationally and, in order to serve it, adequate port reception facilities for these components, have been sought.

⁷²⁹ Noble, B. and Nwanekezie, K., 2017. Conceptualising strategic environmental assessment: Principles, approaches and research directions. *Environmental Impact Assessment Review*, 62, pp.165-173.

⁷³⁰ Ibid.

Going beyond ballast water, the UK sets rules for the prevention of marine pollution from ships in general (oil and other forms of pollution). In addition to this concern, the UK government seeks to establish cooperation aimed at immediate response systems of accidents through instruments.⁷³¹ These instruments include: Emergency Plans and regulations for pollution prevention caused by several types of substances. In the international port scenario, Roberts and Okereke (2017) corroborated with this assertion that globally, attitudes towards environmental protection were not equal in time or intensity, which is why today we seek a standardisation of these actions.⁷³²

6.4 Effective Port Waste Management

In line with the existing legislation, Nigerian ports can effectively manage the wastes by minimising the risks of unauthorised discharge of waste from ships.⁷³³ According to Agwu and Emeti, development and implementation of technological measures to ensure effective collection and placement of all types of ship wastes, avoidance of forced downtime of vessels in anticipation or non-fulfilment of applications for withdrawal waste.⁷⁸⁶ According to the Nigerian interviewee, for effective port waste management, the strategies are to sort out port waste with a private company for adequate handling. This is devoid of normal government bottleneck which to some extent has eliminated corruption and infused accountability into the system.

Roberts and Okereke, asserted that the organisation of permanent monitoring of shipgenerated waste disposal aimed at maintaining the sufficient technical means of waste removal at the port.⁷³⁴ Din and Cohen, suggested implementation of the state policy aimed at long-term development of and modernisation of receiving port

⁷³¹ Ivshina, I.B., Kuyukina, M.S., Krivoruchko, A.V., Elkin, A.A., Makarov, S.O., Cunningham, C.J., Peshkur, T.A., Atlas, R.M. and Philp, J.C., 2015. Oil spill problems and sustainable response strategies through new technologies. *Environmental Science: Processes & Impacts*, 17(7), pp.1201-1219.

⁷³² Ibid.

⁷³³ Onwuegbuchunam, D.E., Ebe, T.E., Okoroji, L.I. and Essien, A.E., 2017. An Analysis of ShipSource Marine Pollution in Nigeria Seaports. *Journal of Marine Science and Engineering*, 5(3), p.39. ⁷⁸⁶ Agwu, M.O. and Emeti, C.I., 2014. Issues, challenges and prospects of small and medium scale enterprises (SMEs) in Port-Harcourt City, Nigeria. *European Journal of Sustainable Development*, 3(1), p.101.

⁷³⁴ Board, M., 1995. *Clean Ships, Clean Ports, Clean Oceans: Controlling Garbage and Plastic Wastes at Sea*. National Academies Press.

facilities.⁷³⁵ According to interviewee, it can be improved, the laws regulating waste at the Apapa port are alive and dynamic, but the laws needs to be concise and gathered into a single document for effective implementation. The enforcement of environmental laws in Nigeria has been problematic, and it has met with limited success due to this duplicity of the legislations govern port waste management.

UK Waste Management covers monitoring of the movement of all types of ship-generated waste in the port.⁷³⁶ According to the interviewees, Nigerian authorities need to work on calculation and justification of the need for long-term development of foster care weapons. According to interviewee, 'only strategy seems known to me is by given the waste management to a company and sets up agency to oversee the performances of waste management at the port'. This requires the control of the removal and placement of ship-generated waste on the port by a company. Therefore, monitoring, condition and working capacity of technical equipment on receipt, delivery of bilge and sewage from ships is there responsibility.⁷³⁷

The UK interviewee argued that there is plethora of regulations, from international conventions to regional legal directive and of course UK national law. The legal framework or whatever is call would be incorporated into our national law and becomes binding. The UK interviewee further suggested that the only way is to strengthen the monitoring team is to ensure proper surveillance and create awareness on the danger of waste dropping from the ship operators. Awareness conference could be held periodically so that port stakeholders would be able to familiarise themselves with the need to stop dropping waste into the maritime environment. And the proper implementation of the law should be a matter of priority for the port authority.

According to the Nigerian interviewee, fairness to the system, and proper implementations of the laws, create an informed awareness among the port stakeholders to dispose waste in a more conventional way to avoid environmental

⁷³⁵ Ibid.

⁷³⁶

<http://www.southamptonvts.co.uk/admin/content/files/Port%20Master%20Plan%202016/MCA%20Approved%20Version%202016%20Dec.pdf> (Assessed on March 2018).

⁷³⁷ Babaei, A.A., Alavi, N., Goudarzi, G., Teymouri, P., Ahmadi, K. and Rafiee, M., 2015. Household recycling knowledge, attitudes and practices towards solid waste management. Resources, Conservation and Recycling, 102, pp.94-100.

hazard. The control of the movement of ship-generated waste during the design of the parishes is necessary for organisation of systemic interaction of federal bodies on supervision and control over the activities of enterprises carrying out environmental services in the port.⁷³⁸ Conventional ways will include; recycling of the waste, treatment of the waste, and other ways to treat waste coming from industry like port. The Nigerian interviewee further mentioned that the carrying out of environmental surveys to justify the setting of discounts from environmental charges (tariffs) is necessary. It will also help in the investigation of cases of refusals to perform services for the removal of ship's waste. The implementation of the goals and objectives of the plan is achieved on the basis of interaction with the public authorities and control in the field of security environment, economic relations and tariff policy, entities of port activity.

The ship-generated waste management of the UK, in opinion of the interviewees is the "Guidelines for adequacy of port reception facilities for waste", regulates planning and operation of port receiving facilities, their technical and the order of functioning at the level of the necessary sufficiency, port specialisation. The legal regulation provides for optimisation of procedures for access to reception facilities, exclusion of restrictions and unjustifiably high fees for users.⁷³⁹ The UK legislations also reflect the formation of technological conditions for removal and deployment of ship wastes generated during the normal operation of ships. It includes those related to cargo, within the scope of implementation of the International Convention on Prevention of Pollution from Ships.⁷⁴⁰

The Nigerian legislation for waste management is based on the management of production and consumption waste, state regulation of port for the fulfilment of the international obligations and to ensure the adequacy of reception facilities for removal of waste from ships in Ports.⁷⁴¹ The state administration function for managing

⁷³⁸ Nishtala, V., Davis, M.G., Bracken, R.L. and Hine, R.M., CR Bard Inc, 2016. *Waste management system*. U.S. Patent 9,463,110.

⁷³⁹ Tan, S.T., Lee, C.T., Hashim, H., Ho, W.S. and Lim, J.S., 2014. Optimal process network for municipal solid waste management in Iskandar Malaysia. *Journal of Cleaner Production*, 71, pp.48-58.

⁷⁴⁰ Pettit, S.J., 2008. United Kingdom ports policy: changing government attitudes. *Marine Policy*, 32(4), pp.719-727.

⁷⁴¹ Edet, A., 2017. Security Agents in Nigeria Sea Ports: A Focus On Port Harcourt Sea Port. *Global Journal Of Applied, Management And Social Sciences*, 13.

reception systems of waste management on Port is carried out with ineffective compliance to the existing legislation. According to Williams and Hakam, on seaports making amendments to certain legislative acts of the Nigeria is necessary for the appropriate functioning of state supervision of the activities of enterprises.⁷⁴² It includes indications of environmental services to ships, conditions for the maintenance of facilities for accommodation and ship waste is carried out by the competent legislation of the Nigeria.⁷⁴³ Godwin and Oghenekohwiroro, suggested that the activities of enterprises providing environmental services to ships and landfills for the disposal and utilisation of waste from ships are carried out on a commercial basis in the current legislation of the Nigeria.⁷⁴⁴

Butt suggested the UK's legal framework for waste management of ports include: control over ensuring environmental safety; management of measures to prevent pollution of marine areas ports with waste from ships; and organisation of measures to eliminate accidental pollution of the environment with ships.⁷⁴⁵ These practices must be adopted by the Nigerian ports for effective waste management.

The UK's port waste management practices show that training for management waste is the most effective way to protect the effective waste management in ports.⁷⁴⁶ In view of the interviewees, the waste management instruction should be prepared, supported and approved by the Port Authority. The waste management instruction should be sent to interested parties participating in the waste management, and related explanatory activities. A port or terminal must provide requirements of the provisions of the Waste Management Regulations. Butt argued there is a high probability of the need for training for the port personnel to perform the functions in accordance with the

⁷⁴² Williams, J.O. and Hakam, K., 2016. Microorganisms associated with dump sites in Port Harcourt Metropolis, Nigeria. *Journal of Ecology and The Natural Environment*, 8(2), pp.9-12.

⁷⁴³ Barnes-Dabban, H., Van Koppen, K. and Mol, A., 2017. Environmental reform of West and Central Africa ports: the influence of colonial legacies. *Maritime Policy & Management*, 44(5), pp.565-583.

⁷⁴⁴ Onwuegbuchunam, D.E., Ogwude, I.C., Ibe, C.C. and Emenike, G.C., 2017. Framework for Management and Control of Marine Pollution in Nigeria Seaports. *American Journal of Traffic and Transportation Engineering*, 2(5), pp.59-66.

⁷⁴⁵ Butt, N., 2007. The impact of cruise ship generated waste on home ports and ports of call: A study of Southampton. *Marine Policy*, 31(5), pp.591-598.

⁷⁴⁶ Øhlenschläger, J.P., Newman, S. and Farmer, A., 2013. Reducing ship generated marine litter—Recommendations to improve the EU port reception facilities directive. Brussels, IEEP (Institute for European Environmental Policy).

waste management.⁷⁴⁷ Thus, develop the necessary preparatory courses with the support to ports and terminals regarding implementation of their respective activities in accordance with the waste management.

In the light of current waste laws and regulations in the UK, it is concluded that all those responsible for waste management plans who fail to comply with their obligations under the laws may be liable to 1 to 3 years' imprisonment.⁷⁴⁸⁷⁴⁹ The new version of ISO 14001 published at the end of 2015 helps organisations implement a legally correct environmental management system that is appropriate to the company's needs.⁷⁵⁰ To manage waste means to effectively and systematically adopt a set of actions in the stages of collection, transportation, trans-shipment, treatment, final destination and final disposition environmentally adequate. Based on the product life cycle analysis and clean production, waste management is an opportunity to promote the quality of separation and commercialisation of materials, avoid environmental and public health damage, reduce waste and costs and thus increase business profitability, contributing to sustainable development.⁷⁵¹

The elaboration and enhancement of the legal framework on port waste management has many benefits, such as identifying deficiencies, reducing waste through efficient selective collection with the participation of all those involved, to make a profit from the commercialisation of quality recyclable materials.⁷⁵² It contributes to a positive image vice-versa its clients, partners and the local community, as well as ensuring compliance with legal requirements, minimising the risk of fines and punishments.⁷⁵³ The responsibility for waste management is shared between the Public and State, the business sector and the whole community. Both parties are responsible for the waste

⁷⁴⁷ Ibid.

⁷⁴⁸ <https://uk.practicallaw.thomsonreuters.com/6-503->

⁷⁴⁹ [?transitionType=Default&contextData=\(sc.Default\)&firstPage=true&bhcp=1](https://uk.practicallaw.thomsonreuters.com/6-503-?transitionType=Default&contextData=(sc.Default)&firstPage=true&bhcp=1) (Assessed on 8 March 2018).

⁷⁵⁰ Campos, L.M., de Melo Heizen, D.A., Verdinelli, M.A. and Miguel, P.A.C., 2015. Environmental performance indicators: a study on ISO 14001 certified companies. *Journal of Cleaner Production*, 99, pp.286-296.

⁷⁵¹ <https://www.cips.org/Documents/About%20CIPS/Develop%20Waste%20v3%20-%2020.11.07.pdf> (Assessed on 6 March 2018).

⁷⁵² Breitling, U. and Leader, G.T., 2010, August. Sustainable shipping and port development. In 5th Regional EST Forum in Asia.

⁷⁵³ Ibid.

generation⁷⁵⁴. Therefore, as the interviewee suggested, generators should minimise waste generation and promote maximum reuse and recycling and ensure environmentally appropriate final disposal.

Thus, individuals or legal entities are responsible for the implementation and full operationalization of the waste management plan. In addition to losing opportunities, it is an environmental crime to cause pollution or damage to human health, fauna and flora, by the discharge of solid, liquid or gaseous wastes, or debris, oils or substances.⁷⁵⁵ The interviewee argued, whoever "handles, packs, stores, collects, transports, reuses, recycles or disposes of hazardous waste in a way other than that established by law or regulation is subject to a penalty."⁷⁵⁶

Although dredging has been advanced with the inclusion of environmental monitoring in the international forum, this point still represents only one node inserted in the huge network of environmental elements that should be considered by the port administrations.⁷⁵⁷ In addition, it is possible to observe that these three elements do not support strategic actions, but only general concepts focused on environmental port management. In the UK, any economic activity that causes significant impact on the environment must be submitted to independent environmental licensing of other authorisations required by the Environment Protection Act 1970.⁷⁵⁸ In the case of ports, environmental licensing is a legal obligation, prior to the installation of any undertaking in which there is planning of port infrastructure. The competence to authorise and monitor this obligation is shared by the organs of the National

⁷⁵⁴ Dionis, A., Adrián, M.C., González, J.A., Luis, S.R., Padrón, F. and Peña, A., 2017. Implementation and Benefits of Environmental Management System (UNE-en ISO 14001: 2004 Standard) In Shipping Company. *Journal of Maritime Research*, 13(1), pp.79-83.

⁷⁵⁵ Lannelongue, G., Gonzalez-Benito, J., Gonzalez-Benito, O. and Gonzalez-Zapatero, C., 2015. Time compression diseconomies in environmental management: The effect of assimilation on environmental performance. *Journal of environmental management*, 147, pp.203-212.

⁷⁵⁶ Ibid.

⁷⁵⁷ Wooldridge, C. and Stojanovic, T., 2000. 10 Integrated environmental management of ports and harbours. *Shipping and Ports in the Twenty-first Century*, p.191. and <https://www.ing.be/Assets/Documents/Marketing/ING-the-future-of-port-logistics.pdf> (Assessed on 11 March 2018).

⁷⁵⁸ Porter, M.E. and Van der Linde, C., 1995. Toward a new conception of the environmentcompetitiveness relationship. *Journal of economic perspectives*, 9(4), pp.97-118.

Environmental System.⁷⁵⁹ However, compliance with these regulatory frameworks remains problematic due to the lack of awareness, lack of infrastructure, financial resources, technology and trained personnel.⁷⁶⁰

Many of the waste management practices at the ports reflect the internalisation of the international agreements, focused mainly on port security issues.⁷⁶¹ On the other hand, the inadequacy of some national policies is expressed by the fact that the environmental dimension was not considered decisively in the implementation of the recent reforms of the Nigerian port sector. This question becomes essential for port environmental management, since, according to Lee and Ling, the productive system only incorporates new standards if they are in compulsory regulations or laws.⁷⁶² In addition, there is the lack of specific and detailed actions of environmental management. Only minor nuances of obligations to take care of the environment can be very vague requirement when trying to think about the scope of prevention, planning and mitigation of the environmental impacts of port activities. Interviewee suggested, some environmental elements were contemplated, but still in a restricted and synthetic way:

- Issuance by the licensing body of the term of reference for environmental studies with a view to licensing as a requirement for the port facility;
- Environmental monitoring as one of the activities of the National Dredging Programme;
- The competence of the port administration to ensure that activities are carried out with respect to the environment.

A sustainable system for port waste management does not require a subsidy from the public, it only requires a collective action among the port stakeholders against ineffective port waste management.⁷⁶³ According to Southampton port, this

⁷⁵⁹ Mitchell, J.K., 1982. Coastal zone management: a comparative analysis of national programs. *Ocean Yearbook Online*, 3(1), pp.258-319.

⁷⁶⁰ Ibid.

⁷⁶¹ Acciaro, M., Ghiara, H. and Cusano, M.I., 2014. Energy management in seaports: A new role for port authorities. *Energy Policy*, 71, pp.4-12.

⁷⁶² Lee, H.L. and Ling, L.P., 2015. Impact of Implementation of ISO 14001 Environmental Management Systems on Environmental Performance: A Case Study. *Engineering Research Science & Technology*, 4(1), pp.1-13.

⁷⁶³ Mitchell, J.K., 1982. Coastal zone management: a comparative analysis of national programs.

encourages users to carry out recycling practices, a separation of waste at the source and a reduction in waste production, to reduce to the maximum delivery of waste to the cleaning service operator.⁷⁶⁴ Thus, the port authority should be responsible for the implementation and maintenance of a programme to raise awareness of the port wastes that allows separation process of recyclables in the generation sources, increasing the percentages of recycling.⁸¹⁷

Thus, classify and condition them for commercialisation, moving towards a formalisation of the Recycling Programme and its inclusive recycling component relevant to port wastes management. According to Southampton ports, it should also be highlighted that there will be no market or reasonable prices for port waste recycle if there are no industries that can absorb them, generating demand, and, therefore, better prices for the classifiers are available. Thereby, Apapa ports emphasizes it is essential that the government encourage the development of simple technologies that require low investment and reduced operational costs to add value to the recyclables.

6.5 Main Findings and Results

In order to understand the rationale for identifying environmental aspects and environmental impacts of ship-generated waste at the port, it is important to understand the elements of the activities, products or services of an organisation that may interact with the environment, causing or may cause environmental impacts. According to Lun, Lai, Wong, and Cheng, there are materials, products or forms of energies (thermal, nuclear, electric, etc.) and their interactions, dispositions and involvements related to processes, products or activities.⁷⁶⁵ These may result in beneficial or environment, man or facilities, regardless of their temporality (at present, in the past or in the future). Therefore, environmental impacts will be the result of

Ocean Yearbook Online, 3(1), pp.258-319.

⁷⁶⁴ Asgari, N., Hassani, A., Jones, D. and Nguye, H.H., 2015. Sustainability ranking of the UK major ports: methodology and case study. *Transportation research part E: logistics and transportation review*, 78, pp.19-39. ⁸¹⁷ Ibid.

⁷⁶⁵ Wong, C.W., Lai, K.H., Shang, K.C., Lu, C.S. and Leung, T.K.P., 2012. Green operations and the moderating role of environmental management capability of suppliers on manufacturing firm performance. *International Journal of Production Economics*, 140(1), pp.283-294.

products or the actions or omissions of actions by employees or third-party employees who are serving or operating the organisation.⁷⁶⁶

The environmental aspects of an enterprise are fundamental for an adequate environmental management of its activities. Its purpose is to highlight what are the activities and which are the products that have risks of causing environmental accidents. According to interviewee, the authorities need to maintain higher standard of adequate surveillance and monitoring within and around the port, particularly during ship berth would be the means to ensure waste does not flow into port water.

To further understand what the effect of ineffective port waste management is, it is important to improve the present situation of waste handling at the port. For example, in an organised ineffective port waste management may result to port environmental degradation and inaccessible to ship due to oil spillage from ship. To improve the waste management of the Nigerian ports in accordance with the existing Nigerian legislation vis-à-vis the UK port waste management legislation, the following considerations have been highlighted by the participants:

- The UK laws have brought tremendous improvement towards port waste management. The Nigerian laws and regulation on waste management have also achieved significant port wastes reduction with the implementation of laws
- The UK and Nigerian legal regulations need improvements in regard to improve the delay time for the port waste management.
- The general and periodic review of the UK and Nigerian regulations are necessary in line with recent changes and technology involved
- There had not being any reported cases of conflict of the law with regards to implementation of law within the UK.
- The mode of implementation of the UK regulations have already been set out in clear terms in the legal instrument, but if there is any internal policy by the port authority to ensure port waste free must be in agreement with the law.

⁷⁶⁶ Champ, M.A., 2003. Economic and environmental impacts on ports and harbors from the convention to ban harmful marine anti-fouling systems. Marine pollution bulletin, 46(8), pp.935-940.

- The penalties set by the UK law seems enough though to deter waste offender, so the port authority does not need additional enforcement mechanism but to work with the one already provided by the law. However, the Nigerian law needs to address the issue more widely.
- The UK legal regulations are very effective to control waste generation at the port and the only challenge is to provide one-stop solutions.
- Information and communication technologies ought to be used in full potential to ensure there is no delay in the part waste management via communication among the various stakeholders.

6.6 Summary

With the poor management of waste there may be emissions of particulates and other atmospheric pollutants, related to the combustion of the garbage in the open air, or by the incineration of waste without the use of suitable equipment. To reduce the impacts caused by port waste, interviewees recommended the state is responsible to ensure port is free of waste and anyone caught or liable would be prosecuted. At the moment there is no such case, but that does not mean people are in compliance with the law. Nigeria therefore needs to increase the surveillance to ensure the law is implemented effectively.

In order to generate positive results from environmental legislation, proper preparation and implementation of waste management plans should be conducted, as well as monitoring to check or enhance the efficiency of actions. It is important to highlight the problem of waste generation at the port as a common problem, which needs a high participation of the whole stakeholder within the maritime environment. Otherwise, we will continue with the systematic current process, which consists of minimal effort on the part of port authority or on the part of administrations and entities that currently perform task of implementation of the legal regulation of port waste management. However, this problem has not been put aside in its entirety.

The UK has developed methods to quantify the level of waste production at its various ports. Nigeria equally has implemented innovative and effective policies, which have brought benefits for agent handling waste at the Apapa port via Public Private Partnership. New Waste Management Programmes can be created with the purpose

of promoting and supporting the on-going basis of the environmental regularisation of ports and port terminals in Nigeria. In order to reconcile the need for its operation and maintenance the current environmental standards of the UK are sufficient to address the legal requirements of Nigeria's legal framework. However, when considering port waste management and its legal regulation, it is difficult to establish an equivalent direct relationship between port environmental waste regularisation and efficient implementation of the laws.

The literature addressed this problem by stating that port environmental policies represent a reflection of the international challenges that need mutual efforts for implementation.⁷⁶⁷ Thus, considering the incipient Nigerian national port policies implementation regarding waste management, the case study of this study has been adequately contextualised.

It is recommended by the interviewees that new strategies for the development of more effective legal framework for port waste management in Nigeria should be developed in consultation with the UK's waste management legislation and practices.

In practice, Nigerian waste management is still below the ideal in environmental terms that require a basis for governance processes to improve at the national level. Interviewees suggested an adequate implementation of the law to ensure there is no lapses at the implementation.

The purpose of this study was to analyse the port waste management in the UK and Nigeria. Therefore, as it was possible to show significant differences in the regulatory frameworks and practices of the two countries. There are still unresolved issues and in disagreement with the existing port model. These indicators are poorly considered in the Nigeria's scenario, hindering the desired and necessary standard for the efficient port waste management capable of guaranteeing the sector's sustainability and quality. In view of the above, the next chapter succinctly captured the research summary, its contributions to knowledge and conclusion.

⁷⁶⁷ Ibid.

CHAPTER 7

RECOMMENDATIONS, CONTRIBUTIONS AND CONCLUSION

7.1 Introduction

A natural right is a right that every person enjoys by association with the rest of society, and which is protected and guaranteed by the government.⁷⁶⁸ This right is inalienable, like those rights which nature endows each person with by birth. One of these rights is the right to a decent and unpolluted environment. Hence, efforts must be made to ensure stringent measures are established to address the incessant waste at the port environment with a view to ensure decent environment at the port in accordance with the extent laws.⁷⁶⁹ Therefore, this chapter will recommend workable solutions to ineffective port waste management, and the improvement of the port environment respectively.

The research has genuinely recognised the impacts of legal regulations on ship-generated waste to curb disposal of wastes have increasingly become an important research topic, and this has become more obvious in view of the challenges often posed by waste at the port. Waste due to shipping activities in port is bound to increase as long as human growth continues to escalate and new machineries are developed to be used at the port.⁷⁷⁰ Although, a comparison between Southampton, a leading port in the United Kingdom, and Apapa Port in Lagos, South-West Nigeria, might seem implausible, the efforts have been rewarding, as shown in the findings.⁷⁷¹ To curb ineffective waste management at the port, a number of approaches have been pointed out in the research.

As earlier argued, legal regulations and port waste management framework addressing port waste are available and most nations and regions government have

⁷⁶⁸ Donovan, J.M., 2017. Human Rights: From Legal Transplants to Fair. *Human Rights*.

⁷⁶⁹ Okon, E.E., 2003. The environmental perspective in the 1999 Nigerian Constitution. *Environmental Law Review*, 5(4), pp.256-278.

⁷⁷⁰ Lusher, A., 2015. Microplastics in the Marine Environment: Distribution, Interactions and Effects. In *Marine Anthropogenic litter* (pp. 245-307). Springer International Publishing.

⁷⁷¹ Olukoju, A., 2003. Maritime Policy and Economic Development: A Comparison of Nigerian and Japanese experiences since the Second World War. *Afrika Zamani*, (11&12), pp.160-182.

taken careful procedures to address the challenges posed by unguided waste disposal at the port. Fewer case indicates that port management procedures have generated required outcome at the ports of Southampton and Apapa, where the waste management structure is designed to meet the needs of all the port users. However, in view of the measure design to address the challenges of ineffective port waste management, waste at the port waste seems to continue to increase along the port waters way thereby obstructing free flow of traffic and economic disruption at the port. that waste remains constant challenge, especially with regards to ship-generated waste.⁷⁷²

The research also discovered that port waste control at the port of less developed nation economies is stained by absence of an administrative regulator and insufficient provision of waste reception facilities.⁷⁷³ For example in Apapa port, ship generated waste is contracted to a single company to manage the flow of waste at the port with no commitment assessment of activities the private company.⁷⁷⁴ Aside port authority, the rest of government agencies mentioned in this research partakes in waste regulatory control within the port. Consequently, many of the function's agencies are replicated, which often lead to conflict of interest among the agencies and ultimately affect the regulation of waste management at the port. A holistic based integrated system of port waste management seems to be one of the solutions to challenge the problem posed in the control of port waste at the Apapa port in Nigerian.⁷⁷⁵

Deficiency of satisfactory waste reception facilities in less developed nations port is such that ships have no alternative other than to dump waste at the port.

⁷⁷² Sadri, S.S. and Thompson, R.C., 2014. On the Quantity and Composition of Floating Plastic Debris Entering and leaving the Tamar Estuary, Southwest England. *Marine Pollution Bulletin*, 81(1), pp.5560.

⁷⁷³ Donau, V. Danube Ports. 2010. Available online: <http://www.danubeports.info> (Assessed on 31 March 2017).

⁷⁷⁴ Ajibola, V.O., Funtua, I.I. and Unuaworho, A.E., 2005. Pollution studies of some water bodies in Lagos, Nigeria. *Caspian Journal of Environmental Sciences*, 3(1), pp.49-54.

⁷⁷⁵ Onwuegbuchunam, D.E., Ebe, T.E., Okoroji, L.I. and Essien, A.E., 2017. An Analysis of Ship-Source Marine Pollution in Nigeria Seaports. *Journal of Marine Science and Engineering*, 5(3), p.39. ⁸²⁹ Henry Ogbuagu, D., Chidiogo Okoli, G. and Asuenime Agbonikhena, N., 2013. Seaport-associated pollutions in Ogu waterway near Port Harcourt. *Management of Environmental Quality: An International Journal*, 24(4), pp.512-525.

However, it seems some ship operators even desire to dump waste at sea, where the possibility of being caught is known, instead of using available facilities and pay the mandatory fees.⁸²⁹ In Central and West African ports, waste reception facilities are now available in different form for port user to use, though, some of the facilities are not up to standard compare to other developed nations, but it appears there is a round peg in the round hole to ensure waste is cater at the port.⁷⁷⁶ In the case of Southampton port, it appears that the system of waste handling has been structured and well organised. In view of findings discovered, it seems Nigeria port has some few things to learn and incorporated into her port management structure to further improve waste management at the port.

The research also, analysed various relevant legal instruments with a view to boost regulation and enforcement by port states, coaster states and flag states control in operation at the Southampton port and Apapa port. For instance, the International Maritime Organization (IMO) convention on Marine Pollution MARPOL 73/78 summaries procedures designed at eradicating the obstinate and premeditated waste dumping into the port areas, waste substances as covered by the legal regulations. Precisely Annexes I, II, III, IV, V and VI of MARPOL 73/78 recognised these sources and by their provision, and by implication port authorities are obliged to make available reception facilities for handling of waste at the port.

The Southampton port and Apapa port produce Port Waste Management Plan, includes general message sent by the ship operators on the type waste and in nature, the port authority would inform the ship operator where the facilities are located, details of providers, costs and notification requirements. The information is available to ensure port facilities are provided to port users, with a view to ensuring that ship needs are met without unnecessary delay. The method adopted so far by IMO as far as the legal regulations and it implementation by port state, flag state and coastal control seems to have produced prolific expectations, especially in curbing waste at the port. However, the provision of the such waste reception facilities at the port must be adequate and meet the need of the port users. For example, at the Apapa port, the

⁷⁷⁶ Kadafa, A.A., Zakaria, M.P. and Othman, F., 2012. Oil spillage and pollution in Nigeria: organizational management and institutional framework. *Journal of Environment and Earth Science*, 2(4), pp.22-30.

researcher discovered that waste around the port from non-accidental sources remains unabated. This is after such waste has been said to be outsourced to a private company for more effective and efficient port waste management, yet waste within and around the port remains little to be appreciated compare with the Southampton port where waste at the port has been reduced to a minimum level.

The implication of the researcher's findings is that, rising levels of port waste from ship-generated discharges might be expected at the Apapa port in the nearest future if waste is not adequately curtailed. For example, recent discoveries also suggest that there were around 32% and 40% upsurges in the amounts of waste handled respectively at the Apapa port waste reception facilities.⁷⁷⁷ The increase in the percentage might be attributed to inadequate monitoring of waste discharge from the ship, lack of adequate profiling of waste or ship coming into the port, and inefficient handling of waste after collection from the ship by those saddled with such responsibility. Comparing this with Southampton port waste management strategy, it seems there is a gap in the way waste is handling at both port. Particularly, the monitoring and waste profiling with a view to knowing the quantity of waste handling by the port. Also, the Southampton port waste reception facilities are up to date in strict compliance with IMO regulations, and other regional directives.

Consequently, the following gaps have further been identified in the various legal regulations that might prevent effective control of waste management at the port.⁷⁷⁸

7.2 Legislative Deficiencies and Lack of Proper Implementation of the Enforcement Procedures of the Legal Regulations on Port Waste Management Measures

The enforcement and implementation of the various legal regulations and management procedures at national level is an important part in combatting waste at the port. Nevertheless, findings have indicated that quite a number of legal frameworks have demonstrated that international law has not been adequately reflected on port waste management structures. Furthermore, where they have been, there is insufficient implementation, execution and penalties to deter violators, as well as a

⁷⁷⁷ Onwuegbuchunam, D.E., Ebe, T.E., Okoroji, L.I. and Essien, A.E., 2017. An Analysis of Ship Source Marine Pollution in Nigeria Seaports. *Journal of Marine Science and Engineering*, 5(3), p.39.

⁷⁷⁸ Nor, N.H.M. and Obbard, J.P., 2014. Microplastics in Singapore's Coastal Mangrove Ecosystems. *Marine Pollution Bulletin*, 79(1), pp.278-283.

lack of clarity in the legal regulations that leaves room for different interpretations. These all appears to pose significant obstacles to control and properly administer waste facilities at the port.

The Southampton port has incorporated the EU Directive on ship-generated waste and provision of adequate reception facilities into their waste management plans, as well as the principal legislation on port waste management (MARPOL) for effective control of waste. However, the latter is yet to be transposed into national law in Nigeria. Thus, from finding there seems to be no suitable legal ground to competently enforce most international convention or implement the revised Annexes in MARPOL both at the local and national level.

The IMO Integrated Global Shipping System (IGSS) has indicated that there are copious of unreported alleged cases of insufficiency of reception facilities worldwide. The transposition of the global conventions on port waste management into local legislation gives opportunity for diverse interpretation on manner of how to initiate waste delivery incentives at the ports. For example, usage of differs waste-fee systems by most ports has further created misconception among ship owners on ports to use for waste disposal. To affect adequate waste delivery from the ship owners, there must be universal regulation of waste delivery fees to avert the disparity in fees often experienced by the ship owners.⁷⁷⁹

7.3 Restrictions of Existing Instruments to Address Port Waste

The limitations in existing legal regulations in addressing waste at the port cannot be over-emphasised in view of the major sources of waste to the port, and deficiency in implementation standards. For instance, most convention on waste management at the port recognises the land-based sources but basically ask nations to tackle the challenge via internal mechanism. Furthermore, MARPOL Annex V exempts unintentional dumping of plastic waste which might result to damage to equipment of ship. The legal framework also exempts ship 400 GT, a type that majority of the fishing

⁷⁷⁹ Chen, Y., Cheng, Z., Zhe, M. and Yuzheng, R., 2015, June. Design on the Framework of the Ship Safety Database. In Transportation Information and Safety (ICTIS), 2015 International Conference on ... The theme of ICTIS (pp. 528-536). IEEE.

ships belong to, from recoding debris, but such waste must be discharge in utmost good faith and observe adequate compliance with discharge legislation.⁷⁸⁰

The lack of enforcement procedures is obvious in the words used in the legal regulations. UNCLOS, for example, encourages member states to use best methods to reduce waste at the port in accordance with their capability. though most state do not have enough financial stands to get necessary fund to buy needed equipment to cater for most at their port to reduce marine pollution.⁷⁸¹ Equally, the Helsinki Convention expects contracting members to take suitable⁷⁸² stand to prevent and eliminate waste at the port.⁷⁸³ This gives opportunity for diverse by member states with divergent legal systems, environmental circumstances and capacities.⁷⁸⁴

7.4 Lack of Adequate Collaboration and Inadequate Participation of States in International and Regional Agreements

In the present of international and regional legal framework that is already in practise, which seems to have provided an avenue for joint collaboration and coordination of port waste challenges, a few instance suggests that either collaborative action on port waste management is defective, or the involvement of states in these arrangement was inadequate.⁷⁸⁵ This might create some sort of gap in the regional and global initiatives, due to the fact that port waste is trans-boundary. For instance, there are no up-to-date legal regulations to challenge management of port waste in Nigeria and the sub-region of West Africa, save those of the Abuja MoU and Bamako Convention,

⁷⁸⁰ Chen, C.L., 2015. Regulation and Management of Marine Litter. In *Marine Anthropogenic Litter* (pp. 395-428). Springer International Publishing (HELCOM 2012).

⁷⁸¹ Regulation and Management of Marine Litter <file:///C:/Users/User/Downloads/272504.pdf> (Assessed on 25 June 2017).

⁷⁸² Potential Gaps in Marine Litter Management

https://www.google.co.uk/search?q=%22Similarly,+the+Helsinki+Convention+requires+contracting+parties+to+take+%E2%80%9Call+appropriate%E2%80%9D+measures+to+prevent+and+eliminate+pollution.%22&qws_rd=cr&ei=LxBNwAPMB6aFgAb7-Z6IDw (Accessed on 23 June, 2017)

⁷⁸³ HELSINKI COMMISSION - Baltic Marine HELCOM 18/97 Environment Protection Commission Convention on the Protection of the Marine Environment of the Baltic Sea Area, 1992.

⁷⁸⁴ Ibid.

⁷⁸⁵ Chen, C.L. and Liu, T.K., 2013. Fill the Gap: Developing Management Strategies to Control Garbage Pollution from fishing vessels. *Marine Policy*, 40, pp.34-40. ⁸⁴⁰ Potential Gaps in Marine Litter Management - Marine Anthropogenic.

http://academlib.com/25002/environment/potential_gaps_marine_litter_management/Assessed (on 26 June 2017). See also, Derraik, J.G., 2002. The Pollution of the Marine Environment by Plastic Debris: a Review. *Marine Pollution Bulletin*, 44(9), pp.842-852.

which seem not comprehensive enough to address the urgent need to curtail the trans-boundary movement of waste from one country to another.

As a matter fact, some regional nations like those of the West Central area do not even partake in most global Initiative and collaboration. Some of these nations adjoining regional seas might not have adequate port waste management structures due to economic challenges, nevertheless several nations in African have recently expelled the usage of plastic bags to collect waste at the port.⁸⁴⁰

7.5 Inadequate Data on Port Waste Management

Notwithstanding the existing legal regulations on port waste management available to curtail waste at the port and to develop new strategies, the current data on the quantities of such waste, its regulation at the port, and its possible chemical and physical influences on marine environment, are inadequate.⁷⁸⁶ The gaps in knowledge with regards to the economic significances of micro-plastics exposure at the port cannot be over emphasised as findings in this thesis suggests that waste hinder port development.⁷⁸⁷ Detailed gaps in the data were identified in several studies. The lack of adequate data recording to examine the quantities of waste collected at the port affects waste collection progress in other to waste challenges in most port. For example, little or no data available in Nigeria and very little is known about the nature and extent of inadequate port waste management in the entire Sub-African West region.

In the United Kingdom, data gaps have been acknowledged, including quantities and numbers, source, transport and effects of port waste to the port. Hence, data challenge seems to be more focused in the UK and are kept for future use to address port challenges including feedbacks from port users with regards to longstanding and large-scale supervision across ports and environments, as well as dynamism in determined organic pollutants through plastics via the marine food chain.

⁷⁸⁶ Galgani, F., Hanke, G., Werner, S.D.V.L. and De Vrees, L., 2013. Marine litter Within the European Marine strategy framework directive. ICES Journal of Marine Science: Journal du Conseil, 70(6), pp.1055-1064.

⁷⁸⁷ Chen, C.L., 2015. Regulation and Management of Marine litter. In Marine Anthropogenic Litter (pp. 395-428). Springer International Publishing.

7.6 The Structure of Government in Both the UK and Nigeria

Government structure in both countries under consideration has influenced to some extent the manner in which waste is managed at the port. Notwithstanding the fact that the legal regulations are similar, government programmes and policies seems to affect effective port waste management. In a situation where such policies are not properly stabilised and structured by successive governments, it might create some challenges for any agreement entered by the past government. Government must show commitment to international legal instruments that are geared towards eradication of waste at the port. Nigeria can look into how successive government administration in the UK has been able to manage existing international commitments without necessarily jettisoning it because they do not fit into the present-day government's programme.

This type of government attitude is common mostly in developing nations like Nigeria, and there is a need for attitudinal changes towards past commitment by previous governments. Hence, even though Nigeria has agreed to some of the international legal regulations on port waste management, regrettably these have not been domesticated. The implication of the above is that these legal instruments only exist on paper without the necessary enforcement machinery to back them up. In other words, no matter powerful an international legal instrument is, if it is not domesticated it might tantamount to a dog that can bark but cannot bite.

At the international level, the research also highlighted relevant legal instruments and controls that has been made available to enhance procedure for implementation through the port states, flag states and coastal states control. For example, the International Maritime Organization (IMO) convention on Marine Pollution MARPOL 73/78 summaries procedures aimed at eradicating the intentional and nonintentional dumping of waste substance of any category into the port, such as, garbage, packaging and sewage. Precisely Annexes I, II, III, IV, V and VI of MARPOL 73/78 note these sources and by their provision, port authorities both in the UK and Nigeria are required to make available waste reception facilities for handling of various categories of waste from the ship. Also, the legal regulations required both the UK and Nigeria ports to have waste management system that includes, information on the type

of waste to be disposed, notification requirements detail of the waste providers, cost and location of the facilities.

Port waste management systems are to be made available to port users, to ensure that ship wastes disposal is met promptly without delay. The procedures adopted so far by IMO with regards to the legal regulations and their implementation by coastal state, flag state and port state control seems to have produced some productive results, particularly in curbing ship-generated waste. However, ship-generated waste appears to continue unabated and the port authority seems to be been found wanting with regards to the availability of adequate port waste reception facilities in developing country like Nigeria. The consequence might be the level of port waste pollution will rise from ship-generated discharges that are projected at the port in the long run if is not properly checked. Although, the Southampton port in the UK cannot be said to have sufficiently obeyed the provisions of the various international regulations, nevertheless, finding indicates that substantial aspect of the law is complied with and waste reception facilities are made available to port users unlike Nigeria.

Similarly, absence of adequate waste reception facilities in developing country port like Nigeria is such that ship has no alternative than to dump waste wilfully at sea. Nevertheless, in developed country some ship owners prefer to dump waste at sea, where the risk of being caught is very low, instead of using facilities available at the port and pay the require fess, hence adequate monitoring of the marine environment cannot be over emphasised in both the UK and Nigeria. In Nigeria ports, waste reception facilities are beginning to be available in various categories, though still insufficient hence ship waste collection procedures at the port is not only ineffective but also its management remains inadequate. For example, the Nigeria Ports Authority (NPA) who coordinate activities at the ports outsource the availability of waste reception facilities from ship to a private pollution control company like the UK and does not own or operate any waste facilities. However, overconcentrated of responsibility to a single company to cater for ship-generated waste at the port in Nigeria has not been yielding much desire result. And degree of awareness in waste service collections and waste management regulations are well noted in both countries, but the percentage of ineffective port waste management in Nigeria is lower than the UK.

In addition, environmental education, population, and cost of waste management, among others, are factors influencing ineffective port waste management in Nigeria compare to the UK. The quantity and rate of wastes generation in Nigeria port has also outgrown the capacity of facilities available compare with the UK where such facilities are readily available to use. Consequently, Nigeria still has few miles to cover in the area of environmental education, provision of waste reception facilities and awareness to put off the long-acquired practise of unethical waste disposal by shipowners, port stakeholders and quest for second-hand goods that has made Nigeria a victim of dumping ground of wastes from developed nations like the UK. There also need to enlighten the Nigeria port stakeholders on waste management policies and enforcement of both international and municipal laws at the Nigerian port. Nigeria government like the UK must strengthen collection and disposal of waste schemes in every port strengthening and implementing the relevant laws to avoid ineffective waste management system at the port.

7.7 Recommendations

In view of the above and bearing in mind the pertinent findings that has been set out in the literature, recommendations for improvements are set out as follows:

7.7.1 Development of a New International Instrument to Tackle the Port Waste Problem

In view of the existing scope international law, which might not be able to support the measure of challenges, severity of the port waste problem, the global community should be encouraged to advance a new multilateral treaty analogous to Montreal Protocol in 1989. A set of elements have been projected to be among such initiative, including adequate regulation of waste disposal from both land and on the sea, adoption of international tracking system for waste management, enhancement of monitoring capacity to ensure prompt response to distress call from port waste facilities user, enforcement standards and introduction of whistle blower to deter waste offenders.

7.7.2 Modifying Present Instruments to Narrow Exceptions and Elucidate

Enforcement Standards

Given the long period of time needed to advance and implement a new set of agreements, modifications of the existing policies are recommended. This is to ensure that some of the deficiencies are eliminated. For instance, it is now imperative to improve the current ship size and tonnage limitations as provided for, in Annex V. Issues such as waste management strategies, respecting placards, and waste record books should be amended to ensure that fewer vessels are exempted.

It is recommended that MARPOL Annex V be amended in order to provide specific guidance on losses due to accidents caused by fishing gears. Concerning the ambiguous meaning of the fee systems in the EU PRF Directive, a more universal system of waste landing fees is recommended in order to deter waste dumping into the marine environment.

7.7.3 Creation of All-Inclusive National Port Waste Management Schemes

Port waste is a trans-boundary issue, as it crosses scales, sectors and social divisions.⁷⁸⁸ To solve this problem, individual state is expected to develop its own national port waste management scheme. This measure will require a high degree of political commitment as a catalyst for appropriate actions to be commenced and ensure that port waste management challenges are reflected in all policy making. Such programmes must be robust enough to tackle the anomalies previously mentioned. While also aiming to reduce waste, efforts should also be extended to quantifying the sources of waste from land and sea as a way of promoting culture change that would consider wastes as resources. To enhance active implementation, such policies should obviously analyse their objectives, develop a robust and combined management regulatory scheme, implement suitable actions such as research and monitoring incentive schemes, infrastructure, education, implementation and compliance, develop private public partnerships with community engagement. In

⁷⁸⁸ Hastings, E. and Potts, T., 2013. Marine Litter: Progress in Developing an Integrated Policy Approach in Scotland. *Marine Policy*, 42, pp.49-55.

precision, such plans, might focus on port continuing waste management initiatives that can facilitate full disposal and collection procedure, because management of general wastes on land directly affects the extents of maritime waste.⁸⁴⁴

7.7.4 Enhancing Participation and Cooperation of States in International and Regional Initiatives

The trans-boundary nature of port waste underscores the fact that the challenge is universal in measure and its impact is felt internationally. In this instance, national procedures alone appear inadequate to regulate port waste. This means that regional and international collaboration is essential. An empirical study on waste information has suggested that ocean-based waste supervision should be combined at a global or regional level. Different initiatives on national port waste management schemes (such as UNEP RSP, and GPML as well as regional sea instruments) have developed a strategy for member states to involve in collaboration. This suggests that involvement and collaboration should be encouraged and thus reinforced to allow the figure of participating nations and the substantiality of such cooperation.⁸⁴⁵

Dialogue among countries on excellent practices on port waste management scheme allows for considerable arrangement and collaboration to enhance enforcement of more active and practical management procedures. For example, like standardisation of management of waste methods, the management of technologies in solid waste disposal, the time in giving notification for waste disposal and applicable fee payable for such waste to be disposed. Furthermore, this would help fewer wealthy countries to improve their management, both sewage and solid waste via financial and technical aid and training provided more advanced nations and international bodies.⁷⁸⁹

7.7.5 Strengthening Management Measures on Fishing Vessels

Though previous studies like Ribeiro, M.C.D.C.M., 2015 might have suggested that fisheries activities along the waterways constitute the source of port waste, but majority fishing vessels are excluded from the discharge regulations of Annex V of

⁷⁸⁹ Ibid.

MARPOL 73/78 in view of their low tonnage.⁷⁹⁰ In consonance with the former approvals on the amendment of Annex V to narrow exemptions, two new strategies based on the area of operations for these fishing vessels can be proffered. For ship plying only in national waters, requisite management measures should be clearly developed and reinforced.⁷⁹¹ Additionally, different measures could be adopted, ranging from fitting satisfactory PRFs,⁷⁹² inspiring environmental education, encouraging lost gear recovery practice, facilitating eco-friendly gear usage, enhancing spatial management to minimise gear conflict, and improving gear marking.⁷⁹³ Some of those strategies could likewise apply to similar categories of small ship (e.g. pleasure crafts), which are also exempted from Annex V.

7.8 Conclusion

The problem of port waste management appears to be complex, since it is established in the overarching generation and utilisation methods for production and consumption ways of disposing and managing waste. Solving this challenge requires the addition of a variety of events, plans and sources that cannot be solved by a single procedure. A global awareness geared towards decrease in port waste should be strengthened as the centre of all solutions management, as this would essentially be seen in decreased in waste into marine environment and oceans. Different system at the global, national and regional levels have been enhanced, hence enforcement mechanisms should be adequately enhanced to ensure waste in port is addressed in line with the legal regulations.

In this research, the central systems of legal legislations were assessed and a few of them, such as precise management procedures contained therein, were outlined through illustration. This means that the procedures on port waste are either on a compulsory or volunteer basis. Additionally, based on the principal purposes,

⁷⁹⁰ Ribeiro, M.C.D.C.M., 2015. Maritime safety and environmental protection in Europe: multiple layers in regulation and compliance.

⁷⁹¹ Wright, S.L., Thompson, R.C. and Galloway, T.S., 2013. The Physical Impacts of Microplastics on Marine Organisms: a review. *Environmental Pollution*, 178, pp.483-492.

⁷⁹² Ibid.

⁷⁹³ Oliveira, F., Monteiro, P., Bentes, L., Henriques, N.S., Aguilar, R. and Gonçalves, J.M., 2015. Marine litter in the upper São Vicente submarine canyon (SW Portugal): Abundance, Distribution, Composition and Fauna Interactions. *Marine Pollution Bulletin*, 97(1), pp.401-407.

procedures within the port management chain were roughly separated into four classes: behaviour-changing, precautionary, mitigating, removing and. In so doing, the research has further discovered the potential knowledge gaps in the existing regulatory legal frameworks and suggested recommendations for improvement.

The recommendations include establishing a more recent international legislation targeted at reducing port waste management problems, amending the existing legislation to pinpoint exemptions and explain implementation procedures, creating comprehensive national port waste programmes, encourage participation that would ensure the collaboration of states about international and regional initiatives, and mapping out strategies to avoid waste from ships.

As with other marine environmental challenges, port waste might be disallowed and measured via an active partnership on education and other outreach programmes, robust procedures and strategies, efficient implementation, and satisfactory infrastructural support. Also, as part of the suggested recommendations, installations of the state-of the art CCTV technology should be introduced to monitor the port environment where human surveillance fails. This could be used to detect the depositors of waste within the port and its environment.

Based on this perspective, I hope that the identification of potential gaps in current regulatory management legal framework, and the recommendations suggested, will enhance quality management of port waste. Last but more importantly, it is envisioned that through the on-going initiatives to combat port waste, a shared vision for “waste-free port environments” would be appreciated among various stakeholders and actors within the maritime environment. Resources should be adequately harnessed via constant training, consultations, workshops to always brainstorm on any challenges that might arise in the nearest future on port waste management and port authorities should prioritise adequate implementation of resolution and legal framework.

REFERENCES

- Anderson, A.W., 1975. National and International Efforts to Prevent Traumatic Vessel Source Oil Pollution. *U. Miami L. Rev.*, 30, p.985.
- Anderson, D.H., 1996. Investigation, detention and release of foreign vessels under the UN Convention on the Law of the Sea of 1982 and other international agreements. *The International Journal of Marine and Coastal Law*, 11(2), pp.165-177.
- Anderson, D., 1998. The roles of flag States, port States, coastal States and international organisations in the enforcement of international rules and standards governing the safety of navigation and the prevention of pollution from ships under the UN convention on the law of the sea and other international agreements. *Sing. J. Int'l & Comp. L.*, 2, p.557.
- Anderson, D., 2002. The Effect of Sort State Control on Substandard Shipping. *Maritime Studies*, 2002(125), pp.20-25.
- Anderson, S., Browne, M. and Allen, J., 1999. Logistics Implications of The UK Packaging Waste Regulations. *International Journal of Logistics: Research and Applications*, 2(2), pp.129-145.
- Arksey, H. and Knight, P.T., 1999. *Interviewing for social scientists: An introductory resource with examples*. Sage. And see Groenewald, T., 2004. A phenomenological research design illustrated. *International journal of qualitative methods*, 3(1), pp.42-55.
- Arlosoroff, S., 1985. WB/UNDP—Integrated Resource Recovery Project: Recycling of Wastes in Developing Countries. In *Appropriate Waste Management for Developing Countries* (pp. 81-94). Springer, Boston, MA.
- Asano, T. ed., 2016. *Artificial recharge of groundwater*. Elsevier.
- Asgari, N., Hassani, A., Jones, D. and Nguye, H.H., 2015. Sustainability ranking of the UK major ports: methodology and case study. *Transportation research part E: logistics and transportation review*, 78, pp.19-39.
- Associated British Ports; Associated British Ports Environmental Statement. Available from: (<http://environment.abports.ac.uk/policy.htm>). (Assessed on 24 May 2016).

- Babaei, A.A., Alavi, N., Goudarzi, G., Teymouri, P., Ahmadi, K. and Rafiee, M., 2015. Household recycling knowledge, attitudes and practices towards solid waste management. *Resources, Conservation and Recycling*, 102, pp.94-100.
- Babatunde, I.O. And Akpambang, E.M., 2017. Impediments to Enforcement of Environmental Treaties Against Oil Pollution. *Nnamdi Azikiwe University Journal of International Law and Jurisprudence*, 8(2), pp.12-27.
- Babayemi, J.O., Ogundiran, M.B. and Osibanjo, O., 2017. Current Levels and Management of Solid Wastes in Nigeria. *Environmental Quality Management*, 26(3), pp.29-53.
- Berger, H., Horvat, I. and Simongáti, G., 2014. Ship waste management along the Danube: the way towards an International Danube Ship Waste Convention. *Waste Manag. Environ*, 180, pp.53-64.
- Baker, S.E. and Edwards, R., 2016. How many qualitative interviews is enough? Expert voices and early career reflections on sampling and cases in qualitative research. 2012. Southampton; National Centre for Research Methods and ESRC.
- Ajibola, V.O., Funtua, I.I. and Unuaworho, A.E., 2005. Pollution studies of some water bodies in Lagos, Nigeria. *Caspian Journal of Environmental Sciences*, 3(1), pp.49-54.
- Bogdan, R. and Biklen, S.K., 1992. *Qualitative research for education*.
- Barnes-Dabban, H., Van Koppen, K. and Mol, A., 2017. Environmental reform of West and Central Africa ports: the influence of colonial legacies. *Maritime Policy & Management*, 44(5), pp.565-583.
- Ball, I., 1999. Port Waste Reception Facilities in UK Ports Iwan Ball. *Marine Policy*, 23(4-5), Pp.307-327.
- Bang, H.S. and Jang, D.J., 2012. Recent developments in regional memorandums of understanding on port state control. *Ocean Development & International Law*, 43(2), pp.170-187.
- Bang, H.S., 2008. Is Port State Control an Effective Means to Combat Vessel-Source Pollution? An Empirical Survey of the Practical Exercise by Port States of Their Powers of Control. *The International Journal of Marine and Coastal Law*, 23(4), pp.715-759.

- Bang, H.S., 2013. Recommendations for Polices on Port State Control and Port State Jurisdiction. *J. Mar. L. & Com.*, 44, p.115.
- Bang, H.S., 2008. Is port state control an effective means to combat vessel-source pollution? An empirical survey of the practical exercise by port states of their powers of control. *The International Journal of Marine and Coastal Law*, 23(4), pp.715-759.
- Boyle, A.E., 1985. Marine pollution under the Law of the Sea Convention. *American Journal of International Law*, 79(2), pp.347-372.
- Barker, A. and Wood, C., 1999. An evaluation of EIA system performance in eight EU countries. *Environmental Impact Assessment Review*, 19(4), pp.387-404.
- Becker, R., 1997. MARPOL 73/78: An Overview in International Environmental Enforcement. *Geo. Int'l Envtl. L. Rev.*, 10, p.625.
- Breitling, U. and Leader, G.T., 2010, August. Sustainable shipping and port development. In 5th Regional EST Forum in Asia.
- Bert, R., Book Review: Shipping and Ports in the Twenty-First Century: Globalisation, Technological Change and the Environment, edited by David Pinder and Brian Slack, London: Routledge, 2004. *Civil Engineering—ASCE*, 74(9), pp.71-71.
- Blackman Jr, W.C., 2016. Basic hazardous waste management. Crc Press.
- Bloor, M.J., Baker, S.C. and Sampson, H., 2012. Effectiveness of International Regulation of Pollution Controls: The Case of the Governance of Ship Emissions-Interim Report.pp.235-345.
- Board, O.S. and National Research Council, 2009. Tackling Marine Debris in the 21st Century. National Academies Press.
- Bodansky, D., 1991. Protecting the Marine Environment from Vessel-Source Pollution: UNCLOS III and beyond. *Ecology LQ*, 18, p.719.
- Boos, M.L., 1991. The Oil Pollution Act of 1990: Striking the Flags of Convenience. *Colo. J. Int'l Envtl. L. & Pol'y*, 2, p.407.
- Boréus, K. and Bergström, G., 2017. Content analysis. *Analyzing Text and Discourse: Eight Approaches for the Social Sciences*, 23.
- Boyle, A.E., 1985. Marine Pollution Under the Law of the Sea Convention. *American Journal of International Law*, 79(2), pp.347-372.

- Brans, E.H., 2018. The Environmental Liability Directive: Legal Background and Requirements. In *Equivalency Methods for Environmental Liability* (pp. 3-20). Springer, Dordrecht.
- Breitling, U. and Leader, G.T., 2010, August. Sustainable Shipping and Port Development. In *5th Regional EST Forum in Asia*.
- Broadus, J.M. and Gaines, A.G., 1987. Coastal and Marine Area Management in the Galápagos Islands. *Coastal Management*, 15(1), pp.75-88.
- Brooks, M.R. and Cullinane, K. eds., 2006. *Devolution, Port Governance and Port Performance* (Vol. 17). Elsevier.
- Brown, E.D., 2001. *Sea-bed Energy and Minerals: Sea-bed mining* (Vol. 2). Martinus Nijhoff Publishers.
- Brown, S.H., White, E.B., Pechulis, M. and Carman, R., 1999. Integrated liquid discharge system for waste disposal on future Surface combatants. *Naval engineers journal*, 111(3), pp.285-291.
- Bryman, A. and Bell, E., 2015. *Business research methods*. Oxford University Press, USA.
- Butt, N., 2007. The impact of cruise ship generated waste on home ports and ports of call: A study of Southampton. *Marine Policy*, 31(5), pp.591-598.
- Byrne, M.M., 2001. Evaluating the Findings of Qualitative Research. *AORN Journal*, 73(3), p.706.
- Campos, L.M., de Melo Heizen, D.A., Verdinelli, M.A. and Miguel, P.A.C., 2015. Environmental performance indicators: a study on ISO 14001 certified companies. *Journal of Cleaner Production*, 99, pp.286-296.
- Cardwell, P.J. and French, D., 2007. Who Decides? The ECJ's Judgment on Jurisdiction in the MOX Plant Dispute: Failure of a Member State to fulfil obligations—United Nations Convention on the Law of the Sea—Part XII—Protection and preservation of the marine environment—Dispute-settlement system provided for under that convention—Arbitration proceedings initiated on the basis of that system by Ireland against the United Kingdom—Dispute relating to the MOX plant at Sellafield (United Kingdom)—Irish Sea—Articles 292 EC and 193 EA.... *Journal of Environmental Law*, 19(1), pp.121-129.

- Cariou, P., Mejia, M.Q. and Wolff, F.C., 2008. On the Effectiveness of Port State Control inspections. *Transportation Research Part E: Logistics and Transportation Review*, 44(3), pp.491-503.
- Cariou, P., Mejia Jr, M.Q. and Wolff, F.C., 2007. An econometric analysis of deficiencies noted in port state control inspections. *Maritime Policy & Management*, 34(3), pp.243-258.
- Cilliers, J.K.J., 2008. The African Standby Force An update on progress.
- Cho, J.Y. and Lee, E.H., 2014. Reducing confusion about grounded theory and qualitative content analysis: Similarities and differences. *The qualitative report*, 19(32), p.1.
- Cariou, P., Mejia, M.Q. and Wolff, F.C., 2009. Evidence on Target Factors Used for Port State Control Inspections. *Marine Policy*, 33(5), pp.847-859.
- Carlin, E.M., 2002. Oil pollution from ships at sea: The ability of Nations to Protect a Blue Planet. *Environmental Regime Effectiveness: Confronting Theory with Evidence*.
- Carpenter, A. and Macgill, S., 2001. Charging for Port Reception Facilities in North Sea ports: Putting theory into practice. *Marine pollution bulletin*, 42(4), pp.257-266.
- Carpenter, A. And Macgill, S.M., 2000. The New Eu Directive on Port Reception Facilities for Ship-Generated Waste and Cargo Residues: An Evaluation. *Wit Transactions on The Built Environment*, 51.
- Carpenter, A. and Macgill, S.M., 2005. The EU Directive on Port Reception Facilities for Ship-Generated Waste and Cargo Residues: The Results of a Second Survey on The Provision and Uptake of Facilities in North Sea Ports. *Marine Pollution Bulletin*, 50(12), Pp.1541-1547.
- Carpenter, Angela, And Sally Macgill., 2001. Charging for Port Reception Facilities in North Sea Ports: Putting Theory into Practice. *Marine Pollution Bulletin* 42, (4), pp. 257-266.
- Charmaz, K., 2017. The power of constructivist grounded theory for critical inquiry. *Qualitative inquiry*, 23(1), pp.34-45.
- Chartier, Y. ed., 2014. Safe management of wastes from health-care activities. World Health Organization.

- Chen, C.L. and Liu, T.K., 2013. Fill the Gap: Developing Management Strategies to Control Garbage Pollution from fishing vessels. *Marine Policy*, 40, pp.34-40.
- Chen, C.L., 2015. Regulation and management of marine litter. In *Marine anthropogenic litter* pp. 395-428.
- Chen, Chung-Ling., 2015 "Regulation and Management of Marine Litter." In *Marine Anthropogenic Litter*, Pp. 395-428. Springer International Publishing, pp.44.
- Chen, Y., Cheng, Z., Zhe, M. and Yuzheng, R., 2015, June. Design on the Framework of the Ship Safety Database. In *Transportation Information and Safety (ICTIS), 2015 International Conference on ... The theme of ICTIS* pp. 528-536.
- Chinonyerem, N.T., Ntor-Ue, M., Chukwudi, I.C. and Chinedum, O., 2017. Economic Implications of Marine Oil Spill to Nigeria: A Case for Improvement in Coastal Pipeline Management and Surveillance Practices. *International Journal of Economy, Energy and Environment*, 2(3), p.40.
- Chircop, A., 2002. Ships in distress, Environmental threats to Coastal States, and Places of Refuge: New Directions for an Ancient Regime. *Ocean Development & International Law*, 33(2), pp.207-226.
- Cho, J.Y. and Lee, E.H., 2014. Reducing confusion about grounded theory and qualitative content analysis: Similarities and differences. *The Qualitative Report*, 19(32), p.1.
- Christopher F. Wooldridge, Christopher M. and Vicki Howe, "Environmental Management of Ports and Harbours Implementation of Policy Through Scientific Monitoring", *Marine Policy*, Vol.23, No. 4-5, 1999, pp. 413-425.
- Chua, T.E., Bonga, D. and Bermas-Atrigenio, N., 2006. Dynamics of Integrated Coastal Management: PEMSEA's Experience. *Coastal Management*, 34(3), pp.303-322.
- Churchill, R.R. and Lowe, A.V., 1999. *The Law of the Sea*. Manchester University Press.
- Cohen, A.N., 1998. Ships' Ballast Water and the Introduction of Exotic Organisms into the San Francisco Estuary: Current Status of the Problem and Options for Management (p. 90). Richmond, CA: San Francisco Estuary Institute.
- Cole, M., Lindeque, P., Halsband, C. and Galloway, T.S., 2011. Microplastics as Contaminants in the Marine Environment: A Review. *Marine Pollution Bulletin*, 62(12), pp.2588-2597.

- Cole, S., Codling, I.D., Parr, W., Zabel, T., Nature, E. and Heritage, S.N., 1999. Guidelines for Managing Water Quality Impacts within UK European Marine sites. Swindon: Water Research Centre.
- CONSTANT, A.E., 1975. Marine Pollution Control: Part Iii—Ship Design Requirements; The Design Approach. *Naval Engineers Journal*, 87(5), pp.47-55.
- Contandriopoulos, D., Larouche, C., Breton, M. and Brousselle, A., 2015. A sociogram is worth a thousand words: proposing a method for the visual analysis of narrative data. *Qualitative Research*, p.1468794116682823.
- Costa, F.C., Denny, D.M.T., Heckler, G., Zanethi, L.R. and Pereira Soares, W.L., 2016. Environmental Compliance over Marine Fuels.
- Craine, L.E., 2017. *Water management innovations in England*. Routledge.
- Creswell, J.W. and Creswell, J.D., 2017. *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Cullinane, K. and Song, D.W., 2002. Port Privatization Policy and Practice. *Transport Reviews*, 22(1), pp.55-75.
- Chamorro, C., Mendoza, K.H., Haeseldonckx, D. and Vandecasteele, C., 2018. On the evolution of “Cleaner Production” as a concept and a practice. *Journal of Cleaner Production*, 172, pp.3323-3333.
- Carpenter, A., Lozano, R., Sammalisto, K. and Astner, L., 2018. Securing a port's future through Circular Economy: Experiences from the Port of Gävle in contributing to sustainability. *Marine pollution bulletin*, 128, pp.539-547.
- Clark, X., Dollar, D. and Micco, A., 2004. Port efficiency, maritime transport costs, and bilateral trade. *Journal of development economics*, 75(2), pp.417-450.
- Curtis, J.B., 1984. Vessel-Source Oil Pollution and MARPOL 73/78: An International Success Story. *Envtl. L.*, 15, P.679.
- Dalal, A.K. and Priya, K.R., 2016. *Introduction to qualitative research. Qualitative Research on Illness, Wellbeing and Self-Growth: Contemporary Indian Perspectives*.
- Darbra, A. Ronza, J. Casal, T.A. Stojanovic And C. Wooldridge, “The Self-Diagnosis Method, A New Methodology to Assess Environmental Management In Sea Ports”, *Marine Pollution Bulletin* 48(2004) pp.420-428.

- de La Fayette, L., 1996. Access to ports in international law. *The International Journal of Marine and Coastal Law*, 11(1), pp.1-22.
- Darbra, R.M., Pittam, N., Royston, K.A., Darbra, J.P. and Journee, H., 2009. Survey on Environmental Monitoring Requirements of European Ports. *Journal of Environmental Management*, 90(3), pp.1396-1403.
- Davarzani, H., Fahimnia, B., Bell, M. and Sarkis, J., 2016. Greening ports and maritime logistics: A review. *Transportation Research Part D: Transport and Environment*, 48, pp.473-487.
- Davenport, J. and Davenport, J.L., 2006. The Impact of Tourism and Personal Leisure Transport on Coastal Environments: A Review. *Estuarine, Coastal and Shelf Science*, 67(1), pp.280-292.
- David G., Patrick Rigot-Muller, John M. And Chandra L, "The Role of Sea Ports in End-To-End Maritime Transport Chain Emissions", *Energy Policy*, 64, 2014, pp.337-348.
- de La Fayette, L., 2001. Protection of the Marine Environment in 2000. *Envtl. Pol'y & L.*, 31, p.140.
- De La Fayette, L., 2001. The Marine Environment Protection Committee: the conjunction of the Law of the Sea and international environmental law. *The International Journal of Marine and Coastal Law*, 16(2), pp.155-238.
- De La Fayette, Louise A.2005. "New Approaches for Addressing Damage to the Marine Environment." *Int'l J. Marine & Coastal L.* 20 (2005), pp.167.
- De Langen, P.W. and Nijdam, M.N., 2007. Charging Systems for Waste Reception Facilities In Ports and the Level Playing field: A case from North-West Europe. *Coastal Management*, 36(1), pp.109-124.
- de Souza Melaré, A.V., González, S.M., Faceli, K. and Casadei, V., 2017. Technologies and decision support systems to aid solid-waste management: a systematic review. *Waste management*, 59, pp.567-584.
- Deery, M., Jago, L. And Fredline, L., 2012. Rethinking Social Impacts of Tourism Research: A New Research Agenda. *Tourism Management*, 33(1), pp.64-73.
- Depledge, M.H., Galgani, F., Panti, C., Caliani, I., Casini, S. and Fossi, M.C., 2013. Plastic Litter in the Sea. *Marine Environmental Research*, 92, pp.279-281.
- Dimitrios A.G., 2007 The Use of the Deposit-Refund Framework in Port Reception Facilities Charging Systems. *Marine Pollution Bulletin*, 54, pp. 508-520.

- Din, G.Y. and Cohen, E., 2016. Modeling municipal solid waste management in Africa: case study of Matadi, the Democratic Republic of Congo. *Solid Waste Management: Policy and Planning for a Sustainable Society*, p.81.
- Dinwoodie, J., Tuck, S., Knowles, H., Benhin, J. and Sansom, M., 2012. Sustainable Development of Maritime Operations in Ports. *Business Strategy and The Environment*, 21(2), Pp.111-126.
- Dionis, A., Adrián, M.C., González, J.A., Luis, S.R., Padrón, F. and Peña, A., 2017. Implementation and Benefits of Environmental Management System (UNE-en ISO 14001: 2004 Standard) In Shipping Company. *Journal of Maritime Research*, 13(1), pp.79-83.
- DIRECTIVE, H.A.T., 1997. The Council of The European Union. *Official Journal L*, 10(14/01), pp.0013-0033.
- Dodbiba, G., Murata, K., Okaya, K. and Fujita, T., 2016. Liberation of various types of composite materials by controlled underwater explosion. *Minerals Engineering*, 89, pp.63-70.
- Dogarawa, L.B., 2014. Maritime Archives Administration in Nigeria: A Blueprint. *Journal of Maritime Research*, 6(3), pp.59-74.
- Donald, J.W., 1992. The Bamako Convention as a Solution to the Problem of Hazardous Waste Exports to Less Developed Countries. *Colum. J. Envtl. L.*, 17, p.419.
- Donovan, J.M., 2017. *Human Rights: From Legal Transplants to Fair*. Human Rights.
- Downes, D.R., Dellapenna, J., Ditthavong, K., Freedman, J., Gardner, R.C., Gravalles, D.M., Horsch, R.A., Hunter, D., Klein, J.M., Redick, T.P. and Thorson, E., 2009. *International Environmental Law*. *The International Lawyer*, pp.837-860.
- Dupuy, P.M., 1998. The danger of fragmentation or unification of the international legal system and the International Court of Justice. *NYUJ Int'l L. & Pol.*, 31, p.791.
- Duruigbo, E., 2000. Reforming the International Law and Policy on Marine Oil Pollution. *J. Mar. L. & Com.*, 31, p.65.
- Dwarakish, G.S. and Salim, A.M., 2015. Review on the Role of Ports in the Development of a Nation. *Aquatic Procedia*, 4, pp.295-301.
- Ebeku, K.S., 2007. Constitutional right to a healthy environment and human rights approaches to environmental protection in Nigeria: *Gbemre v. Shell revisited*.

- Review of European, Comparative & International Environmental Law, 16(3), pp.312-320.
- Ehlers, P.N., Borgese, E.M., Wolfrum, R. and Hoszlig, C. eds., 2002. *Marine Issues: from a Scientific, Political and Legal Perspective*. Martinus Nijhoff Publishers, pp.204-379.
- Ejimabo, N.O., 2015. The Effective Research Process: Unlocking the Advantages of Ethnographic Strategies in The Qualitative Research Methods. *European Scientific Journal, ESJ*, 11(23).
- Eltis, D., 2001. The Volume and Structure of The Transatlantic Slave Trade: A Reassessment. *The William And Mary Quarterly*, 58(1), pp.17-46.
- Huang, P.S. and Shih, L.H., 2009. Effective Environmental Management Through Environmental Knowledge Management. *International Journal of Environmental Science & Technology*, 6(1), pp.35-50.
- Di Vaio, A. and Varriale, L., 2018. Management Innovation for Environmental
- Erik Jaap Molenaar and B. Pons., 2009 EU Directive on Port State Control in Context. *The international Journal of Marine and Coastal law*, 11, (2), pp. 241-288.
- Eriksson, P. and Kovalainen, A., 2015. *Qualitative methods in business research: A practical guide to social research*. Sage.
- Everett, S., 2007. Port reform in Australia: Regulation Constraints on Efficiency. *Maritime Policy & Management*, 34(2), pp.107-119.
- Fasoli, E., 2017. The Possibilities for Nongovernmental Organisations Promoting Environmental Protection to Claim Damages in Relation to the Environment in France, Italy, the Netherlands and Portugal. *Review of European, Comparative & International Environmental Law*, 26(1), pp.30-37.
- Ferraro, G. and Pavliha, M., 2010. The European and International Legal Framework on Monitoring and Response to Oil Pollution from Ships. *Journal of Environmental Monitoring*, 12(3), pp.574-580.
- Fischer, T.B., Jha-Thakur, U. and Hayes, S., 2015. Environmental impact assessment and strategic environmental assessment research in the UK. *Journal of Environmental Assessment Policy and Management*, 17(01), p.1550016.
- Flick, U., 2017. *Doing Qualitative Data Collection—Charting the Routes*. The SAGE Handbook of Qualitative Data Collection, p.1.

- Gaines, S.E., 1990. Taking responsibility for transboundary environmental effects. *Hastings Int'l & Comp. L. Rev.*, 14, p.781.
- Galdies, C., 2008. Ship-Generated Oil Discharges and Exhaust Emissions in the Mediterranean Basin: Their Distribution and Impact. PhD (editors). 2008, p.57.
- Galgani, F., Hanke, G., Werner, S.D.V.L. and De Vrees, L., 2013. Marine Litter Within the European Marine Strategy Framework Directive. *ICES Journal of Marine Science: Journal du Conseil*, 70(6), pp.1055-1064.
- Gasson, S., 2004. Rigor in grounded theory research: An interpretive perspective on generating theory from qualitative field studies. *The handbook of information systems research*, 4, pp.79-102.
- Gallagher, M.E., 2014. The Time is Now: The United States Needs to Accede to the United Nations Convention on the Law of the Sea to Exert Influence Over the Competing Claims in the South China Sea. *Temp. Int'l & Comp. LJ*, 28, p.1.
- Galley, M., 2014. Legislation. In *Shipbreaking: Hazards and Liabilities*. Springer International Publishing, pp. 55-98.
- Gardner, B., Marlow, P. and Pettit, S., 2006. Full Cost Recovery in EU Ports Operating as Commercial Undertakings. *Transport Policy*, 13(1), pp.2-21.
- Garnwa, P., Beresford, A. and Pettit, S., 2009. Dry ports: A Comparative Study of the United Kingdom and Nigeria. *Development of Dry Ports*, 40.
- Gehman, J., Glaser, V.L., Eisenhardt, K.M., Gioia, D., Langley, A. and Corley, K.G., 2017. Finding Theory–Method Fit: A Comparison of Three Qualitative Approaches to Theory Building. *Journal of Management Inquiry*, p.1056492617706029.
- Georgakellos, D.A., 2007. The Use of The Deposit–Refund Framework in Port Reception Facilities Charging Systems. *Marine Pollution Bulletin*, 54(5), pp.508-520.
- Gertsakis, J. and Lewis, H., 2003. Sustainability and The Waste Management Hierarchy. Retrieved on January 30, P.2008.
- Ghiani, G., Manni, A., Manni, E. and Toraldo, M., 2014. The impact of an efficient collection sites location on the zoning phase in municipal solid waste management. *Waste management*, 34(11), pp.1949-1956.

- Gibbs, D., Rigot-Muller, P., Mangan, J. and Lalwani, C., 2014. The Role of Sea Ports in End-To-End Maritime Transport Chain Emissions. *Energy Policy*, 64, DO: Specific. pp.337-348.
- Glaser, B., 2017. *Discovery of grounded theory: Strategies for qualitative research*. Routledge.
- Gold, E., 1971. Pollution of the Sea and International law: A Canadian Perspective. *J. Mar. L. & Com.*, 3, p.13.
- Gollasch, S., 1997. Removal of Barriers to the Effective Implementation of Ballast Water Control and Management Measures in Developing Countries. Report of GEF/IMO/UNDP Project, IMO, London.
- Gollasch, S., David, M., Voigt, M., Dragsund, E., Hewitt, C. and Fukuyo, Y., 2007. Critical review of the IMO international convention on the management of ships' ballast water and sediments. *Harmful algae*, 6(4), pp.585-600.
- Gorycka, M., 2009. *Environmental risks of microplastics*. Stichting De Noordzee, Amsterdam, Netherland.
- Graneheim, U.H., Lindgren, B.M. and Lundman, B., 2017. Methodological challenges in qualitative content analysis: A discussion paper. *Nurse Education Today*.
- Gray, T.S. ed., 2016. *UK Environmental Policy in the 1990s*. Springer.
- Gregory, M.R., 2009. Environmental Implications of Plastic Debris in Marine Settings Entanglement, Ingestion, Smothering, Hangers-On, Hitch-Hiking and Alien Invasions. *Philosophical Transactions of The Royal Society of London B: Biological Sciences*, 364(1526), pp.2013-2025.
- Gupta, A.K., Gupta, S.K. and Patil, R.S., 2005. Environmental Management Plan for Port and Harbour Projects. *Clean Technologies and Environmental Policy*, 7(2), pp.133-141.
- Hassler, B., 2011. Accidental versus operational oil spills from shipping in the Baltic Sea: risk governance and management strategies. *AMBIO: A Journal of the Human Environment*, 40(2), pp.170-178.
- Hanlan, J.P., 2010. *Ship Generated Waste Disposal in The Wider Caribbean Region (Doctoral Dissertation, Worcester Polytechnic Institute)* pp 222-666.
- Hastings, E. and Potts, T., 2013. Marine Litter: Progress in Developing an Integrated Policy Approach in Scotland. *Marine Policy*, 42, pp.49-55.

- Hauch, V., Sporer, S.L., Masip, J. and Blandón-Gitlin, I., 2017. Can credibility criteria be assessed reliably? A meta-analysis of criteria-based content analysis.
- Heaver, T.D., 1995. The Implications of Increased Competition Among Ports for Port Policy and Management. *Maritime Policy and Management*, 22(2), pp.125-133.
- HELSINKI COMMISSION - Baltic Marine HELCOM 18/97 Environment Protection Commission Convention on the Protection of the Marine Environment of the Baltic Sea Area, 1992.
- Elenwo, E.I. and Akankali, J.A., 2015. The Effects of Marine Pollution on Nigerian Coastal Resources. *Journal of Sustainable Development Studies*, 8(1).
- Herbst, J., 2014. *States and Power in Africa: Comparative Lessons in Authority and Control*. Princeton University Press, p.56.
- Henry Ogbuagu, D., Chidiogo Okoli, G. and Asuenime Agbonikhena, N., 2013. Seaport-associated pollutions in Ogu waterway near Port Harcourt. *Management of Environmental Quality: An International Journal*, 24(4), pp.512-525.
- Hewell, V.M., Vasquez, A.R. and Rivkin, I.D., 2017. Systemic and individual factors in the buprenorphine treatment-seeking process: a qualitative study. *Substance abuse treatment, prevention, and policy*, 12(1), p.3.
- Hewitt, C.L., Gollasch, S. and Minchin, D., 2009. The vessel as a vector–biofouling, ballast water and sediments. In *Biological invasions in marine ecosystems* Springer, Berlin, Heidelberg. pp. 117-131.
- Hilaire, A., 2007. *An Analysis of Cruise Tourism in The Caribbean And Its Impact on Regional Destination Ports*.
- Hiranandani, V., 2014. Sustainable Development in Seaports: A Multi-Case Study. *WMU Journal of Maritime Affairs*, 13(1), pp.127-172.
- Hoyle, B.S., 1996. *Cityports, Coastal Zones and Regional Change. International Perspectives on Planning and Management*, (2nd edn 2002 Chichester, UK) pp.235-248.
- Huang, S.Y., Hsu, W.J., Fang, H. and Song, T., 2016. MTSS--A Marine Traffic Simulation System and Scenario Studies for a Major Hub Port. *ACM Transactions on Modeling and Computer Simulation (TOMACS)*, 27(1), p.3.
- Hutto, L.B., 2001. *A Comprehensive Guide to Shipboard Waste Management options*. In *OCEANS, 2001. MTS/IEEE Conference and Exhibition Vol. 1*, pp. 295-301.

- McDorman, T.L., 2000. Regional port state control agreements: some issues of international law. *Ocean & Coastal LJ*, 5, p.207.
- Ivshina, I.B., Kuyukina, M.S., Krivoruchko, A.V., Elkin, A.A., Makarov, S.O., Cunningham, C.J., Peshkur, T.A., Atlas, R.M. and Philp, J.C., 2015. Oil spill problems and sustainable response strategies through new technologies. *Environmental Science: Processes & Impacts*, 17(7), pp.1201-1219.
- Iwugo, K.O., D'Arcy, B. And Andoh, R., 2003, August. Aspects of Land-Based Pollution of An African Coastal Megacity of Lagos. In Diffuse Pollution Conference, Dublin. Vol. 14, Pp. 122-124.
- Jack, M.W., Coles, A.M. and Piterou, A., 2017. Sustainable Project Management In Urban Development Projects: A Case Study Of The Greater Port Harcourt City Development Project In Rivers State, Nigeria. *WIT Transactions on Ecology and the Environment*, 210, pp.209-219.
- Jagdeep S, Rafael L., Rajib S. and B. Frostell. Progress and Challenges to the Global Waste Management System; *Waste Management & Research*, vol. 32(9) (2014) pp. 800-812.
- Jaja, C.Y., 2011. Freight Traffic at Nigerian Seaports: Problems and Prospects. *Medwell Journals*, 6, pp.250-258.
- Jarzemskis, A. and Jarzemskiene, I., 2016. The Model to Assess the Implementation of Technical Conditions Defined in Annex IV of Marpol Convention 73/78: The Case of the Baltic Sea Port of Klaipeda. *Transport and Telecommunication Journal*, 17(4), pp.335-349.
- Jerome, O.U., 2011. "How Has the Nigerian Maritime Industry Performed in The Last 50 Years?" *Ships and Ports Weekly*, p.4.
- Ji, Z.G., 2017. Hydrodynamics and water quality: modeling rivers, lakes, and estuaries. John Wiley & Sons.
- Jin, A.T.K., 1997. The Regulation of Vessel-Source Marine Pollution: Reconciling the Maritime and Coastal State Interests. *Sing. J. Int'l & Comp. L.*, 1, p.355.
- John D and Sarah T., 2012 Sustainable Development of Maritime Operations in Ports. *Business Strategy and the Environment*, 21, pp. 111-126.
- Li, K.X. and Zheng, H., 2008. Enforcement of law by the Port State Control (PSC). *Maritime Policy & Management*, 35(1), pp.61-71.

- Jones, C., 2010. Exploring new ways of assessing the effect of regulation on environmental management. *Journal of Cleaner Production*, 18(13), pp.1229-1250.
- Joyner, C.C., 2000. The International Ocean Regime at the New Millennium: A Survey of the Contemporary Legal Order. *Ocean & Coastal Management*, 43(2), pp.163-203.
- Kaluza, P., Kölzsch, A., Gastner, M.T. and Blasius, B., 2010. The Complex Network of Global Cargo Ship movements. *Journal of the Royal Society Interface*, 7(48), pp.1093-1103.
- Kasoulides, G., 1990. Paris Memorandum of Understanding: a regional regime of enforcement. *Int'l J. Estuarine & Coastal L.*, 5, p.180.
- Kay, R. And Alder, J., 1998. *Coastal Planning and Management*. CRC Press.
- Kennish, M.J., 2002. Environmental Threats and Environmental Future of Estuaries. *Environmental Conservation*, 29(01), pp.78-107.
- Kern, J.M., 2016. Wreck Removal and the Nairobi Convention—a Movement Toward a Unified Framework. *Frontiers in Marine Science*, 3, p.11.
- Khalatbari, Y., Hermidas Bavand, D., Zare, A. and Poorhashemi, S.A., 2016. Development of the concept of “Environmental Damage” in International environmental law. *Caspian Journal of Environmental Sciences*, 14(4), pp.339-350.
- Kindt, J.W., 1984. Vessel-Source Pollution and the Law of the Sea. *Vand. J. Transant'l L.*, 17, p.287.
- Klein, N. and Rothwell, D.R., 2009. *Maritime Security and the Law of the Sea*. In *Maritime Security* Routledge. pp.48-62.
- Knapp, S. and Franses, P.H., 2007. A Global View on Port State Control: Econometric Analysis of the Differences Across Port State Control Regimes. *Maritime Policy & Management*, 34(5), pp.453-482.
- Knigge, L.G., 2017. Grounded Theory. *The International Encyclopedia of Geography*.
- Knudsen, O.F. and Hassler, B., 2011. IMO legislation and its Implementation: Accident Risk, Vessel Deficiencies and National Administrative Practices. *Marine Policy*, 35(2), pp.201-207.

- Kofele-Kale, N., 2016. The international law of responsibility for economic crimes: holding state officials individually liable for acts of fraudulent enrichment. Routledge.
- Kollikkathara, N., Feng, H. and Stern, E., 2009. A purview of waste management evolution: Special emphasis on USA. *Waste management*, 29(2), pp.974-985.
- König, D., 2000. Erik Jaap Molenaar, *Coastal State Jurisdiction over Vessel-Source Pollution* (The Hague: Kluwer Law International, 1998), 632 pages. *Yearbook of International Environmental Law*, 10(1), pp.823-826.
- Kopsick, D., 2011, June. Requirements for Effective Seaport Environmental Security: Collective Action at the Ports. In *Proceedings of the 9th International Conference on Environmental Compliance and Enforcement* pp. 20-24.
- Krstinić, D., Bingulac, N. and Dragojlović, J., 2017. CRIMINAL AND CIVIL LIABILITY FOR ENVIRONMENTAL DAMAGE. *Ekonomika Poljoprivrede*, 64(3), p.1161.
- Kuznetsov, A., Dinwoodie, J., Gibbs, D., Sansom, M. And Knowles, H., 2015. Towards A Sustainability Management System for Smaller Ports. *Marine Policy*, 54, Pp.59-68.
- Kothari, C.R., 2004. *Research methodology: Methods and techniques*. New Age International. Champ, M.A., 2003. Economic and environmental impacts on ports and harbors from the convention to ban harmful marine anti-fouling systems. *Marine pollution bulletin*, 46(8), pp.935-940.
- Kadafa, A.A., Zakaria, M.P. and Othman, F., 2012. Oil spillage and pollution in Nigeria: organizational management and institutional framework. *Journal of Environment and Earth Science*, 2(4), pp.22-30.
- Ladan, M.T., 2012. Review of NESREA act 2007 and regulations 2009-2011: a new Dawn in environmental compliance and enforcement in Nigeria. *Law Env't & Dev. J.*, 8, p.116.
- Lam, J.S.L. and Notteboom, T., 2014. The greening of ports: a comparison of port management tools used by leading ports in Asia and Europe. *Transport Reviews*, 34(2), pp.169-189.
- Lannelongue, G., Gonzalez-Benito, J., Gonzalez-Benito, O. and Gonzalez-Zapatero, C., 2015. Time compression diseconomies in environmental management: The effect of assimilation on environmental performance. *Journal of environmental management*, 147, pp.203-212.

- Leape, Jonathan, 2006 "The London Congestion Charge." *The Journal of Economic Perspectives*, pp. 157-176.
- Leavy, B., 1994. The craft of case-based qualitative research. *Irish Journal of Management*, 15, p.105.
- Lee, H.L. and Ling, L.P., 2015. Impact of Implementation of ISO 14001 Environmental Management Systems on Environmental Performance: A Case Study. *Engineering Research Science & Technology*, 4(1), pp.1-13.
- Leggate, H., McConville, J. and Morvillo, A. eds., 2004. *International Maritime Transport: Perspectives*. Routledge, pp. 222-333.
- Lentz, S.A. and Felleman, F., 2003, April. Oil Spill Prevention: A Proactive Approach. In *International Oil Spill Conference (Vol. 2003, No. 1,)*. American Petroleum Institute. pp. 3-27.
- Leung, L., 2015. Validity, reliability, and generalizability in qualitative research. *Journal of family medicine and primary care*, 4(3), p.324.
- Lewanski, R., 1992. Peter M. Haas, *Saving the Mediterranean*. The Politics of International Environmental Cooperation, Columbia University Press, New York, 1990, pp. 247. *Rivista Italiana di Scienza Politica*, 22(01), pp.167-169.
- Li, K.X. and Zheng, H., 2008. Enforcement of law by the Port State Control (PSC). *Maritime Policy & Management*, 35(1), pp.61-71.
- Lowe, A.V., 1974. The enforcement of marine pollution regulations. *San Diego L. Rev.*, 12, p.624.
- Liffmann, M. and Boogaerts, L., 1997. Linkages Between Land-Based Sources of Pollution and Marine Debris. In *Marine Debris*, Springer New York. pp. 359-366.
- Lipton, J., Özdemiroğlu, E., Chapman, D. and Peers, J. eds., 2018. *Equivalency Methods for Environmental Liability: Assessing Damage and Compensation Under the European Environmental Liability Directive*. Springer.
- Lopes, C., Antelo, L.T., Franco-Uría, A., Alonso, A.A. and Pérez-Martín, R., 2015. Valorisation of fish by-products against waste management treatments—Comparison of environmental impacts. *Waste management*, 46, pp.103-112.
- Lotilla, R.P.M., 1992. The Efficacy of the Anti-Pollution Legislation Provisions of the 1982 Law of the Sea Convention: A View from South East Asia. *International and Comparative Law Quarterly*, 41(01), pp.137-151.

- Lun, Y.V., Lai, K.H., Wong, C.W. and Cheng, T.C.E., 2015. Environmental governance mechanisms in shipping firms and their environmental performance. *Transportation Research Part E: Logistics and Transportation Review*, 78, pp.82-92.
- Lusher, A., 2015. Microplastics in the Marine Environment: Distribution, Interactions and Effects. In *Marine Anthropogenic litter* Springer International Publishing. pp. 245-307
- Ma, J. and Hipel, K.W., 2016. Exploring social dimensions of municipal solid waste management around the globe—A systematic literature review. *Waste Management*, 56, pp.3-12.
- MacKenzie, S., 2014. Laurentian and African Great Lakes-Different strategies in the fight against Invasive species. *Ind. Int'l & Comp. L. Rev.*, 24, p.93.
- Maheim Jr, B.S., 1988. Annex V of the MARPOL Convention: Will It Stop Marine Plastic Pollution, pp.71.
- Manap, N. and Voulvoulis, N., 2015. Environmental management for dredging sediments—The requirement of developing nations. *Journal of environmental management*, 147, pp.338-348.
- Merriam, S.B. and Tisdell, E.J., 2015. *Qualitative research: A guide to design and implementation*. John Wiley & Sons.
- Mavrotas, G., Gakis, N., Skoulaxinou, S., Katsouros, V. and Georgopoulou, E., 2015. Municipal Solid Waste Management and Energy Production: Consideration of External Cost Through Multi-Objective Optimization and Its Effect on Waste-To-Energy Solutions. *Renewable and Sustainable Energy Reviews*, 51, pp.1205-1222.
- McDorman, T.L., 1997. Port State enforcement: a comment on article 218 of the 1982 law of the sea convention. *J. Mar. L. & Com.*, 28, p.305.
- McDorman, T.L., 2000. Regional port state control agreements: some issues of international law. *Ocean & Coastal LJ*, 5, p.207.
- Molenaar, E.J., 2007. Port state jurisdiction: toward comprehensive, mandatory and global coverage. *Ocean Development & International Law*, 38(1-2), pp.225-257.
- Mayring, P., 2014. *Qualitative content analysis: theoretical foundation, basic procedures and software solution*.

- Mazrui, A., 2005. Shariacracy And Federal Models in The Era of Globalization: Nigeria In Comparative Perspective. *Democratic Institution Performance: Research and Policy Perspectives*, 63.
- Mbande, C., 2003. Appropriate Approach in Measuring Waste Generation, Composition and Density in Developing Areas. *Journal of The South African Institution of Civil Engineering= Joernaal Van Die Suid-Afrikaanse Instituut Van Siviele Ingenieurswese*, 45(3), pp.2-10.
- McDorman, T.L., 2000. Regional Port State Control Agreements: Some Issues of International Law. *Ocean & Coastal LJ*, 5, p.207.
- McDougall, F.R., White, P.R., Franke, M. and Hindle, P., 2008. *Integrated Solid Waste Management: A Life Cycle Inventory*. John Wiley & Sons.
- McGonigle, R. Michael, R., 1981. Michael McGonigle, and Mark W. Zacher. *Pollution, Politics, and International law: tankers at sea*, pp. 567
- McLeod, Fraser, and Tom Cherrett., 2011. Waste collection." *Waste A Handbook for Management*. Elsevier Inc., Burlington, pp. 61-76.
- Merriam, S.B. and Tisdell, E.J., 2015. *Qualitative research: A guide to design and implementation*. John Wiley & Sons.
- Mfon Ekong Usoro. Port State Control: A tool for Sustainable Management of Maritime Safety and Marine Environment. A Paper Delivered at Maritime Women: Global Leadership International Conference on the 31st -1st April 2014.
- Miller, D.G., Sabourenkov, E.N. and Ramm, D.C., 2004. Managing Antarctic Marine Living Resources: the CCAMLR Approach. *The International Journal of Marine and Coastal Law*, 19(3), pp.317-363.
- Miller, W.L. and Crabtree, B.F., 1992. Primary care research: A multimethod typology and qualitative road map.
- Mizzi, M., 2004. An Assessment of The Level of Understanding Regarding Issues of Marine Pollution Regulations in Respect of Waste Management (Annex V) In the Port Of Port Elizabeth. North-West University, pp.145.
- Moglia, F. and Sanguineri, M., 2003. Port Planning: The Need for a New Approach? *Maritime Economics & Logistics*, 5(4), pp.413-425. See also, Brooks, M.R., 2004. The governance Structure of Ports. *Review of Network Economics*, 3(2).

- Mohee, R., Surroop, D., Mudhoo, A. And Rughooputh, B.K., 2012. Inventory of Waste Streams in An Industrial Port and Planning for A Port Waste Management System as Per ISO14001. *Ocean & Coastal Management*, 61, pp.10-19.
- Molenaar, E., 1998. *Coastal State Jurisdiction Over Vessel-Source Pollution (Vol. 51)*. Kluwer Law International.
- Molenaar, E.J. and Pons, B., 1996. The EC Directive on Port State Control in Context. *The International Journal of Marine and Coastal Law*, 11(2), pp.241-288.
- Molenaar, E.J., 2007. Port State Jurisdiction: Toward Comprehensive, Mandatory and Global Coverage. *Ocean Development & International Law*, 38(1-2), pp.225-257.
- Morey, S., Steven, A. and Pearson, P., 2017. Co constructing A Complex Narrative Using Constructivist Grounded Theory. *International Journal of Qualitative Methods*, 16(1), p.14.
- Morse, J.M., 2015. Critical analysis of strategies for determining rigor in qualitative inquiry. *Qualitative health research*, 25(9), pp.1212-1222.
- Myers, M.D., 1997. Qualitative Research in Information Systems. *Management Information Systems Quarterly*, 21(2), pp.241-242.
- Ndikom, O., 2008. *Maritime Transport: Management and Administration in Nigeria*. Bunmico Publishers.
- Ndikom, O.B., 2013. An Appraisal of The Operational Limitations of The Private Terminal Concessionaires in Landlord Port Model. *Continental Journal of Social Sciences*, 6(1), p.9.
- Neuendorf, K.A., 2016. *The content analysis guidebook*. Sage.
- Neuman, W.L., 2016. *Understanding research*. Pearson.
- Neumann, T. ed., 2013. *Marine Navigation and Safety of Sea Transportation: STCW, Maritime Education and Training (MET), Human Resources and Crew Manning, Maritime Policy, Logistics and Economic Matters*.
- Ng, A.K. and Song, S., 2010. The Environmental Impacts of Pollutants Generated by Routine Shipping Operations on Ports. *Ocean & Coastal Management*, 53(5), pp.301-311.
- Nickens, A.D., Pizzino, J.F. and Crane, C.H., 1997. Environmental Compliance: Requirements and Technology Opportunities for Future Ships. *Naval engineers journal*, 109(3), pp.349-369.

- Butt, N. 2007. The impact of Cruise Ship Generated Waste on Home Ports and Ports of Call: A Study of Southampton. *Marine Policy* 31 (2007), pp. 591-598.
- Nishtala, V., Davis, M.G., Bracken, R.L. and Hine, R.M., CR Bard Inc, 2016. Waste management system. U.S. Patent 9,463,110.
- Noble, B. and Nwanekezie, K., 2017. Conceptualising strategic environmental assessment: Principles, approaches and research directions. *Environmental Impact Assessment Review*, 62, pp.165-173.
- Noble, H. and Smith, J., 2015. Issues of validity and reliability in qualitative research. *Evidence-Based Nursing*, pp. ebnurs-2015.
- Nor, N.H.M. and Obbard, J.P., 2014. Microplastics in Singapore's Coastal Mangrove Ecosystems. *Marine Pollution Bulletin*, 79(1), pp.278-283.
- Notteboom*, T.E. and Rodrigue, J.P., 2005. Port Regionalization: Towards a New Phase in Port Development. *Maritime Policy & Management*, 32(3), pp.297-313.
- Nwanosike, F., 2014. Evaluation of Nigerian Ports Post-Concession Performance (Doctoral Dissertation, University of Huddersfield).
- Nwufo, C., 2010. Legal Framework for the Regulation of Waste in Nigeria. *African Research Review*, 4(2).
- Obed, B. and Emeghara, G.C., 2012. A Critical Appraisal of Port Reform and Development Policy in Nigeria. *Research in Business and Management*, 1(1), pp.13-22.
- O'Brien, C.E., Johnston, M.W. and Kerstetter, D.W., 2017. Ports and pests: Assessing the threat of aquatic invasive species introduced by maritime shipping activity in Cuba. *Marine pollution bulletin*, 125(1-2), pp.92-102.
- Odey, Stephen Adi., 2015. Role of the Legislators in Environmental Governance in Nigeria. *IJHSSE* 2, (3), pp. 71-74.
- Oghojafor, B.E., Kuye, O.L. and Alaneme, G.C., 2012. Concession as a Strategic tool for Ports Efficiency: An Assessment of the Nigerian Ports. *American Journal of Business and Management*, 1(4), pp.214-222.
- Øhlenschläger, J.P., Newman, S. and Farmer, A., 2013. Reducing Ship Generated Marine Litter—Recommendations to Improve the EU Port Reception Facilities

- Directive. Report Produced for Seas at Risk. United Kingdom: Institute for European Environmental Policy.
- Okon, E.E., 2003. The Environmental Perspective in the 1999 Nigerian Constitution. *Environmental Law Review*, 5(4), pp.256-278.
- Oxman, B.H., 1988. Jurisdiction of states. In *Encyclopedia of Disputes Installment* 10, pp. 277-283.
- Oliveira, F., Monteiro, P., Bentes, L., Henriques, N.S., Aguilar, R. and Gonçalves, J.M., 2015. Marine litter in the upper São Vicente submarine canyon (SW Portugal): Abundance, Distribution, Composition and Fauna Interactions. *Marine Pollution Bulletin*, 97(1), pp.401-407.
- Olokesusi, F., 1998. Legal and Institutional Framework of Environmental Impact Assessment in Nigeria: An Initial Assessment. *Environmental Impact Assessment Review*, 18(2), pp.159-174.
- Onwuegbuchunam, D.E., Ebe, T.E., Okoroji, L.I. and Essien, A.E., 2017. An Analysis of Ship-Source Marine Pollution in Nigeria Seaports. *Journal of Marine Science and Engineering*, 5(3), p.39.
- Olson, P.H., 1994. Handling of Waste in Ports. *Marine Pollution Bulletin*, 29(6-12), pp.284-295.
- Olukoju, A., 2003. Maritime Policy and Economic Development: A Comparison of Nigerian and Japanese experiences since the Second World War. *Afrika Zamani*, (11&12), pp.160-182.
- Olukoju, A., 2008. Port Development and Modernisation on the West African Atlantic Coast in the Twentieth century. *Coloquios de Historia Canario Americana*, 18(18), pp.1192-1198.
- Olukoju, A., 2014. The Port of Lagos, 1850–1929: The Rise of West Africa’s Leading Seaport. In *Atlantic Ports and The First Globalisation, C. 1850–1930* Palgrave Macmillan UK.pp112-129.
- Omo-Ebah, O., 2012. Maritime Law Reforms: The Interface between International Law and Nigerian Law. *IJLDLR*, 1, p.175.
- O’neill, K., 2017. *The environment and international relations*. Cambridge University Press.

- Onwuegbuchunam, D.E., Ebe, T.E., Okoroji, L.I. and Essien, A.E., 2017. An Analysis of Ship-Source Marine Pollution in Nigeria Seaports. *Journal of Marine Science and Engineering*, 5(3), p.39.
- ONYEMA, Henry Kelechi, OBINNA, Polycarp, EMENYONU, Uchenna Martin, EMEGHARA Godfrey Chigozie., 2015. The Impact of Port Congestion on The Nigerian Economy *International Journal of Scientific Research and Management (IJSRM)* Volume 3 Issue 7 Pages 3431-3437 Website: www.ijsrm.in ISSN (e): pp. 2321-3418
- Onyemechi, C., 2015. Benefit maximizing criteria from the Nigerian Coastal and Inland Shipping Cabotage Policy. *Revista de Gestão Costeira Integrada-Journal of Integrated Coastal Zone Management*, 15(3).
- Orji, O. Goodhope, 2014. The Role of Effective Ports Management in Facilitating International Trade in Nigeria. *European Journal of Business and Management* 6, (13), pp. 204-215.
- ¹Orji, U.J., 2012. Applying E-Maritime Initiatives to Enhance Productivity in the Nigerian Maritime Industry: The Need for an Enabling Policy and Legal Environment. *Bus. L. Rev.*, 33, p.262.
- Osaretin, P.A., 2007. Efficient Port Operations and The Benefits of Actors-A Case Study of Tin Can Island Port, Nigeria. Rapport Nr.: Master Thesis 2006: 75.
- Osborn, D., 1997. Some reflections on UK environmental policy, 1970-1995. *J. Env'tl. L.*, 9, p.3.
- Owens, S., 2012. Experts and the Environment—the UK Royal Commission on Environmental Pollution 1970–2011. *Journal of Environmental Law*, 24(1), pp.1-22.
- Oxman, B. H.1980. "The Third United Nations Conference on the Law of the Sea: The Ninth Session (1980)." *American Journal of International Law* (1981): pp. 211-256.
- Paipai, E., 1999 "Guidelines for Port Environmental Management." pp.22.
- Paixao, A.C. and Bernard Marlow, P., 2003. Fourth Generation Ports a Question of Agility. *International Journal of Physical Distribution & Logistics Management*, 33(4), pp.355-376.

- Pallis, A.A., Papachristou, A.A. and Platias, C., 2017. Environmental policies and practices in Cruise Ports: Waste reception facilities in the Med. SPOUDAI- Journal of Economics and Business, 67(1), pp.54-70.
- Pálsson, G., Harding, A. And Raballand, G., 2007. Port and Maritime Transport Challenges in West and Central Africa. Sub-Saharan Africa Transport Policy Program (Ssatp) Working Paper, 84, p.11.
- Paris, M.O.U., 2012. Paris Memorandum of Understanding on Port State Control including 34th amendment.
- Parsons, Michael G., and Richard W. Harkins., 2002 "Full-scale Particle Removal Performance of Three Types of Mechanical Separation Devices for the Primary Treatment of Ballast Water. Marine Technology, 39. (4), pp. 211-222.
- Payoyo, P.B., 1994. Implementation of international Conventions Through Port State Control: An Assessment. Marine Policy, 18(5), pp.379-392.
- Peet, G., 1992. The MARPOL Convention: Implementation and Effectiveness. Int'l J. Estuarine & Coastal L., 7, p.277.
- Per H. Olson. Handling of Waste in Port; Marine Pollution Bulletin, Vol. 29, No. 6-12, (1994), pp. 284-295.
- Peris-Mora, E., Orejas, J.D., Subirats, A., Ibáñez, S. and Alvarez, P., 2005. Development of a system of indicators for sustainable port management. Marine Pollution Bulletin, 50(12), pp.1649-1660.
- Peter W. D and Michael N. Nijdam.2008 Charging System for Waste Reception Facilities in Port and the Level Playing Field: A Case from North-West Europe. Coastal Management, Vol. 36 pp. 109-124.
- Pinder, D. and Slack B., 2004 "Contemporary Contexts for Shipping and Ports." in Shipping and Ports in the Twenty-First Century: Globalization, Technological Change and the Environment. New York: Routledge, pp. 1-22.
- Pinder, D. and Slack, B. eds., 2000. Shipping and Ports in the Twenty-first Century. Routledge.
- Plant, G., 1994. Safer ships and cleaner seas: A Review Article on the Report of Lord Donaldson's Inquiry into the Prevention of Pollution from Merchant Shipping. Int'l J. Marine & Coastal L., 9, p.535.
- Polglaze, J., 2003. Can we Always Ignore Ship-Generated Food Waste? Marine Pollution Bulletin, 46(1), pp.33-38.

- Pollution from Ships (MARPOL), done. 17,1978,17 I.L.M. 546 (entered into force Oct. 2, 1983).
- Poo, K.M., Son, E.B., Chang, J.S., Ren, X., Choi, Y.J. and Chae, K.J., 2018. Biochars derived from wasted marine macro-algae (*Saccharina japonica* and *Sargassum fusiforme*) and their potential for heavy metal removal in aqueous solution. *Journal of environmental management*, 206, pp.364-372.
- Potts, Tavis, Emma Jackson, Daryl Burdon, Justine Saunders, Jonathan Atkins, Emily Hastings, and Olivia Langmead.,2013. Marine Protected Areas and Ecosystem Services–Linking Conservation and Human Welfare. Unpublished report of the NERC-funded Valuing Nature Network, pp. 45.
- Presburger-Ulniković, V., Vukić, M., Jančić-Heinemann, R. and Antonović, D., 2011. Ship Waste Quantities Prediction Model for the Port of Belgrade. *Chemical Industry and Chemical Engineering Quarterly/CICEQ*, 17(2), pp.239-248.
- Protocol of 1978 Relating to the International Convention for the Prevention of
- Psaraftis, H.N., 2005. EU Ports Policy: Where Do We Go from Here? *Maritime Economics & Logistics*, 7(1), pp.73-82.
- Puig, M., Wooldridge, C. and Darbra, R.M., 2014. Identification and selection of environmental performance indicators for sustainable port development. *Marine pollution bulletin*, 81(1), pp.124-130.
- Puig, M., Wooldridge, C., Casal, J. and Darbra, R.M., 2015. Tool for the identification and assessment of environmental aspects in ports (TEAP). *Ocean & Coastal Management*, 113, pp.8-17.
- Puig, M., Wooldridge, C., Michail, A. and Darbra, R.M., 2015. Current status and trends of the environmental performance in European ports. *Environmental Science & Policy*, 48, pp.57-66.
- Rafeeqi, S.F.A., Lodi, S.H., Khan, R.A. and Zafar, N.S., 2010. An adaptive monitoring model for the ageing assessment of concrete containment vessel. *NED University Journal of Research*, 7(1), pp.55-63.
- Rakestraw, A., 2012. Open oceans and marine debris: solutions for the ineffective enforcement of MARPOL Annex V. *Hastings Int'l & Comp. L. Rev.*, 35, p.383.
- Ram, N., Brinberg, M., Pincus, A.L. and Conroy, D.E., 2017. The questionable ecological validity of ecological momentary assessment: Considerations for design and analysis. *Research in Human Development*, 14(3), pp.253-270.

- Reinhard, A.J., de Blaeij, A.T., Bogaardt, M.J., Gaaff, A., Leopold, M.F., Scholl, M.M., Slijkerman, D.M.E., Strietman, W.J. and van der Wielen, P., 2012. Cost-Effectiveness and Cost-Benefit Analysis for the MSFD. LEI, Part of Wageningen UR.
- Ribeiro, M.C.D.C.M., 2015. Maritime safety and environmental protection in Europe: multiple layers in regulation and compliance.
- Ringbom, H., 1999. Preventing Pollution from Ships—Reflections on the Adequacy of Existing Rules. *Review of European, Comparative & International Environmental Law*, 8(1), pp.21-28.
- Roberts, O.I. and Okereke, C.I., 2017. Cultural beliefs on waste and the need for integration into present domestic waste management: Evidence from selected communities in Rives state, Nigeria. *International Journal of Social Science & Management Research*, 3(6), pp.1-12.
- Robinson, N.A., 2017. Environmental regulation of real property. Law Journal Press.
- Rodrigues, Sonia Morais, Et Al., 2009 "A Review of Regulatory Decisions for Environmental Protection: Part I—Challenges in The Implementation of National Soil Policies." *Environment International* 35. (1), pp. 202-213.
- Rucevska, I., Nelleman, C., Isarin, N., Yang, W., Liu, N., Yu, K., Sandnaes, S., Olley, K., McCann, H., Devia, L. and Bisschop, L., 2015. Waste Crime—Waste Risks: Gaps in Meeting the Global Waste Challenge.
- Ryan, P.G., Moore, C.J., Van Franeker, J.A. And Moloney, C.L., 2009. Monitoring the Abundance of Plastic Debris in The Marine Environment. *Philosophical Transactions of The Royal Society of London B: Biological Sciences*, 364(1526), pp.1999-2012.
- Sadri, S.S. and Thompson, R.C., 2014. On the Quantity and Composition of Floating Plastic Debris Entering and leaving the Tamar Estuary, Southwest England. *Marine Pollution Bulletin*, 81(1), pp.55-60.
- Sagoff, M., 1997. Why saves the seas. *Saving the Seas, Values, Scientists, and International Governance*. College Park, MD: Maryland Sea Grant College, p.23.
- Salomon, M., 2009. Recent European Initiatives in Marine Protection Policy: Towards Lasting Protection for Europe's Sea. *Environmental Science & Policy*, 12(3), pp.359-366.

- Porter, M.E. and Van der Linde, C., 1995. Toward a new conception of the environment-competitiveness relationship. *Journal of economic perspectives*, 9(4), pp.97-118.
- Sands, P. and Peel, J., 2012. *Principles of international environmental law*. Cambridge University Press.
- Sands, P., 2016. Climate Change and the Rule of Law: Adjudicating the Future in International Law. *Journal of Environmental Law*, 28(1), pp.19-35.
- Saunders, M.N. And Lewis, P., 2012. *Doing Research in Business & Management: An Essential Guide to Planning Your Project*. Pearson.
- Schachter, O. and Serwer, D., 1971. Marine Pollution Problems and Remedies. *The American Journal of International Law*, 65(1), pp.84-111.
- Schreier, M., 2014. Qualitative content analysis. *The SAGE handbook of qualitative data analysis*, pp.170-183.
- Seguí, X., Puig, M., Quintieri, E., Wooldridge, C. and Darbra, R.M., 2016. New environmental performance baseline for inland ports: a benchmark for the European inland port sector. *Environmental Science & Policy*, 58, pp.29-40.
- Sekaran, U. and Bougie, R., 2016. *Research methods for business: A skill building approach*. John Wiley & Sons.
- Sheavly, S.B. and Register, K.M., 2007. Marine Debris & Plastics: Environmental Concerns, Sources, Impacts and Solutions. *Journal of Polymers and the Environment*, 15(4), pp.301-305.
- Sheavly, S.B. And Register, K.M., 2007. Marine Debris & Plastics: Environmental Concerns, Sources, Impacts and Solutions. *Journal of Polymers and The Environment*, 15(4), pp.301-305.
- Shneerson, D., 1981. Investment in Port Systems: A Case Study of The Nigerian Ports. *Journal of Transport Economics and Policy*, pp.201-216.
- Simmonds, K.R., 1985. The status of the United Nations Convention on the Law of the Sea 1982; *International and Comparative Law Quarterly/ Volume 43, No. 2*, (1985), pp. 359-368.
- Siung-Chang, A., 1997. A Review of Marine Pollution Issues in The Caribbean. *Environmental Geochemistry and Health*, 19(2), pp.45-55.
- Smith, H.D. and Lalwani, C.S., 1999. The Call of the Sea: The Marine Knowledge Industry in the UK. *Marine Policy*, 23(4-5), pp.397-412.

- Smith, H.D. and Potts, J., 2005. *Managing Britain's Marine and Coastal Environment: Towards a Sustainable Future* (Vol. 10). Psychology Press, pp.2-68.
- Smith, Leigh, and Peter Ball., 2012 "Steps Towards Sustainable Manufacturing through Modelling Material, Energy and Waste Flows." *International Journal of Production Economics* 140(1) pp. 227-238.
- Soltani, A., Hewage, K., Reza, B. and Sadiq, R., 2015. Multiple stakeholders in multi-criteria decision-making in the context of municipal solid waste management: a review. *Waste Management*, 35, pp.318-328.
- Sorsa, M.A., Kiikkala, I. and Åstedt-Kurki, P., 2015. Bracketing as a skill in conducting unstructured qualitative interviews. *Nurse researcher*, 22(4), pp.8-12.
- Subramanian, N. and Gunasekaran, A., 2015. Cleaner Supply-Chain Management Practices for Twenty-First-Century Organizational Competitiveness: Practice-Performance Framework and Research Propositions. *International Journal of Production Economics*, 164, pp.216-233.
- Strauss, A. and Corbin, J., 1994. Grounded theory methodology. *Handbook of qualitative research*, 17, pp.273-285.
- Sampson, H., Bloor, M., Baker, S. and Dahlgren, K., 2016. Greener shipping? A consideration of the issues associated with the introduction of emission control areas. *Maritime Policy & Management*, 43(3), pp.295-308.
- Sustainability in Seaports: Managerial Accounting Instruments and Training for Competitive Green Ports beyond the Regulations. *Sustainability*, 10(3), p.783.
- Kadafa, A.A., Zakaria, M.P. and Othman, F., 2012. Oil spillage and pollution in Nigeria: organizational management and institutional framework. *Journal of Environment and Earth Science*, 2(4), pp.22-30.
- Keselj, T., 1999. Port State jurisdiction in respect of pollution from ships: the 1982 United Nations convention on the law of the sea and the memoranda of understanding. *ocean development & international law*, 30(2), pp.127-160.
- Tan, A.K.J., 2005. *Vessel-Source Marine Pollution: The Law and Politics of International Regulation* (Vol. 45). Cambridge University Press.
- Tan, S.T., Lee, C.T., Hashim, H., Ho, W.S. and Lim, J.S., 2014. Optimal process network for municipal solid waste management in Iskandar Malaysia. *Journal of Cleaner Production*, 71, pp.48-58.

- Taylor, S.J., Bogdan, R. and DeVault, M., 2015. Introduction to qualitative research methods: A guidebook and resource. John Wiley & Sons.
- Tetley, W., 1999. Uniformity of international private maritime law-the pros, cons, and alternatives to international conventions-how to adopt an international convention. *Tul. Mar. LJ*, 24, p.775.
- Thompson, R.C., La Belle, B.E., Bouwman, H. And Neretin, L., 2011. Marine Debris: Defining A Global Environmental Challenge. Unep Science and Technical Advisory Panel (Stap). Advisory Document.
- Tilman, D., 2000. Causes, consequences and ethics of biodiversity. *Nature*, 405(6783), p.208.
- Tomkins, K., 2004. Police, law enforcement and the environment. *Current Issues Crim. Just.*, 16, p.294.
- Trivedi, A., Singh, A. and Chauhan, A., 2015. Analysis of key factors for waste management in humanitarian response: An interpretive structural modelling approach. *International Journal of Disaster Risk Reduction*, 14, pp.527-535.
- Trozzi, C. And Vaccaro, R., 2000. Environmental Impact of Port Activities. *WIT Transactions on The Built Environment*, p. 51.
- Ulnikovic, V.P., Vukic, M. and Nikolic, R., 2012. Assessment of Vessel-Generated Waste Quantities on the Inland Waterways of the Republic of Serbia. *Journal of Environmental Management*, 97, pp.97-101.
- United Nations Convention on the Law of the Sea III, 1982.
- United Nations Convention on the Law of the Sea, art. 237, U.N. Doc. A/Conf.62/22 (1982), reprinted in
- Usono, M.E. and General, S., 2014. Port state control: a tool for sustainable management of maritime safety and marine environment. In *Proceedings of Maritime Women: Global Leadership International Conference (Vol. 1)*.
- Vaismoradi, M., Jones, J., Turunen, H. and Snelgrove, S., 2016. Theme development in qualitative content analysis and thematic analysis. *Journal of Nursing Education and Practice*, 6(5), p.100.
- van Dyck, G.K., 2015. Assessment of Port Efficiency in West Africa Using Data Envelopment Analysis. *American Journal of Industrial and Business Management*, 5(04), p.208.

- Van Franeker, J.A., 2010. Fulmar Litter Ecoqo Monitoring in The Netherlands 1979-2008 In Relation to Eu Directive 200/59/EC On Port Reception Facilities (No. C027/10).
- Van Teijlingen, E.R. And Hundley, V., 2001. The Importance of Pilot Studies. See Also Van Teijlingen, E. And Hundley, V., 2002. The Importance of Pilot Studies. *Nursing Standard*, 16(40), pp.33-36.
- Vélez-Agosto, N.M., Soto-Crespo, J.G., Vizcarrondo-Oppenheimer, M., Vega-Molina, S. and García Coll, C., 2017. Bronfenbrenner's bioecological theory revision: Moving culture from the macro into the micro. *Perspectives on Psychological Science*, 12(5), pp.900-910.
- Vengosh, A., Jackson, R.B., Warner, N., Darrah, T.H. and Kondash, A., 2014. A critical review of the risks to water resources from unconventional shale gas development and hydraulic fracturing in the United States. *Environmental science & technology*, 48(15), pp.8334-8348.
- Versteeg, H.A., 1976. The International and National Response to the Problems of Marine Pollution. *Auckland UL Rev.*, 3, p.209.
- Victor, D.G., Raustiala, K. And Skolnikoff, E.B. Eds., 1998. *The Implementation and Effectiveness of International Environmental Commitments: Theory and Practice*. MIT Press.
- Vogt, C., Peck, E. and Hartman, G., 2018. Dredging for Navigation, for Environmental Cleanup, and for Sand/Aggregates. In *Handbook on Marine Environment Protection*, pp. 189-213.
- Von Glahn, G. and Taulbee, J.L., 2015. *Law among nations: an introduction to public international law*. Routledge.
- Vuorinen, I., Hänninen, J., Rajasilta, M., Laine, P., Eklund, J., Montesino-Pouzols, F., Corona, F., Junker, K., Meier, H.M. and Dippner, J.W., 2015. Scenario simulations of future salinity and ecological consequences in the Baltic Sea and adjacent North Sea areas—implications for environmental monitoring. *Ecological indicators*, 50, pp.196-205.
- Wade, B.A., 1997. The Challenges of Ship-Generated Garbage in the Caribbean. In *Marine Debris* (pp. 229-237).
- Welman, J.C. And Kruger, S.J., 1999. *Research Methodology for The Business and Administrative Sciences*. Johannesburg, South Africa: International Thompson.

- White, B. (2011). Private Perceptions, Public Reflections: Aesthetic Encounters as Vehicles for Shared Meaning Making. *International Journal of Education & The Arts*, 12(2), pp.1-24.
- Whittemore, R., Chase, S.K. And Mandle, C.L., 2001. Validity in Qualitative Research. *Qualitative Health Research*, 11(4), pp.522-537.
- Williams, J.O. and Hakam, K., 2016. Microorganisms associated with dump sites in Port Harcourt Metropolis, Nigeria. *Journal of Ecology and The Natural Environment*, 8(2), pp.9-12.
- Willig, C., 2017. Interpretation in Qualitative Research. *The SAGE Handbook of Qualitative Research in Psychology*, p.274.
- Wilson, V., 2016. Research methods: Content analysis. *Evidence Based Library and Information Practice*, 11(1 (S)), pp.41-43.
- Wooldridge, C. and Stojanovic, T., 2000. 10 Integrated Environmental Management of Ports and Harbours. *Shipping and Ports in the Twenty-first Century*, p.191.
- Wooldridge, C.F., McMullen, C. and Howe, V., 1999. Environmental Management of Ports and Harbours Implementation of Policy through Scientific Monitoring. *Marine Policy*, 23(4-5), pp.413-425.
- Wooldridge, Chris, and Tim Stojanovic., 2004 "10 Integrated Environmental Management of Ports and Harbours." *Shipping and Ports in the Twenty-first Century*, pp. 191.
- Wright, A.N., 2007. Beyond the Sea and Spector: Reconciling Port and Flag State Control Over Cruise Ship Onboard Environmental Procedures and Policies. *Duke Env'tl. L. & Pol'y F.*, 18, p.215.
- Wright, S.L., Thompson, R.C. and Galloway, T.S., 2013. The Physical Impacts of Microplastics on Marine Organisms: a review. *Environmental Pollution*, 178, pp.483-492.
- Wilson, J.S., Mann, C.L. and Otsuki, T., 2003. Trade facilitation and economic development: A new approach to quantifying the impact. *The World Bank Economic Review*, 17(3), pp.367-389.
- Wu, C.C., 2016. *Towards an African-Focused Ecocriticism: The Case of Nigeria*. University of Nevada, Reno.
- Watters, J.K. and Biernacki, P., 1989. Targeted sampling: options for the study of hidden populations. *Social problems*, 36(4), pp.416-430.

Yao, Q. and Xu, L., 2015, April. Strategies on Prevention of Pollution from Rotary-Molded Boat of the Marine Environment. In 2015 International Conference on Automation, Mechanical Control and Computational Engineering. Atlantis Press.

Zhelev, T.K. and Bhaw, N., 2000. Combined water–oxygen pinch analysis for better wastewater treatment management. *Waste management*, 20(8), pp.665-670.

Zonn, I.S. and Kostianoy, A.G., 2015. Environmental Risks in Production and Transportation of Hydrocarbons in the Caspian–Black Sea Region. In *Oil and Gas Pipelines in the Black-Caspian Seas Region*, pp. 211-223.

Appendix 1: MARPOL Regulations Relating to Reception Facilities

Annex	Category of waste	Annex in force	Reception facilities required	Types of waste for reception
I	Oil	2 Oct 1983	✓	Covers all types of wastes from the carriage of oil, as fuel, engine room slops, cargo (tank washings) or dirty ballast water
II	Noxious liquid substances in bulk	6 April 1987	✓	Chemical wastes derived from bulk chemical transportation, including residues and mixtures containing noxious substances
III	Harmful substances carried by sea in packaged form	1 July 1992	X When annex comes into force	-
IV	Sewage from ships	X	✓	Raw sewage - retained in holding tanks for disposal in port or outside 12 nm; partially treated sewage -retained in holding tanks for disposal in port or outside 4 nm
V	Garbage from ships	31 December 1998	✓	Garbage includes domestic (food and packaging) and operational (maintenance, cargo and miscellaneous) wastes
VI	Air pollution from ships	X	X	-

Appendix 2: Interview Consent Documents

Consent Letter

TITLE OF STUDY

THE LEGAL REGULATION OF WASTE MANAGEMENT IN THE UK AND NIGERIA:
COMPARATIVE ANALYSIS ON PORT OF SOUTHAMPTON AND APAPA PORT
LAGOS.

Dear Participant,

I invite you to participate in a research study entitled: THE LEGAL REGULATION OF PORT WASTE MANAGEMENT. I am currently researcher with the University of Central Lancashire and am in the process of writing my thesis. The purpose of the research is to determine: the level of compliance with the legal regulations of waste management at the ports and causes of ineffective port waste management. Your participation in this research project is completely voluntary. You may decline altogether or decline any questions you don't wish to answer. There are no known risks to participation beyond those encountered in everyday life. Your responses will remain confidential and anonymous. Data from this research will be kept under lock and key and reported only as a collective combined total. No one other than the researcher's will know your individual answers to the interview questions.

If you agree to participate in this project, the interview should not be more than 30 to 45 minutes to answer the questions with regards to above research title as best you can. In the final analysis of data in this study, the researcher undertake that every data collected will be anonymized in the study. Hence, your participation and identity will not be noticeable in any way nor your organization in the study. By doing this, individuals identity and contributions to the study will be adequately secured with due regards to Data Protection Act.

If you have any questions about this project, feel free to contact the researcher +447574082627.

Thank you for your assistance in this important endeavor.

Sincerely yours,

Oluwatosin S. Osaloni

Position: Lancashire Law School, University of Central Lancashire

Postcode: PR1 2HE

Tel No

07575082627

E-mail address

ososaloni@uclan.ac.uk

_____	_____	_____
Name of Participant	Date	Signature
Oluwatosin S. Osaloni		
_____	_____	_____
Name of Researcher	Date	Signature

Consent Form

FULL TITLE OF PROJECT: *THE LEGAL REGULATION OF WASTE MANAGEMENT IN THE UK AND NIGERIA: COMPARATIVE ANALYSIS ON PORT OF SOUTHAMPTON AND APAPA PORT LAGOS.*

Name: *Oluwatosin S. Osaloni*

Position: *Lancashire Law School, University of Central Lancashire*

Correspondence Address

Postcode: *PR1 2HE*

Tel No

07550669903

E-mail address

ososaloni@uclan.ac.uk

Please read the following statements and initiate in the boxes to indicate your agreement

Please tick box

I confirm that I have read and understand the information sheet, dated for the above study and have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason.

I agree to take part in the above study.

I agree that my data gathered in this study may be stored (after it has been anonymised) in a specialist data centre and may be used for future research.

I understand that it will not be possible to withdraw my data from the study after final analysis has been undertaken.

I agree to the interview / focus group / consultation being audio recorded

I agree to the interview / focus group / consultation being video recorded

I agree to the use of anonymised quotes in publications

In the event I have any further question to ask, you can contact the researcher on the number +447574082627

Name of Participant	Date	Signature
---------------------	------	-----------

Oluwatosin S. Osaloni

Name of Researcher	Date	Signature
--------------------	------	-----------

Appendix 3: Interview Questions

INTERVIEW SCHEDULE FOR PORT OFFICIALS BOTH IN THE UK AND NIGERIA

Interview question 1: How effective is the legal regulations of waste management in the UK and Nigeria port in reducing waste at the port?

Interview guide:

- What does your department do?
- What is the take of the port on port in waste management?
- How familiar are you with the legal framework on port waste management?
- What is your view about the existing legal regulations of port waste management?
- Can you tell me some of the legal framework guiding your responsibility at the port?
- Do you think the law is too old or cumbersome to address port waste?
- Do you think the legal regulations have brought much desire change that you seem to have anticipated?
- How do you think the legal regulations on port waste management could better improve in enhancing waste management at the port?
- Have had any conflict with legal regulations in the implementation process with the national or regional laws?
- What is the mode of implementation of the legal regulations at the port?
- Are there penalties put in place to for inappropriate waste management by the ship-owners?
- Finally, what is your view about the national laws in implementing vis-à-vis global and regional legal framework?

Interview question 2: What is the impact of ship-generated waste within the ports and on the ports host community?

- What do you do as an individual in your department in port waste monitoring?
- At what stage do you get licensed waste collectors agents involved in the process of waste evacuation at the port?
- How do you monitor shipping activities within the port to avoid waste dropping?
- Do you have any impact or incidence of unmanaged waste at the port in the past?
- Have there been any side effect of unmanaged wastes to the socio-economic development of the ports and its environs?
- What are the challenges that you faced with while dealing with waste at the port?
- How endemic is the impact of unmanaged waste at the port?
- Can port completely get rid of unmanaged port waste?
- How do you think these challenges can be minimized?

Interview question 3: What is impact the of waste reception facilities towards waste reduction and ship-generated waste at the port?

- How do you think, in your assessment the laws and regulations have been fared in reducing waste at the port?
- What are the strategies designed by your port with a view to eradicate within the port?
- How effective is the strategies or is the strategies producing results?
- How would you assess the response of port management and government policy towards waste management at your port?
- Do you think legal regulations could better be improved beyond the present level in regulating waste management at the port? If yes, how?
- How can discharge of waste into the port be it accidentally or secretly be further managed in view of the present legal regulation?
- Please could you give me your view of how waste can be adequately managed at the port vis-à-vis the legal regulations?
- What is your view about port state control in stemming the tide of influx of waste at the port?
- Would you recommend judicial prosecution of waste offender?
- Do you any remember any case of successful prosecution of waste offender in your country?

Interview question 4: How can waste at the port be improved and effectively managed for sustainable national development?

- How can waste generated via shipping activities at the port be improved?
- Can waste at the port be totally eradicated and effectively managed?
- How can the improvement be sustained?
- How can waste at the port be enhanced for sustainable national development and economic growth?

Interviewee 1
Southampton Port on Waste Management Strategy
Interview Response from Port Waste Management Staff (UK)

Introduction: My name is Oluwatosin, but for the purpose of this interview, you can call me Tosin.

Question: Who are you and what does your department do?

Answer: Am Mr John and am representing the management of the Southampton port. As you can notice, the port is very busy time and you came at a time when we need more hands-on deck. So, the time initially allocated would be reduced by some minutes.

Questions: Please what can you say about the port waste management in general?

Answer: Port waste and its impact at the Southampton port has greatly been reduced and more handled professionally. Now we have three companies managing waste at the port, while the port only serves as link between the ship owners and the companies for coherent arrangement for quick waste delivery.

Question: So, what has been the impacts of waste so far at the port, if there are any though?

Answer: In all sincerity waste has been reduced to the barest minimum at the port, and as such impact of unmanaged waste cannot be felt or seems to be obvious.

Question: How familiar are you with the legal framework on port waste management and what is your view about these existing legal regulations?

Answer: The port has great awareness toward its responsibility as far as legal regulations on waste is concern at the port. In fact, the regulations formed the bedrock of the port waste management. There is plethora of such regulations, from international conventions to regional legal directive and of course UK national law.

Question: That answer you gave on regional legal framework will propelled me to ask you this question Sir, what will now happen to the regional legal framework in the event of Brexit?

Answer: is very simple, the legal framework or whatever is call would be incorporated into our national law and becomes binding.

Question: Do you think the laws are too cumbersome to address port waste or do you think the legal regulations have brought much desire change that you seem to have anticipated no need to change the laws?

Answer: The laws is ok, not cumbersome as you said and of course it has brought tremendous improvement towards port waste management. The truth is that law is law everyone must respect it and must be implemented to the end.

Question: How do you think the legal regulations on port waste management could better be improved to enhance waste management at the port and have you had any

conflict with legal regulations in the implementation process with the national or regional laws?

Answer: I think this could be done via general and periodic review of the regulations in line with recent changes and technology involved and there had not being any reported cases of conflict of the law with regards to implementation.

Question: What is the mode of implementation of the legal regulations at the port, and are there penalties put in place to for inappropriate waste management by the ship-owners?

Answer: The mode of implementation of the regulations have already been set out in clear terms in the legal instrument, but if there is any internal policy by the port authority to ensure port waste free must be in agreement with the law. The penalties set by the law seems enough though to deter waste offender, so the port authority does not need additional enforcement mechanism but to work with the one already provided by the law.

Question: finally, please what is your view about waste management and disposal of ship-generated waste at the port?

Answer: Thanks, Tosin, I think generally management of port waste at the port has been handled professionally, and the moment the port has incorporated same in its agenda for next 10 years or so on proper waste implementation. The legal regulations are very effective to control waste generation at the port.

Researcher: Many thanks for your time sir, and hope if any further clarification on any of the points you raised I will let you know please.

Respondent: please do, and I will be glad to help you in this research to ensure you come out with recommendations that could help to improve port waste management.

Interviewee 2

Interview Response from Port Ship Owners (UK)

Introduction: My name is Oluwatosin, but for the purpose of this interview, you can call me Tosin.

Question: Please can you say something or tell me about yourself?

Answer: My name is James and I worked with ship owners' agency responsible for waste collection at the Southampton port.

Question: How do you think, in your assessment the laws and regulations have been fared in reducing waste at the port?

Answer: Generally, the legal regulations have set out the need for provision for facilities adequate to cater for any category of waste generated from the port. I think the port has been proactive to render good services to some of us the ship owners that we often use the facilities in line with legal regulations.

Question: What are the strategies designed by the port with a view to eradicate waste within the port and how effective is the strategies or is the strategies producing results?

Answer: I think as one of those who uses the port waste facilities often, I would say easy access to such facilities by the ship for waste delivery is second to none, and the strategy has been working so far so well. It has saved time normally spend at other port and give quick waste delivery with the brief time at the port.

Question: How can discharge of waste into the port be it accidentally or secretly be further managed in view of the present legal regulation?

Answer: I think the problems lies with the ship owners, because of the port seems to have provided adequate facilities to handle all manner of waste from ship. Nevertheless, the Maritime Coastguard Agency (MCA) needs to check ship to ensure waste delivery. Also, waste delivery signs should be more obvious for easy locations.

Question: Would you recommend judicial prosecution of waste offender?

Answer: Yes, and that is the only way apart from normal compensation and administrative liability that would be imposed by the port authority.

Researcher: Many thanks for your time, I hope if I need further question, I will be obliged?

Respondent: The pleasure is mine. All the best with your research.

Interviewee 3

Interview Response from the Licensed Waste Collector Agents (UK)

Introduction: My name is Oluwatosin, but for the purpose of this interview, you can call me Tosin.

Question: Please can you tell me about yourself and which organisation you are representing?

Answer: I represent the licensed waste collector agents within the Southampton port.

Question: How do you think, in your assessment the laws and regulations have been fared in reducing waste at the port?

Answer: The legal regulations have been very effective, and implementation has helped to reduce waste at the port. The laws have created more awareness and of course there is need to continue to create more awareness among the port waste reception facilities users.

Question: What are the challenges that you are faced with while dealing with waste at the port?

Answer: I will not call it challenge though, but just what I think should be trim down for waste at the port to be properly enhanced, like mode of contact between the port officials and the ship owners contacting licensed waste collector agency could be cumbersome. The steps need to be trimmed down to accommodate quick waste delivery.

Question: How do you think the legal regulations on port waste management could better be improved to enhance waste management at the port?

Answer: I think proper harmonisation of the legal regulations on port waste management cannot be over- emphasised. The various legal instruments have to for proper understanding and easy access by the port users. This will create an avenue to ensure adequate knowledge on how to manage waste at the port.

Question: Do you think the legal regulations have brought much desire change that you seem to have anticipated?

Answer: Yes, it has helped to reduced port waste drastically and hopefully the port authority and other stakeholder within the industry could endeavor to form what we can refer to as one-stop-shop for quick and easy access of waste delivery.

Question: How do you think the legal regulations on port waste management could better improve in enhancing waste management at the port?

Answers: Beyond the present level of effectiveness of the legal instruments, I think there should more opportunity for adequate surveillance within the port which can be more accommodated within the port. Similarly, terminal operators should also cooperate for quick evacuation with the license waste collector agency, by doing this the legal regulations would be more effective beyond the present level.

Question: At what stage do you get licensed waste collectors agents involved in the process of waste evacuation at the port?

Answer: The system here at the Southampton port is such that waste is collected from the terminal via machine provided by the operators and subsequently evacuated by the agents from the terminal point.

Question: Please could you give me your view of how waste can be adequately managed at the port vis-à-vis the legal regulations?

Answer: I think waste fees should be harmonized to accommodate various interest group in waste delivery for effective waste management. There seems to be different waste landing fees in other port in the UK and EU, hence this might encourage waste dropping sometimes.

Question: What is your view about port state control in stemming the tide of influx of waste at the port?

Answer: I think it is the responsibility of port state under the various Memorandums of Understanding like Paris MoU Tokyo MoU and Abuja MoU for West African countries to ensure compliance with the law and bring it force. I think it will be a nice effort to established port waste regulatory monitoring theme to ensure proper compliance within the port on waste management.

Question: Do you think ships could be monitored at the port to avoid waste dumping?

Answers: Yes, via established port policy and adequate surveillance system. This will go a long way at exposing waste offenders and keep the port clean.

Questions: Have there been any side effect of unmanaged wastes to the socio-economic development of the ports and its environs, and what are the challenges that you faced with while dealing with waste at the port?

Answer: At the Southampton port, the impact of port waste is not obvious. This is due to robust policy established between the port authority and licensed waste collector agents to ensure quick waste collection and clean environment. The only challenge would be means of communication when ships want to discharge waste. I think this could be abridged, to avoid unnecessary delay to waste disposal at the port.

Question: Can port completely get rid of unmanaged port waste?

Answer: Yes, if the law is adequately implemented and religiously followed, the I see no reason why waste cannot be completely reduced at the port.

Researcher: Many thanks for your time.

Respondent: The pleasure is mine, and good luck with your research.

Interviewee 4

Apapa Port Managers (NPA) Nigeria

Introduction: My name is Oluwatosin, but for the purpose of this interview, you can call me Tosin.

Question: Please can you introduce yourself and the organisation you are representing in this interview?

Answer: My name is Matthew and am representing the management of the Nigerian Port Authority as far as this interview session is concern.

Question: How familiar are you with the legal framework on port waste management and what is your view about the existing legal regulations of port waste management?

Answer: Well, by virtue of my position within NPA I think am most familiar with some of the regulations. My view about the regulations is that it has helped to improve and reposition waste management at the port. The regulations cover the international legal framework, regional and national regulation, all the regulations are very important to the administration of port waste management.

Question: Can you tell me some of the legal framework you are referring to here, and the very important one that is guiding your responsibility at the port and do you think the law is too old or cumbersome to address port waste?

Answer: We do have principal legislation like MARPOL that regulates waste management within the port, and other international conventions including the regional regulation such Abuja MoU plus the Nigeria law regulating waste at the port. Some of these laws are in public glance, I do not think I need to lecture you on that as researcher though, as to where to find the laws. The laws are not cumbersome, and they are not too old, but I think there is need for periodic review to tailor it with reality within the African settings.

Question: Do you think the legal regulations have brought much desire change that you seem to have anticipated, and how do you think the legal regulations on port waste management could better improve in different ways to enhance waste management at the port?

Answer: I think the answer to that question might be subjective, in the sense that and to be honest with you, some of this law has brought necessary changes to port

waste management, but the port authority still has work to do, particularly to further enhance the workability and implementation of the law. However, there is no guarantee of their use for environmental purposes.

Question: As a follow up to your response on the workability and implementation of the law, please could you tell me how this could further help to reduce waste at the port?

Answer: I think the laws need to first be domesticated through the act of parliament, and this could take years in Nigeria due to slow pace of law making. What we have done as port is to incorporate the principle of the international conventions that Nigeria is signatory into the port policy with a view to give efficacy to the international regulations. And by doing this, waste offender could be brought to justice within the parameter of the legal regulations via port policy. I think the waste management plan can be effective if it promotes the use of methods for economic regulation of activities in to reduce the amount of waste on the port.

Question: Who is responsible for waste evacuation within the port and how is it done in line with the port policy on waste management?

Answer: I think the port authority only set out policy in agreement with existing laws on port waste management, however there is a company called African Circle Limited that has gone into Public Private Partnership (PPP) for waste evacuation. In fact, this company is responsible for the management of port waste within West African countries.

Question: Do you think this PPP arrangement has able to help reduce waste at the port in view of the requirement of the existing legal regulations?

Answer: Yes, I think it has helped to reduce waste at the port, but if the international law is fully at work, maybe it will be much better. However, at the moment I can say reduction of waste at the port maybe at the best, but more improvement can still be seen.

Question: What other thing do you think you can tell us about Apapa port waste management that we give further insight into how waste management can be improved within legal regulations?

Answer: Apart from the response given already, I think the port has developed some steps at making sure waste disposal is given adequate attention and quick delivery in line with what is practicable in other developed country. Some of the steps include to note the types of waste to be delivered, quantity of waste, etc.

Researcher: Thanks for your time sir. Hope to contact you further if I needed clarification on this matter?

Answer: You are welcome any time and I wish all the best with your research.

Interviewee 5

Nigerian Maritime Administration and Safety Agency (NIMASA) Nigeria

Introduction: My name is Oluwatosin, but for the purpose of this interview, you can call me Tosin.

Question: Please can you tell me about yourself and what Nigerian Maritime Administration and Safety Agency does (NIMASA)?

Answer: I represent NIMASA and I think you can find most of what we stand for on our website page. In summary we regulate the port administration via national law. We are government agency responsible for the day to day administration of the port.

Question: Please can you tell me some of the national laws you trying to talk about?

Answer: Some of the laws are Nigerian Maritime Administration and Safety Agency Act 2007, Merchant Shipping Act 2007 and Coastal and Inland Shipping (Cabotage) Act 2003. And they regulate port waste generally.

Question: How do you think, in your assessment the laws and regulations have been fared in reducing waste at the port?

Answer: The law has been very helpful at making sure that port waste is properly managed. The adequate implementation of the laws has helped to reduce waste at the port. The laws captured the need of the port as far as waste is concerned.

Question: What are the strategies designed by your port with a view to eradicate within the port and how effective is the strategies or is the strategies producing results?

Answer: At the moment, the strategies is to sort out port waste with a private company for adequate handling that is devoid of normal government bottleneck which to some extent has eliminate corruption and infused accountability into the system. I think, if all parties come together (policy, society, ecosystem) the management of waste will be more effective. In addition, it should be considered that population growth is on the rise and more people the management of waste becomes much more difficult.

Question: How can discharge of waste into the port be it accidentally or secretly be further managed in view of the present legal regulation?

Answer: Maintain higher standard of adequate surveillance and monitoring within and around the port, particularly during ship berth would be the means to ensure waste does not flow into port water.

Question: Would you recommend judicial prosecution of waste offender and do you have any case of successful prosecution of waste offender in your country?

Answer: Of course, I will recommend such as port state part of our responsibility is to ensure port is free of waste and anyone cut or liable would be prosecuted. At the moment there is no such case, but that does not mean people are in compliance with the law, but we need to increase our surveillance to ensure the law can bite?

Researcher: Thanks for your time sir, and I hope if there is need to call again for further clarification, I be granted opportunity to see you?

Answer: Of course, I will be readily available to help in any capacity.

Interviewee 6

Nigerian Shippers Council (NSC) Nigeria

Introduction: My name is Oluwatosin, but for the purpose of this interview, you can call me Tosin.

Good afternoon Mr. William, the last time I was here we had a brief chat for 5 minutes on the subject matter of my research topic, hence, today I want to raise some questions in view of last chat.

Question: I know you are representing the above organisation, but please can you tell your view about waste management at the port vis-à-vis the legal regulations?

Answer: The legal regulations are well structured to meet the need the port users as far as waste management is concern, and waste management policy of the port is ok, but just need more changes to meet the quality expected from the ships owners.

Question: How do you think the legal regulations on port waste management could better improve in enhancing waste management at the port?

Answer: Yes, it can be improved, the laws regulating waste at the Apapa port are alive and dynamic, but I think most of these laws should have been more concise and gathered into a single document for effective implementation. The enforcement of environment laws in Nigeria has been problematic, and it has met with limited success due to this.

Question: How effective is the strategies or is the strategies producing results and how would you assess the response of port management and government policy towards waste management at the Apapa port?

Answer: The authorities need to work on calculation and justification of the need for long-term development of foster care weapons the only strategy seems known to me is by given the waste management to a company and sets up agency to oversee the performances of waste management at the port. And I think it has helped the port to manage waste effectively.

Question: How can discharge of waste into the port be it accidentally or secretly be further managed in view of the present legal regulation?

Answer: The only way is to strengthen the monitoring team is to ensure proper surveillance and create an awareness on the danger of waste dropping from the ship operators. Awareness conference could be held periodically so that port stakeholders would be able to be familiarised themselves with need to stop dropping waste into the

maritime environment. And the proper implementation of the law should be matter of priority for the port authority.

Question: What are the other challenges of port waste at the Apapa port that you think can impeded your organisation from waste disposal?

Answer: I think is capacity building. What I mean by that is that waste management company needs to build structure that can withstand the level of waste generated within the port. The truth is that, over the years waste at the port has been label with inadequate waste management structural development. I think the company responsible for waste removal at the port, should endeavour to have enough structure to handle such from Apapa port in quick time to avoid delay often and presently experience by some of our members in disposing off their waste.

Question: Apart from setting up adequate facilities to receive waste at the port, what other challenges as far as the legal regulations are concern?

Answer: I think in fairness to the system, and apart from what I have said so far, the most striking issue rest on proper implementations of the laws and create an informed awareness among the port stakeholders on the to dispose waste in a more conventional way to avoid environmental hazard. Conventional ways will include; recycling of the waste, treatment of the waste, and other ways to treat waste coming from industry like port.

Question: How can you rate waste treatment and handling at the port?

Answer: The location of waste collection and accumulation sites, location of facilities for processing, utilisation and, neutralisation, disposal of waste, scheme of waste streams from sources of their formation to facilities used for processing, utilisation, neutralisation, disposal of waste. For the organisation am representing, our rate would be 60% either collection, treatment or other matter related to waste management at the port.

Researcher: Many thanks for creating time out of your busy schedule to honour the interview session.

Respondent: The pleasure is mine and I wish all the best in your research and study.

Interviewee 7

African Circle Pollution Management Limited (ACPML) Nigeria

Introduction: My name is Oluwatosin, but for the purpose of this interview, you can call me Tosin.

Question: Good afternoon, please can you introduce yourself and the organisation you are representing?

Answer: My name is Adeajayi and am representing African Circle Pollution Management Limited.

Question: What are the duty of your organisation within the port, and what is your assessment on port in waste management?

Answer: My organisation caters for waste at the Apapa port. We ensure that evacuation of waste within the port right from the ship calling at the port to the point of departure. And my assessment about waste at the port will be a work in progress.

Question: How familiar are you with the legal framework on port waste management?

Answer: Yes, we know the legal regulation, but we are only working with national laws not the international legal regulations.

Question: How do you think the legal regulations on port waste management could better improve in enhancing waste management at the port?

Answer: By adequately implementing the law, to ensure there is no lapses at the implementation.

Question: Are there penalties put in place for inappropriate waste management by the ship-owners?

Answer: Not really save the one stipulated under the law, and a private company our duty is to take and ensure clean port free of waste not to prosecute or implement the law. I think that is being done by the port authority, but sometimes we allow under the port policy to report any cases of inappropriate waste dumping at the port by the ship operators.

Question: What is your view about port state control in stemming the tide of influx of waste at the port?

Answer: To reduce the impact of inadequate waste management, the operational management of the NPA has to collaborate with relevant agencies for adequate port

waste delivery to the company. The system of communications needs to be strengthening to ensure quick response to waste delivery from ship at the port terminals.

Question: At the moment do you think your company has enough resources to handle waste generated at the port including ship-generated waste in line with provisions of the law?

Answer: I think the ACPM has developed the capacity to ensure port waste is adequately handled by providing a quick response to waste evacuation at the port. Given this, the capacity of the company has further been enhanced through the introduction of additional technical staff to handle equipment for more productive and efficient management of waste at the port.

Question: What are the challenges that you faced with while dealing with waste at the port?

Answer: The major challenge has to do with port congestion and it often difficult to find our way to collect waste from the ship at the port if the port is congested due to shipping activities at the port. Also, awareness must be created among ship owners against the backdrop of waste dumping into port waterways and, by extension, the port.

Question: What other steps you think can help to enhance effective waste delivery?

Answer: To put an end to the threat of waste, there should need for periodic re-assessment of the system of waste management at the port. Although various options are opened like incineration, gasification and composting. which are available as a solution for waste management, it does seem that these options also add to the complexity of the situation in determining the best alternatives and decisions to take in tackling port waste.

Researcher: Many thanks for your time sir.

Answer: Thanks, and I wish all the best in your PhD research.

Interviewee 8

Nigeria's National Inland Waterways Agency (NNIWA) Nigeria

Introduction: My name is Oluwatosin, but for the purpose of this interview, you can call me Tosin.

Question: Please can you tell me which agency are you representing and your role within the agency?

Answer: Am representing Nigeria's National Inland Waterways Agency and am a public relation officer.

Question: Can you tell me some of the activities of your agency in relation to waste management along the Nigeria water ways?

Answer: Basically, our agency responsibility as far as waste along the Nigeria water concern, is to serve as watch dog within the Nigeria maritime industry at ensuring save water ways.

Question: Do you have laws regulating your activities in this area you seem to cover?

Answer: Yes, we work with existing legal regulations on port waste management, which am sure that you are familiar with, and we try to implement it along with our primary duty.

Question: Please can you give example of some the duties you often undertake at safeguarding the water ways?

Answer: Some of the responsibility include but not limited to following, navigational dredging and dredged material disposal, construction of new piers and wharves, construction of new terminals with extensive backup facilities for container storage, widening and deepening of navigational channels in the port, construction of new ship locks, and implementation of oil spill response capabilities etc.

Question: It seems you have a lot to cover, but how do you get found to ensure smooth operation of your activities with this area?

Answer: Where are government agency under the ministry of transport, hence get allocation via the ministry annual budget presented to the National Assembly every year to cover and implement our duty on the Nigeria water ways and to ensure waste free from channels. The carrying out of environmental surveys to justify the setting of discounts from environmental charges (tariffs) is necessary. It will also help in the investigation of cases of refusals to perform services for the removal of ship's waste. The implementation of the goals and objectives of the plan is achieved on the basis

of interaction with the public authorities and control in the field of security environment, economic relations and tariff policy, entities of port activity.

Respondent: Please I have to go now, am having meeting and that is all that can give on this topic. I wish you all the best in your research.

Researcher: Thanks for your time sir. Bye.

Interviewee 9

Nigerian Waste Management Authority (NWMA) Nigeria

Introduction: My name is Oluwatosin, but for the purpose of this interview, you can call me Tosin.

Question: Please can tell me which organisation you are representing and your name for proper identification?

Answer: My name is John and am representing Nigeria Waste Management Authority.

Question: How familiar are you with the legal framework on port waste management and what is general assessment on the existing legal regulations of port waste management?

Answer: The organization is well aware of the legal framework and its importance in carrying out our duty as far as waste management is concern.

Question: Do you think the legal regulations have brought much desire change that you seem to have anticipated?

Answer: The law has brought tremendous changes to how waste is managed within and around the port. For instance, according to our records, Apapa port waste generation is on the increase at an estimated rate of about 0.5 - 0.7% per annum, and this appears correspond to the rate at which the port's activities are growing. Therefore, as an organization empowered by law to regulate and monitor waste within the Lagos State and by extension Apapa port and its surroundings we have an obligation to protect the people living around port from effect of waste generation from the port.

Question: Going by your submission, I think your organization seems to have similar role with some other sister government agency saddled with same responsibility, therefore how do you manage conflict of interest?

Answer: I quite agree with you on that, but our organization is working directly with the State Government and we are protecting the interest of people of Lagos living around the Apapa port from impact of unregulated or unmanaged waste. So, we often ensure right thing is done at the port with regards to waste management to avoid negative effect on our people.

Question: So, what you are saying now is that there no conflict of interest or clash of duty with other sister agency?

Answer: Well there could be clash of duty, but no conflict of interest, because our interest is to eliminate impact of waste that might flow from the port water which can affect people of Lagos State. Basically, our interest should be doing the right thing to avoid consequence of waste from the port to the people living around the port.

Question: I know my time is up, but please can you tell me going by your experience and observation of the legal regulations, if waste free environment is possible at the port?

Answer: I think my response would be yes in view of the existing legal regulations available in Nigeria. However, Apapa Port ambitions for waste management are achievable with appropriate, well-targeted and unified policy mechanisms that will be driven by strong political focus, business initiatives and technological innovative. Upright and plane partnership among government and private sector at the port is necessary to ensure that the restructuring programme of the government brings a sustainable change to the port. That said, government agency entrusted with the responsibility to ensure adequate port waste management must do so within the purview of the enabling laws available in the country.

Researcher: Many thanks for your time John, and I do appreciate your contributions to this research.

Answer: Thanks for chosen as one of your targeted participants in your research, and I wish you all the best Tosin. I like what you are doing keep it up.

Interviewee 10

Maritime Workers Union of Nigeria (MWUN) Nigeria

Introduction: My name is Oluwatosin, but for the purpose of this interview, you can call me Tosin.

Question: Many thanks for your time and I will try to go straight to the points, but before I start, please can you tell me your name and the organisation you are representing?

Answer: My name is Marry and am representing Maritime Workers Union of Nigeria.

Question: What is your assessment of the port on waste management, and how familiar are you with the legal framework on port waste management?

Answer: Generally, management of waste at the port is ok, but still need some effort to be put in place though. The legal regulations are working and to my best of knowledge the implementation is quite good because is producing result. Based on what is on ground at the moment, I could say the legal regulations are producing results from what it is used to be, when there is no proper monitoring capacity, having said that there is still room for improvement as well.

Question: As a follow up to your last statement, please what are the improvement you want to see as far as waste management is concern at the port?

Answer: I will summarise my thought like this, I want to see a very proactive waste management theme, I want to see waste offender arrested and prosecuted, the law must be active, I want to see proper surveillance on our water ways to checkmate waste dropping by ships and other offences, I want to see cooperation among government agencies and parastatal to be able to implement waste management policy of the port authority and government and finally I want to see harmonisation of the various legal regulation in a single document and presented in a language devoid of legal jargons so that ordinary man could understand what is written in the law. I think it will helpful to understand what to do and not to go against the law.

Question: You have raised so many issues, but because of our time, I would like to take you up on the last point you raised. Are you saying the legal regulations are too many and should be compressed to a single document written in clear language?

Answer: What am saying is that the language of the legal regulations should not be too legalistic in language setting, because most people would not understand it, and it will often allow setback for waste management at the port.

Question: do you think the port has robust waste policy and what is your view about waste evacuation at the port?

Answer: My response to that would be yes, the port has good policy, but corruption among those that are meant to implement should be address. At the moment we have a private company responsible for the collection of the waste in West African countries. The company call African Circle, the company is doing well, but I think like most developed countries there should be more than one company handling waste at the port for clear and effective waste evacuation. This will also create room for competition and efficiency among the company. This because if one is not doing well, and any ship that want to dispose waste of could go to other who is doing well but is this present circumstance now we only have one company who is doing everything.

Researcher: Many thanks for your time Mrs. Marry Alale, please enjoy the rest of the day.

Answer: Thanks, and good luck in your PhD my brother.

