

**CHALLENGES FACING IMPLEMENTATION OF THE PRECAUTIONARY PRINCIPLE IN NAMIBIAN  
MARINE PHOSPHATE MINING REGULATION**

by

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To be submitted in partial fulfillment of the requirements for the degree

**MAGISTER LEGUM (LLM) IN EXTRACTIVE INDUSTRY LAW IN AFRICA**

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October 2018

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## CERTIFICATION OF AUTHENTICITY

I, Kennedy Haraseb, declare that this dissertation is my original work and other works cited or used are clearly acknowledged. This work has not been submitted to any University, College or other institution of learning for any academic award.

Signed at Pretoria on this the 31<sup>ST</sup> day of October 2018.

\_\_\_\_\_ (signature on copy of final document)

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## SUPERVISOR'S CERTIFICATE

I, Leonardus J. Gerber, hereby certify that the writing of this dissertation was conducted under my supervision.

Signature: \_\_\_\_\_ (signature on copy of final document)

Date: \_\_\_\_\_

## PREFACE

If it takes a village to raise a child, then surely it takes the world to raise a dissertation. In examining a topic that is fascinating, painful and rewarding, I have been buoyed by a global-spanning community of old friends and new friends who have given generously of themselves so that this dissertation could happen.

My interest in seabed mineral mining dates back to July 2011 when Namibia was the first country in the world to award a licence for marine phosphate mining on the continental shelf. This dissertation is a consequence of a process of thinking by the writer, which occurred after the Rio Declaration launched the precautionary principle into global consciousness. While debates continued to simmer on defining the principle, I turned my attention to what the Secretariat within the Benguela Commission was doing in response to the legal obligation to implement the principle. Namibia Chamber of Mines has inspired this dissertation and encouraged me in my ambitious research.

Profound appreciation goes to the course coordinator and dissertation supervisor - Adv. Gerber - for his advice, guidance and direction which has allowed me to research an emerging field in the Extractive Industry. Colleagues at the OR Tambo Law Library have been supportive at all times throughout the writing process, and The Revd Swanepoel has done invaluable editorial work. Anonymous external reviewers contributed to the sharpening of the chapters.

The degree in Extractive Industry Law in Africa could not have been possible without the sustained support of my parents - Festus Haraseb and Ferdrika Harases. Their unfailing belief in me and the countless sacrifices they had to make to afford me the opportunity to complete my studies at the University of Pretoria has humbled me. They gave me the opportunity to read, think, write and edit. I know they will be proud of the final product. I wish to show special appreciation to the Lord who provides me with strength and wisdom beyond my natural ability.

## DEDICATION

This is dedicated to everyone devoted to a Namibia where justice, sustainability and well-being thrive.

## ABSTRACT

With the endorsement of the world's first Marine Phosphate Mining (MPM) licence by the Ministry of Mines and Energy in July 2011, The Benguela Commission's (Commission) mandate to protect and sustain the marine ecosystem is being tested.<sup>1</sup> The interest shown by prospectors of Namibia's continental shelf is confirmation of its potential mineral reserves. In this regard, advances in technology are transforming the way phosphoric sediments are explored and extracted. The advances in MPM are not without consequences. Surbun argues that there is tentative evidence that the use of specialist vessels affects the marine ecosystem. Their use has an impact on the breeding, communication and migration patterns of sea creatures.<sup>2</sup> In *'Challenges facing implementation of the Precautionary Principle in Namibian marine phosphate mining regulation'*, a study is conducted relating to the regulation, management and sustainability of the marine ecosystem.

In addition to the above, this dissertation will assess the implementation of the Benguela Current Convention (Benguela Convention) in practice with regard to the Atlantic Large Marine Ecosystem (ALME).<sup>3</sup> Included in the study will be an assessment of environmental protection standards, procedural safeguards and decision-making processes by the Secretariat of the Commission, with reference to the Marine Spatial Planning Initiative (MSPI) paper and the Strategic Environmental Assessment (SEA) report. This study is offered as an objective survey of some of the benefits that man can enjoy and some of the hazards that he must face in a responsible approach to the protection of the marine environment.

Keywords: marine phosphate mining, precautionary principle, law and policy, sustainable development, risk assessment, risk management, best environmental practices.

Discipline: Law

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<sup>1</sup> African News Agency 'Namibia approves world's first marine phosphate mining project' 19 October 2016 <http://www.miningweekly.com> (accessed 16 July 2018).

<sup>2</sup> V Surbun 'The regulation of offshore seismic surveys for petroleum resources in South Africa's maritime realm' (2014) 22 *South African Journal of Environmental Law and Policy* 129 – 157.

<sup>3</sup> Benguela Current Convention 2013, article 4(1)(c).

## LIST OF CITATIONS, ABBREVIATIONS AND ACRONYMS

ACOPS – Advisory Committee on Protection of the Sea

ALME – Atlantic Large Marine Ecosystem

Benguela Commission - Commission

Benguela Convention – Benguela Current Convention

Brutland Commission – The World Commission on Environment and Development, 1987, under the chair of Gro Harlem Brundtland

Brundtland Report – United Nations Report of the World Commission on Environment and Development: Our Common Future (1987)

CBD – Convention on Biological Diversity

CEM – Centre for Environmental Management

CMN – Chamber of Mines Namibia

CNFA – Confederation of Namibian Fishing Associations

Constitution – Constitution of the Republic of Namibia, 1990

CSP – Corporate Social Responsibility

DAP – Direct Application Fertiliser

DMC – Decision Making Committee

EA – Environmental Assessment

EC – Environmental Commissioner

ECC – Environmental Clearance Certificate

EEZ – Exclusive Economic Zone

EIA – Environmental Impact Assessment

EMP – Environmental Management Plan

EMA – Environmental Management Assessment

EMS – Environmental Management System

EMA – Environmental Management Act

ES – Environmental Statement

EU – European Union

GDP – Gross Domestic Product

ICJ – International Court of Justice

ICBD – International Convention on Biological Diversity

IFDC – International Fertiliser Development Corporation  
ITLOS – International Tribunal for the Law of the Sea  
ISA – International Seabed Authority  
LLNP – LL Namibia Phosphates  
LME – Large Marine Ecosystem  
MET – Ministry of Environment and Tourism  
MME – Ministry of Mines and Energy  
MSPI – Marine Spatial Planning Initiative  
MPM – Marine Phosphate Mining  
MPMA – Minerals Prospecting and Mining Act  
NMP – Namibia Marine Phosphate  
PP – Precautionary Principle  
Rio Conference – The United Nations Conference on the Environment and Development (also known as the Earth Summit) held in Rio de Janeiro in 1992  
Rio Declaration – The United Nations Rio Declaration on Environment and Development (1992)  
SADC – Southern African Development Community  
SDF – Spatial Development Framework  
SD – Sustainable Development  
SEA – Strategic Environmental Assessment  
TTR – Trans Tasmin Resources  
UN – United Nations  
UNCED – United Nations Conference on the Environment and Development  
UNCLOS – United Nations Convention on the Law of the Seas  
UNISDR – United Nations International Strategy for Disaster Reduction  
WCED – World Commission on Environment and Development  
WSSD – World Summit on Sustainable Development, Johannesburg, 2002



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# 1 INTRODUCTION

## 1.1 BACKGROUND TO THE STUDY

The sea is a vast environmental laboratory from which we have much to learn.<sup>4</sup> It is an immense, remote biome, providing important economic, environmental and social opportunities. For about a hundred years, science and industry have known of the existence of nodules carpeting the seabed floor in many parts of the world's oceans. They are found in a wide range of sizes and distributions, and their grade component varies. Although these nodules contain over twenty elements, the components of principal commercial interest today are nickel, copper, cobalt, manganese and phosphate.<sup>5</sup>

The phosphatic material on the Benguela shelf is considered to have been formed by the action of phosphate-rich ocean water circulating through pre-existing limestone and calcareous sediments. The nodules (a general term referring to fragments of lithified phosphate sediments) have been eroded from outcrops of phosphorite which had been exposed to weathering during periods of marine regression. The extent of the phosphate material distributed on the sea floor, therefore, generally reflects the extent of the original rock outcrops. On account of the high phosphorite content and the size of these mineral resources, they have generated great interest within the extractive industry as being a future source of raw material.<sup>6</sup>

Prospecting and mining activities have various impacts on the environment.<sup>7</sup> In addition to this, Benkenstein argues that as marine mining technology advances there is 'a renewed interest in the mineral wealth of the seabed'.<sup>8</sup> In particular, Kathryn states that MPM is an emerging extractive industry with national and international regulations currently being developed.<sup>9</sup>

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<sup>4</sup> AD McIntyre *et al* *Life in the World's Oceans: Diversity, Distribution and Abundance* (2010) 139-160.

<sup>5</sup> M Van Wyngaardt 'Proponents see glistening future in seabed mining, but environmentalist fret' 24 March 2017 <http://www.miningweekly.com> (accessed 14 March 2018).

<sup>6</sup> CP Summerhayes 'Distribution, origin and economic potential of phosphatic sediments from the Agulhas Bank, South Africa' (1973) 76 *Transactions of the Geological Society of South Africa* 271-278.

<sup>7</sup> A Paterson and LJ Kotze *Environmental Compliance and Enforcement in South Africa* (2009) 1-9.

<sup>8</sup> A Benkenstein 'Seabed Mining: Lessons from the Namibian Experience' (2014) 87 *Governance of Africa's Resource Programme* 1-4.

<sup>9</sup> J Kathryn *et al* 'A call for Deep Ocean Stewardship Science' (2014) 344 *Science* 696.

Given these latest developments, case studies in Namibia reflect a growing conflict between the fishing and extractive industry over the exploitation of Namibia's marine resources.<sup>10</sup> On this premise, the Minister of Fisheries and Marine Resources, Mr. Esau, on 17 September 2013, imposed an eighteen-month moratorium on all MPM activities which is to last until the MSPI paper and SEA report have been completed.<sup>11</sup> This decision, in the interim, has neutralised tension between the Confederation of Namibian Fishing and Environmentalists on the one hand, and the MPM industry on the other.<sup>12</sup>

*The Namib Times*, an English weekly, reported that Namibia has the third largest phosphoric sediment deposits in the world with a potential annual contribution of N\$ 728 million to the national fiscus.<sup>13</sup> Phosphate deposits on the Namibian seabed are targeted for use as commercial fertilizer.<sup>14</sup> These deposits, however, occur in waters that support productive coastal fisheries which are important to the national economy, fisheries stakeholders and an indigenous community.<sup>15</sup> In this context, MPM presents not only a potentially imminent environmental challenge but also a momentous opportunity for the extractive industry.<sup>16</sup>

In the light of the above, environmental protection will require the application of the precautionary principle (PP) in which conservation measures are implemented for MPM.<sup>17</sup> Effective implementation of the PP requires active reviews of EIAs and EMPs and the appointment of independent technical councils to develop national legislative frameworks for this emerging extractive industry.<sup>18</sup> The comprehensive reform of environmental governance is vital for Namibia's socio-economic growth and development, but steps taken so far are symbolic in character and are little influenced by the sustainability discourse.<sup>19</sup>

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<sup>10</sup> All Africa 'Four File Case Against Phosphate License' 2 November 2016 <http://www.allafrica.com> (accessed 14 March 2018).

<sup>11</sup> Namibia Superior Courts 'Namibia Marine Phosphate Mining Limited v Minister of Environment and Tourism' 11 May 2018 <http://www.ejustice.moj.na> (accessed 15 June 2018).

<sup>12</sup> C Kaira 'Phosphate Mining banned' 19 September 2013 <http://www.namibian.com.na> (accessed 14 March 2018).

<sup>13</sup> Namib Times 'Namibia Marine Phosphate comes out of its corner' 8 November 2016 <http://namibtimes.net> (accessed 14 March 2018).

<sup>14</sup> SWAPO Party 'Phosphate Mining – Key to Namibia's Industrialisation' 1 June 2013 [http://swapoparty.org/phosphate\\_mining.html.com](http://swapoparty.org/phosphate_mining.html.com) (accessed 15 June 2018).

<sup>15</sup> *Ibid.*

<sup>16</sup> Mail and Guardian 'French outfit hunts for oil, gas off KZN coast' 27 June 2012 <http://mg.co.za> (accessed 12 March 2018).

<sup>17</sup> W Gullet 'Environmental impact assessment and the precautionary principle: legislating caution in environmental protection' (1998) 5 *Australian Journal of Environmental Management* 146-158.

<sup>18</sup> Benkenstein (n 8 above) 1- 4.

<sup>19</sup> K Bosselmann 'The Principle of Sustainability: Transforming Law and Governance' (2010) 22 *Journal of Environmental Law* 509-511.

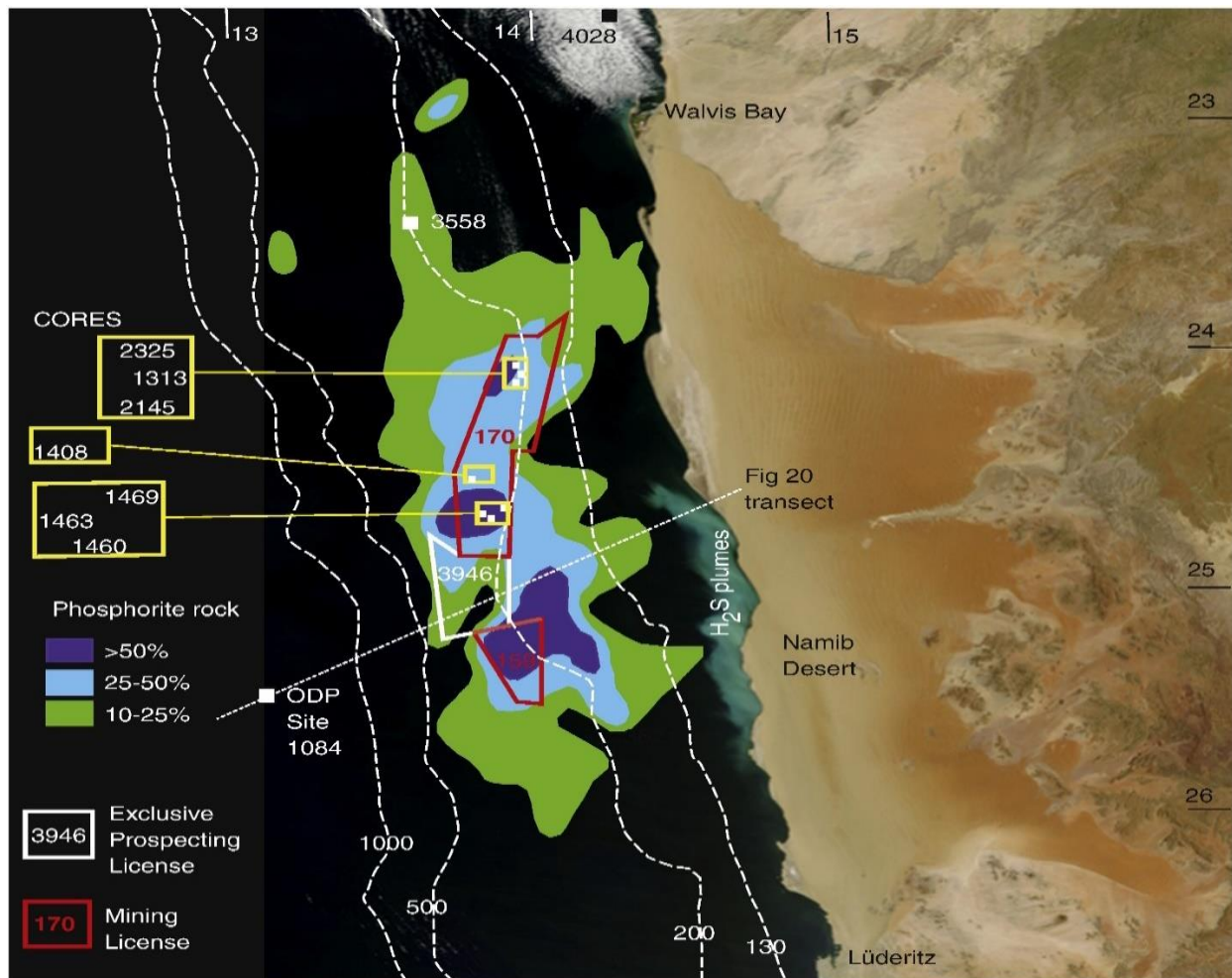


Figure 1: Phosphorite sediment on the Namibian continental shelf between Hottentots Bay and Walvisbay.<sup>20</sup>

## 1.2 RESEARCH QUESTIONS

### 1.2.1 Primary research question

Given the background of the dissertation, the primary research question that will be asked in the research study is:

To what extent, and in what manner, is the Benguela Commission implementing the Precautionary Principle in the Namibian MPM context?

<sup>20</sup> J Campton and E Bergh 'Phosphorite deposits on the Namibian shelf' (2016) 380 *Marine Geology* 290-314.

### **1.2.2 Secondary research questions**

In answering the primary research question, the following secondary research questions need to be answered:

Firstly, what is the statutory framework and political development for MPM in Namibia with reference to national, regional and international instruments?

The second question that needs to be answered is whether there is a need for a precautionary approach to MPM as set out in the Benguela Convention?

The third research question is twofold, and it is central to the primary research question. The first part of the question asks what the definition of precaution is, and the second part of the question asks how precaution can be translated into practice by regulatory and administrative bodies?

The fourth question encapsulates the primary research question and asks what protective measures and procedural and institutional frameworks can be adopted in law and policy to enhance the risk assessment and risk management of MPM in Namibia?

### **1.3 AIMS AND OBJECTIVES**

In answering the secondary questions posed by the research question the study will have to achieve the objectives described below.

The first objective of the study is to contextualise MPM and the role of precaution. The study will focus briefly on the economic benefit of the extractive industry as well as the environmental challenges it faces. The impact of the different extractive methods on the environment and the growing emphasis on SD will provide further clarity on the concept of MPM.

The second objective of the study will be to examine specific MPM legislation that focusses on the PP in the context of the national, regional and international literature.

The third objective of this study will be to analyse the core definition of precaution, its historical development and its interpretation by academic scholars.

The final objective of the study is to identify mechanisms through which the precautionary assessment of MPM can be implemented more effectively by law and policy for what ‘could ultimately be the largest scale human activity to impact the seabed directly’.<sup>21</sup>

#### 1.4 RESEARCH STATEMENT

Lupalezwi states that the extractive industry is beneficial to the economy and makes a significant contribution to the national fiscus.<sup>22</sup> As is very clear in environmental legislation, however, Namibia’s marine biodiversity is of importance and merits protection.<sup>23</sup> In order to protect the marine ecosystem effectively, sound environmental practices are required for the coexistence of both new and existing marine resource industries.

#### 1.5 RELEVANCE OF THE RESEARCH

The importance of this study lies not simply in its content, but also in its timing. For too long, the environmental impact uncertainties presented by MPM have impeded the development of the extractive industry. This study examines how the structuring of law, policy and finance for MPM can decrease environmental impact so that the prospects for the extractive industry may be enhanced. It is a study that improves the understanding of how a body of international law is incorporated, applied and interpreted within a domestic legal order. The findings of the study will, thus, support the Commission in adopting a proactive approach that addresses the conservation challenges faced by the marine ecosystem.

The present study, the first for Namibia on the mandate of the Commission, comprehensively reviews an important aspect of the principles of the mandate, namely its practical underpinnings. It thereby addresses the Commission’s experience of precaution in connection with its function which is how an

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<sup>21</sup> E Ramirez-Llodra *et al* *Man and the Last Great Wilderness: Human Impact on the Deep Sea* (2011) 6.

<sup>22</sup> Unpublished: S Lupalezwi ‘A Legal Overview of Namibia’s Mining Industry’ unpublished LLM thesis in International Trade and Investment Law, University of Pretoria, 2014 15-22.

<sup>23</sup> Constitution of the Republic of Namibia, 1990.



understanding of scientific uncertainty informs environmental decision-making. For this reason, the significance of the research remains.<sup>24</sup>

## 1.6 RESEARCH METHODOLOGY

The methodology employed in this dissertation is twofold. Firstly, desktop research is conducted in which the divergent views of different scholars on precaution are discussed while, secondly, the PP tests the risk assessment and risk management in the light of the Benguela Convention.

The primary sources utilized in the paper are The Benguela Convention, The Minerals (Prospecting and Mining Act) and the EMA.

The secondary sources consulted in the study include relevant books on the topic and journal articles, academic writings, newspaper articles, conference papers and case law.

In academic literature, the following terms are used, “precautionary policy,” “precautionary action,” “precautionary principle,” “precautionary measures” and “precaution”. Academics have argued that the different terms imply substantial differences in content. I suggest that this is not the case for the study in *casu*, unless stated otherwise.

## 1.7 RESEARCH PARAMETERS

The author recognizes the criticisms advanced against the law relating to precaution and the implementation thereof by the Commission to address MPM. This aspect is worth analysing in future research. This study is limited by its research questions. The lack of debate on this topic should, thus, not be interpreted by the reader as an intention by the author to diminish the value of precaution nor as skewing matters subjectively towards one side of the debate. Despite the plethora of publications on the PP, the need for clarification is great. I remain hopeful that the outcome of the study will produce some

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<sup>24</sup> KM Gjerde *et al* *Regulatory and Governance Gaps in the International Regime for the Conservation and Sustainable Use of Marine Biodiversity in Areas beyond National Jurisdiction* (2008) 1.

clarity and dispel some of the mist surrounding the issue.<sup>25</sup>

## 1.8 RESEARCH OVERVIEW

The study consists of five chapters and adopts the following structure.

### 1.8.1 Chapter One

This chapter introduces the study, outlines the background to the research, identifies the research problem, formulates the research questions, thesis statement, significance of the study, methodology, literature review and the limitation and outline of the study.

### 1.8.2 Chapter Two

This chapter examines the statutory framework and political development of MPM in Namibia with reference to national, regional and international instruments.

### 1.8.3 Chapter Three

This chapter outlines the PP by discussing its origin, meaning and historical development. The synthesis is based on academic literature and primary legal sources. Reference is made to the *Trans-Tasman Resources Marine Consent Decision* as a case study for assessing Precaution.

### 1.8.4 Chapter Four

Building on the frameworks outlined in the preceding chapters, the fourth chapter will then attempt to answer the primary research question. The chapter will discuss the three dimensions involved in implementation of precaution, namely the institutional, procedural and protective dimensions. The challenges in implementing the three identified dimensions are pointed out in the second part of the

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<sup>25</sup> M Ahteensuu 'Defending the Precautionary Principle against three criticisms' (2007) 4 *TRAMES* 366-381.

chapter.

### 1.8.5 Chapter Five

This chapter outlines the summary of the core findings drawn from the study, concluding remarks and recommendations. Recommendations are made regarding what could be done to manage the environmental impact of MPM more effectively. Conclusions are drawn that, in cases of scientific uncertainty, the PP is of relevance not only for management, but also for the assessment of risks.

The research was concluded on 31 October 2018 and therefore does not include references to or reflect on any developments that may occur after that date.

## 2 THE POLITICAL DEVELOPMENT AND STATUTORY FRAMEWORK FOR MARINE PHOSPHATE MINING IN NAMIBIA

### 2.1 INTRODUCTION

The first chapter introduced MPM as an industry that is characterised by potential environmental risks and scientific uncertainties. The chapter concluded that it is vital to breathe meaning into the concept of precaution by establishing policies and inter-departmental government structures. The purpose of this chapter is to provide a disciplined legal study relevant to the debate concerning MPM with reference to local, regional and international literature.

Great mineral wealth has been explored on the Namibian seabed.<sup>26</sup> Developing countries require large quantities for use both locally and across their borders. These countries are seeking to reduce their economic dependence on land-based mineral resources alone. On this premise, *The Economist* reported that all countries around the world will have to increase their production of food to intensive crop cultivation under irrigation in order to meet the increased global demand for nutrition.<sup>27</sup> For this there are two requirements, water and commercial fertiliser<sup>28</sup>

To this end, a number of countries are applying advanced technology, at considerable expense, to achieve the capability of exploiting seabed mineral resources. Given this premise, precautionary measures should be implemented by the Namibian government to ensure that it is well informed about the potential implications of MPM with regard to the environment and the economy.<sup>29</sup>

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<sup>26</sup> Benkenstein (n 8 above) 1 – 4.

<sup>27</sup> The Economist 'Phosphate is the commodity that will save the world' 23 August 2003 <http://www.economist.com.na> (accessed 10 April 2018).

<sup>28</sup> The Guardian 'The truth about the global demand for food' 2 August 2011 <http://www.theguardian.com> (accessed 2 May 2018).

<sup>29</sup> The Southern Times 'Present scientific evidence, NMP tells critics' 1 November 2016 <http://www.namphos.com> (accessed 30 April 2018).

## 2.2 OVERVIEW OF THE POLITICAL PARAMETER

### 2.2.1 The Mineral Resource at Stake: Phosphate and role of Phosphorus

According to Cho, phosphate is the eleventh most common element in earth, and it is essential to living organisms. Phosphate is important with regard to food production since it is one of the three nutrients (nitrogen, potassium and phosphorus) used in commercial fertiliser.<sup>30</sup> Phosphate cannot be manufactured, and no synthetic version is available. Modern agricultural production is, therefore, wholly dependent on mined rock phosphate to support crop yields.<sup>31</sup>

### 2.2.2 The Development of the Extractive Industry and its Mineral Resources: The Economic role-players

Namibian Marine Phosphate (NMP) and LL Namibia Phosphate (LLNP) were the first companies to explore the Atlantic seabed. The mining licence area explored was 2,233 km in extent, and it lies in water depths between 190 m and 345 m off the coast of Walvis Bay. The area contains an estimated 1.8 billion tonnes of phosphoric sand. Tests concluded by the international accredited agency, the International Fertiliser Development Corporation (IFDC), confirmed that the phosphate concentrate is suitable for use as Direct Application Fertiliser (DAP).<sup>32</sup> Industry statements have noted that the phosphate grade could almost equal the total of Namibia's land-based reserves of this natural resource. The proposition that nodules will play a growing role in satisfying the world phosphate demand in the face of declining grades of land-based ores seems indisputable, assuming that MPM is competitive in relation to presently mined land-based ores.<sup>33</sup> This then leads to the questions of what is at risk if or when commercial-scale MPM commences on the Namibian continental shelf.

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<sup>30</sup> R Cho 'Phosphorus: Essential to life – Are we Running Out' 1 April 2013 <http://www.blogs.ei.columbia.edu> (accessed 1 August 2018).

<sup>31</sup> *Ibid.*

<sup>32</sup> allAfrica 'Namibia: NMP Celebrates Namphos Trials' 7 June 2013 <http://www.allafrica.com> (accessed 16 June 2018).

<sup>33</sup> *Ibid.*

### 2.2.3 Marine Phosphate Mining and the Environment

A substantial amount of scientific research exists about seabed minerals. The biodiversity, habitats and ecosystems associated with these types of minerals are, however, less widely researched.<sup>34</sup> Just as with the land surface, the seabed is structurally complex owing to geological processes and structure-forming living things. The benthic ecosystems that people see most appear almost featureless because pounding waves prevent the persistence of most biogenic structures (e.g. sponges, corals, polychaete worm tunnels, sea cucumber faecal deposits). Yet, no less than is the case on land, seabed structures are crucial habitat features for most of the world's marine species. They provide a habitat for organisms that raise their feeding and respiratory structures above the slow-moving, often hypoxic, bottom boundary layer, and provide hiding places from predators. Coral reefs alone host a quarter of the world's marine fish species.<sup>35</sup>

Scientific studies illustrate the differences in environmental impact depending on the type of seabed mining, the grade and the technology processes. There is still much disagreement about which method does the least environmental damage; it probably depends on individual circumstances. Certain common effects of MPM may, however, be distinguished.

#### 2.2.3.1 The extraction methods:<sup>36</sup>

##### 2.2.3.1.1 Disaggregation:

Rotating discs are used to separate SMS deposits and crusts from other sea-bed material. This type of disc consists of a large, often very heavy, iron frame to which is attached a series of heavy chains. The rotating disc collects the polymetallic nodules.<sup>37</sup>

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<sup>34</sup> International Council for the Exploration of the Sea (ICES), Report of the ICES/NAFO Joint Working Group on Deep-Water Ecology, 16-20 February 2015, Portugal, ICES CM 2015/ACOM:27.

<sup>35</sup> G Kelleher 'The development and establishment of coral reef protected areas' (2000) 609 – 615 in Moosa *et al Proceedings of the Ninth International Coral Reef Symposium*, Bali, Indonesia, October 23-27, Ministry of Environment, the Indonesian Institute of Sciences (Indonesia).

<sup>36</sup> C Lee Van Dover 'Mining Seafloor Sulphides and Biodiversity: What is at risk?' (2010) 68 *ICES Journal of Marine Science* 341-348.

<sup>37</sup> *Ibid.*

### 2.2.3.1.2 Lifting:

On shores which are inaccessible to heavy mining plants, the continuous line bucket system is enclosed in a transportation vessel. Deployed from a raft under remote control, the nodules are pumped from the seabed to the surface by way of a vertical riser. The transportation vessel has to be stable but flexible for open-sea conditions. The vertical riser is deployed from the mining plant which, at the same time, inflates the water. When the nodules have been enclosed, it can be allowed to drift while the lift pump removes the seawater. The revolving discs of the vertical riser pick up phosphate nodules in preference to seawater. The return pipe returns the water.<sup>38</sup>

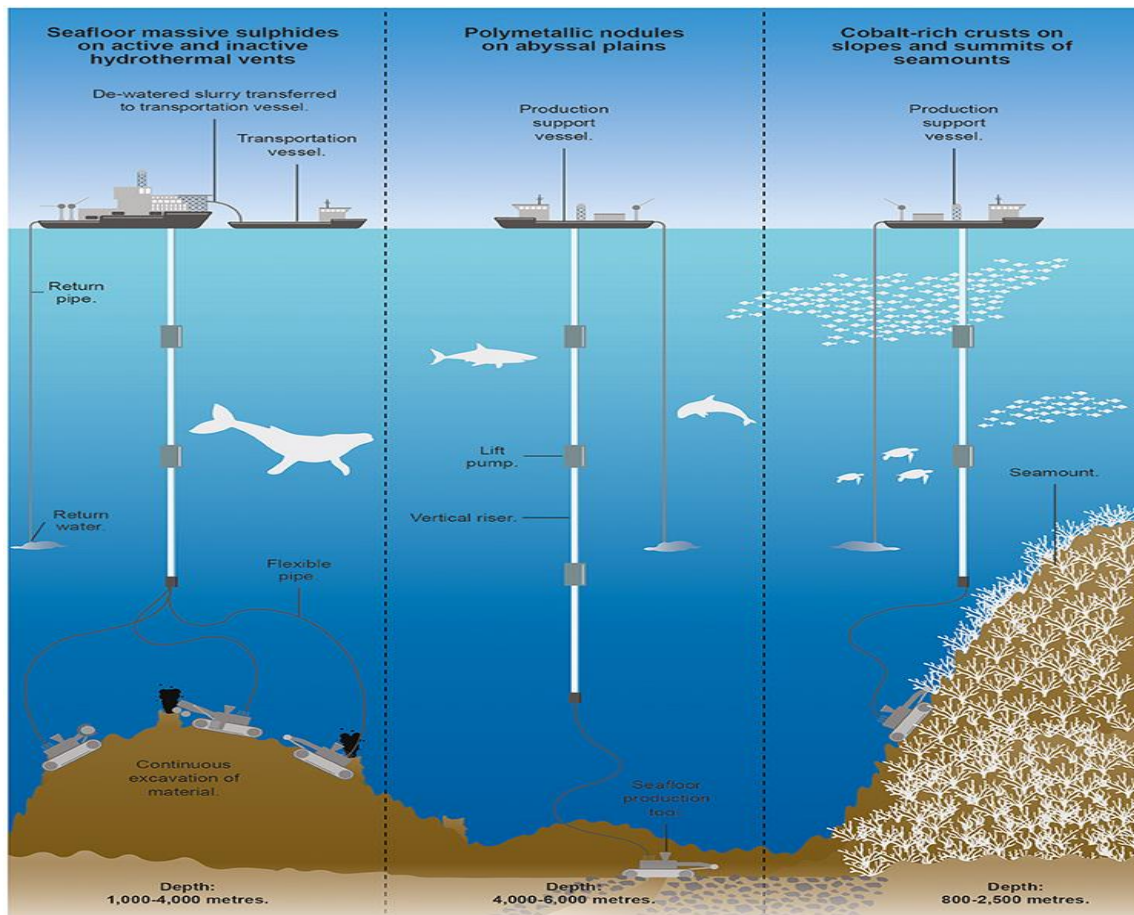


Figure 2: A diagram illustrating the process involved in seabed mining for seafloor massive sulphides, polymetallic nodules and cobalt-rich crusts.<sup>39</sup>

<sup>38</sup> *Ibid.*

<sup>39</sup> A Miller *et al* 'An Overview of Seabed Mining Including the Current State of Development, Environmental Impacts, and Knowledge Gaps' (2018) 4 *Frontiers in Marine Science* <https://www.frontiersin.org/article/10.3389/fmars.2017.00418> (accessed 21 July 2018).

### 2.2.3.2 *The following researched impacts are considered to be a potential challenge to the environment:*

#### 2.2.3.2.1 Impact on biodiversity

The substrate to which fauna are attached will be removed, overlying sediment will be cleared, and waste rock tailings dumped. Downslope and lateral operational plumes may be created, and there will be discharge plumes at mesopelagic depths. Seamounts have been impacted by bottom trawling. Recovery may take decades to centuries.<sup>40</sup>

#### 2.2.3.2.2 Impact on the Sea-Floor

Mining for ferromanganese nodules may potentially initiate changes in seawater quality through both the release of chemicals from the seabed and the processed minerals. Plumes may travel downslope or laterally and impact non-mined areas by smothering sessile organisms.<sup>41</sup>

#### 2.2.3.2.3 Impact on water column

The act of grinding sulphide deposits in the presence of toxic seawater will create toxic chemicals. While vent communities may be tolerant of some levels of toxicity, this will not be the case for organisms located away from the vent areas, and these are likely to be heavily impacted by the transfer of the toxins in plumes.<sup>42</sup>

The discharge from dewatering will contain sediment and may contain elevated levels of dissolved metals. Ingestion of contaminated water by organisms creates the potential for some bioaccumulation. Scientific studies by Boschen *et al* have concluded that the ecosystem will be disturbed at all levels, from the

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<sup>40</sup> E Baker and Y Beaudoin (eds) *Deep Sea Minerals: Manganese Nodules, a Physical, Bio-Logical, Environmental, and Technical Review* (2013) 27-42.

<sup>41</sup> H Thiel 'Evaluation of the Environmental Consequences of Polymetallic Nodule Mining Based on the Results of the TUSCH Research Association' (2001) 48 *Deep Sea Research Part II: Topical Studies in Oceanography* 3433-3452.

<sup>42</sup> F Althaus *et al* 'Impacts of bottom trawling on deep-coral ecosystems of seamounts are long-lasting' (2009) 397 *Marine Ecology Progress Series* 279-294.



plankton which includes the youngest stages of both plants and animals to the large fish which prey on shore animals when the tide is in.<sup>43</sup>

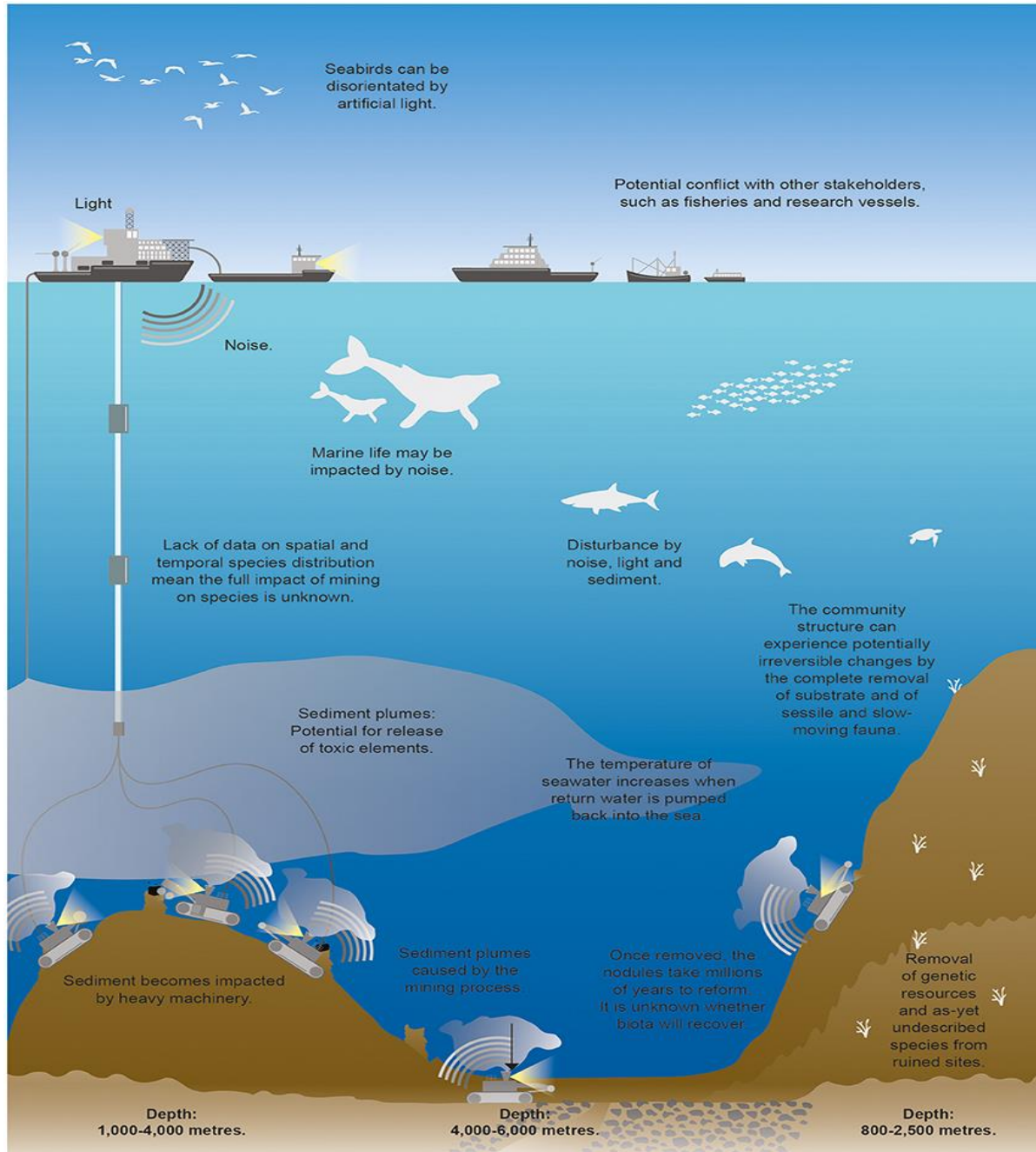


Figure 3: Illustration of seabed mineral mining and its effects on the marine environment.<sup>44</sup>

<sup>43</sup>R.E Boschen *et al* 'Mining of Deep-Sea Seafloor Massive Sulphides: A Review of the Deposits, Their Benthic Communities, Impacts from Mining, Regulatory Frameworks and Management Strategies' (2013) 84 *Ocean and Coastal Management* 54-67.

<sup>44</sup> Miller *et al* (n 39 above).

## 2.3 NAMIBIA'S RESPONSE TO PROPOSED MARINE PHOSPHATE MINING: THE CABINET DIRECTIVE

The Namibian constitution, in terms of Article 46(1)(b), provides that the Cabinet exists for the purposes of administering and executing the functions of the Government. Article 40(a) states that the role of the Cabinet is to direct, co-ordinate and supervise the activities of Ministries and State institutions, with article 40 (k) empowering the cabinet to issue notices and directives in order to facilitate the implementation of just administration action.<sup>45</sup>

Relying on the above proviso, the cabinet used its constitutional prerogative to place a moratorium on conducting MPM. The moratorium was placed by the Minister of Fisheries and Marine Resources for an eighteen month period, with the option of extending it for a further period of three months.<sup>46</sup> Environmental industry associations, such as Swakopmund Matters and The Earth Organisation, played a key role in lobbying for a review of the decision by the Minister of Mines in endorsing MPM.<sup>47</sup> In the light of the above, the Minister of Environment and Tourism, Mr. Shifeta, has tasked an independent scoping study and comprehensive EIA to be aligned with a broader strategic environmental assessment on the Namibian seabed. The scientific studies will be completed by the Norwegian-based Foundation for Scientific and Industrial Research and the Institute for Marine Research.<sup>48</sup> The Cabinet moratorium on MPM provides a prime example of the procedural steps to be undertaken in cases of scientific uncertainty.<sup>49</sup>

## 2.4 OVERVIEW OF THE STATUTORY FRAMEWORK

In the light of the 2002 World Summit on Sustainable Development, governments around the world, including Namibia, produced reports and policy papers.<sup>50</sup> Namibia has established Sustainable Development (SD) departments within Government to integrate economic, environmental and social

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<sup>45</sup> Constitution of the Republic of Namibia (n 23 above).

<sup>46</sup> The Namibian (n 12 above).

<sup>47</sup> G Costella 'Environmental group says marine phosphate mining cannot be sustained by Namibia' 17 May 2013 <http://www.miningweekly.com> (accessed 16 June 2018).

<sup>48</sup> Benkenstein (n 8 above) 1 – 4.

<sup>49</sup> Deep Seabed Mining Campaign 'Namibian Governments Moratorium on Seabed Mining Sets an International Standard in Protecting our Oceans' 24 September 2013 <http://www.cer.org.za> (accessed 1 May 2018).

<sup>50</sup> Plan of Implementation of the World Summit on Sustainable Development, A/CONF.199/20 (4 September 2002), paragraphs 23, 109 (f).

policies. The EMA, MPMA and Benguela Convention are clear signposts of more integrative forms of governance at national level.

The law concerning the regulation of MPM has the purpose of establishing a legal framework applicable to the mining of raw seabed minerals. Mining activities of parties within the Exclusive Economic Zone (EEZ) is subject to the sovereign territorial rights of a country. There is considerable interest in the domestic extractive industry in the commencement of MPM. MPM, therefore, opens up a promising field for the development and commercial utilisation of new technologies. The commencement of MPM, however, necessitates a legal framework which will ensure that the exploration of the seabed does not jeopardise the justified interest of third parties in an unreasonable manner.<sup>51</sup>

It is important to note that there are various stages that statutorily regulate the MPM process, and these are categorised into different rights and permits such as the reconnaissance permission, prospecting right, mining right, retention permit, exploration right, reconnaissance permit, technical cooperation permit, exploration right and production right.<sup>52</sup>

In this regard, a summary of the legislative regime for the regulations of MPM will be discussed. The subsequent chapters will then provide a legal analysis of MPM and precaution in practice.

## 2.4.1 National Legislation

### 2.4.1.1 Environmental Management Act<sup>53</sup>

The EMA is the supreme piece of legislation for environmental management and protection.<sup>54</sup> The EMA reflects Namibia's international obligations with regard to environmental law. The Act gives effect to Article 95(1) of the Constitution which guarantees the right to an environment that is not harmful.<sup>55</sup>

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<sup>51</sup> Territorial Sea and Exclusive Economic Zone of Namibia Act, 3 of 1990.

<sup>52</sup> The Minerals (Prospecting and Mining Act), 33 of 1992.

<sup>53</sup> Environmental Management Act, 7 of 2007.

<sup>54</sup> R Ruppel and E Schlichting *Environmental Law and Policy in Namibia: Towards making Africa the tree of life* (2013) 106 – 131.

<sup>55</sup> Constitution of the Republic of Namibia, Act 1 of 1990.

The EMA imposes a general duty of care for the environment which provides that every citizen has a duty to avoid environmental degradation.<sup>56</sup> The EMA is based on international environmental law principles of SD and environmental management.<sup>57</sup> The EMA provides for listed activities that require prior environmental authorisation for which an EIA is required. The EMA creates institutions and departments responsible for executing the objectives under the Act.<sup>58</sup>

Section 32(1) of the Act provides that a person who is required to obtain an ECC must, on the prescribed form and on payment of the prescribed fee, apply to the EC for an ECC in respect of the listed activity to be undertaken. In sec 32(2) it provides that the applicant must, in the prescribed manner, forward the application referred to in sec 32(1) to the EC if the proponent complies, in respect of the proposed activity, with any requirements prescribed by law in respect of that activity. Taking into account that MPM intends to extract minerals from the environment, it, thus, falls into the category of a listed activity, and, therefore, an ECC is required.

Section 36 of the Act empowers the EC to review an application submitted to the EC in terms of the Act and to take any action the Commissioner considers appropriate for the review of the application, including: (a) consulting any person, institution, or authority on any manner concerning the application, the assessment, or any submission received in relation to the application; (b) carrying out, or appointing a person or a committee of persons to carry out, an investigation, including a process of public consultation, in relation to any matter concerning the application, the assessment or any submission; or (c) holding a public hearing.

Whether or not the proposed activity needs an assessment is then decided by the EC. EIAs are conducted in order to:<sup>59</sup>

- a) Ensure that activities which may have a significant impact on the environment adhere to the principles of environmental management planning and development process;<sup>60</sup>

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<sup>56</sup> EMA (n 53 above) sec 3(2)(l).

<sup>57</sup> EMA (n 53 above) sec 3(2)(a).

<sup>58</sup> EMA (n 53 above) sec 2.

<sup>59</sup> EMA (n 53 above) sec 3(1)(b).

<sup>60</sup> EMA (n 53 above) sec 3(2)(e).

- b) Analyse the possible environmental impacts of activities and look at ways to decrease negative impacts and increase positive ones; <sup>61</sup> and
- c) Ensure that the environmental effects of activities are given adequate consideration before activities are carried out. <sup>62</sup> The role the EC plays is, thus, crucial as the discretion to grant an ECC is vested in him/her.

#### 2.4.1.2 *The Minerals (Prospecting and Mining) Act*<sup>63</sup>

Mineral extraction in Namibia is an important industry.<sup>64</sup> On the African continent, the local extractive industry ranks within the top five industries in terms of export of uranium to the Asian and European markets. The extractive industry generates up to 50% of the country's annual export income.<sup>65</sup>

The purpose of the MPMA is to ensure that the natural resources of the country are used in a sustainable manner, specifically in a national environmental framework policy which protects sensitive environments.<sup>66</sup> The criteria that the Mining Commissioner must consider when exercising his/her discretion include one of ensuring that the prospecting or extracting will not cause harm to the marine environment.<sup>67</sup>

The MPMA provides that the licence holder of the mining right is responsible for any environmental harm which may result from the mining activities. Significantly, this duty extends to damage, pollution or degradation which might occur beyond the boundaries for which such a mining licence has been issued.<sup>68</sup>

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<sup>61</sup> EMA (n 53 above) sec 3(2)(l).

<sup>62</sup> EMA (n 53 above) sec 3(2)(d).

<sup>63</sup> The Minerals (Prospecting and Mining) Act 33 of 1992.

<sup>64</sup> McGregor *et al* 'Beneficiation in Namibia: Impacts, Constraints and Options' November 2017 IPPR Research Report <http://www.ippr.org.na> (accessed 25 May 2018).

<sup>65</sup> Xinhua 'Mining sector to lead Namibia's economic recovery in 2018' 8 November 2017 <http://www.xinhuanet.com> (accessed 25 May 2018).

<sup>66</sup> MPMA (n 63 above) sec 3.

<sup>67</sup> MPMA (n 63 above) sec 5.

<sup>68</sup> MPMA (n 63 above) sec 128.

## 2.4.2 International Instruments

### 2.4.2.1 *The Precautionary Principle: A Rule of International Customary Law?*

Both the nature and the characteristics of the process of the formation of a norm of international custom have been the subject of discussion owing to the advent of the concept of 'precaution' in international law. Clarification as to whether precaution is already part of international customary law and also the modalities and extension in which it would be part of international customary law is an aspect that most assuredly has an impact on the question of the legal nature of this concept and the regime that would be applicable to it in this regard.<sup>69</sup> The Statute of the International Court of Justice (ICJ) defines International Custom as 'evidence of a general practice accepted as law'.<sup>70</sup>

The criteria required in international law for the emergence of a norm of international custom were set out by the ICJ in the North Sea Continental Shelf Cases. These criteria refer principally to the creation of a norm that 'could be regarded as forming the basis of a general rule of law', founded on a 'widespread representative participation', including that of States whose interests are affected, and confirmed through both extensive and virtually uniform practice.<sup>71</sup>

Applying the above criteria, certain principles of precaution have acquired customary international status. As such, these principles, if indeed they are customary international law, are law in Namibia (unless inconsistent with national law). The international law elements of precaution, therefore, influence Namibian law either through actual incorporation or as interpretive guidelines.<sup>72</sup>

### 2.4.2.2 *Current Framework for Sustainable Development and Precaution*

The Brutland Report<sup>73</sup> defines SD as a 'framework for the integration of environmental policies and developmental strategies' and states that 'SD seeks to meet the needs and aspirations of the present

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<sup>69</sup> North Sea Continental Shelf Cases (W. Ger. V. Neth.; W. Ger. V. Den), 1969 I.C.J. 3, 43-44.

<sup>70</sup> Statute of International Court of Justice article 38 para. 1(b).

<sup>71</sup> T Lee 'The Law of the Sea Convention and Third States' (1983) 77 *American Journal of International Law* 541-568.

<sup>72</sup> O Pedersen 'From Abundance and Indeterminacy: The Precautionary Principle and Its Two Camps of Custom' (2014) 3 *Transnational Environmental Law* 323-339.

<sup>73</sup> UNGA, UN DOC A/42/427 (4 August 1987) hereinafter the Brutland Report.

without compromising the ability to meet those in the future.<sup>74</sup> Environmental protection is, thus, inherent in the concept of SD. The Brundtland Report elaborates two related concepts that are central to modern resource analysis: firstly, that tension exists between motives either to exploit or to conserve resources; and, secondly, that the uses of many resources are not effectively regulated by the State. The exploitation-conservation problem can now be addressed with the *intertemporal* analysis to resource allocation. What we do today has consequences for tomorrow.<sup>75</sup> The Brundtland definition promotes two such principles, ‘intra-generational equity’ (between rich and poor people living today) and ‘inter-generational equity’ (between present and future generations).

SD has been integrated into domestic legislation. Article 91(c) of the Constitution sets out the appointment of the Ombudsman. The constitution provides for the integration of SD through the office of the Ombudsman. Notable among this is Precaution. What are the present stocks of economically extractable phosphate minerals? How many species of fish inhabit the sea, and what are the costs of catching them? What are concentrations of noxious substances in the air, in water, and on the land, and how do these impinge on the health of the people, flora and fauna? Future conditions are even more uncertain, yet decisions must be made today that have consequences for tomorrow. In this premise, Article 95(1) provides for the promotion and maintenance of the country’s marine ecosystem.<sup>76</sup>

### 2.4.3 Regional Paper

#### 2.4.3.1 The Benguela Convention

The Benguela Convention, with its head office stationed in Swakopmund, establishes an inter-governmental institution which is responsible for the protection and conservation of the Benguela ecosystem.<sup>77</sup> In addition to that, the main focus is to manage trans-boundary resources at the ecosystem level, rather than having each country acting alone. The convention is the first global Commission to deal with the LME between South Africa, Angola and Namibia.<sup>78</sup> The Benguela Convention commits the

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<sup>74</sup> Brundtland Report paragraph 1 of chapter 2.

<sup>75</sup> K Bosselmann ‘Rio+10: Any closer to sustainable development?’ (2002) 6 *New Zealand Journal of Environmental Law* 297-301.

<sup>76</sup> Constitution of the Republic of Namibia, 1990.

<sup>77</sup> Benguela Convention (n 3 above).

<sup>78</sup> ‘Benguela Current Ecosystem health under the microscope’ 23 March 2017 <http://www.mypr.co.za> (accessed 14 May 2018).

signatories to reduce and control the degradation of the marine ecosystem and minimise the impacts of MPM.<sup>79</sup>

More specifically, the Benguela Convention lists, in article 4, the specific guiding principles, namely: 1) co-operation among the signatories; 2) sustainable use and management of the marine resources; 3) the PP, including undertaking EIAs for activities that might have a negative impact on the marine environment by funding and supporting comprehensive science, training and capacity building programmes; 4) preventing and eliminating pollution and taking steps to protect the marine ecosystem against any adverse impacts; 5) the polluter pays principle; and 6) protecting vulnerable species and biological integrity and improving human capacity and infrastructure. In summary, sound environmental governance, training and capacity building are at the forefront of its agenda.<sup>80</sup>

The Benguela Convention introduces an ‘ecosystem approach to ocean governance’. This entails that the three countries work together to tackle problems that affect the marine environment at a regional level.<sup>81</sup>

## 2.5 CONCLUSION

Why should a study on seabed mineral mining focus on SD? The answer consists of two parts. Firstly, precaution provides a handy structure that can be applied in the various branches of resource economics to reveal the unity of the problems arising in different resource contexts. Take fishing and mining, for example. Fish are not caught with picks and shovels; mining is not done using nets. Yet the problems these two industries must cope with are similar in many respects. Grasping the challenges of one industry makes it easier to understand the challenges of the other industry. Secondly, the rational management of natural resources requires adequate knowledge of those resources, their conservation and rational exploitation. The protection and preservation of the marine environment has acquired greater significance, owing to the increasing demand for resources by expanding populations and the attendant hazards on the environment posed by advances in science and technology.

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<sup>79</sup> N De Paula ‘Angola, Namibia and South Africa Sign Convention on Ocean Governance’ 27 March 2013 <http://www.sdg.iisd.org> (accessed 4 May 2018).

<sup>80</sup> Benguela Convention (n 3 above) article 4.

<sup>81</sup> C Attwood ‘Showcasing Lessons and Experiences from the Benguela Current Commission’ 1 June 2013 <http://www.coast.iwlearn.org> (accessed 15 May 2018).



The UNCLOS has positioned environmental management as an important aspect within the EEZ, an aspect over which the State has the competence to take the necessary measures for prevention, regulation and enforcement of pollution standards and rules.

The domestic mining companies in Namibia have not yet built and operated a commercial ocean mining plant and the present understanding of economics is based entirely on engineering estimates. The costs and profitability projections must also be based on an understanding of how MPM will be taxed and what rules and regulations will be applicable to it. These are the large unknowns today and represent one of the more significant uncertainties for MPM. Nevertheless, there is reason to conclude that MPM is economical. Current economic analysis indicates that, as the demand for commercial fertiliser grows, MPM should be able to occupy an increasingly more important position in the world market. The enormous magnitude of the resource means that physical availability will, for the foreseeable future, place no limitations on the industry's growth. To this end, the environmental principle most relevant to the objective of SD is the PP, and this is discussed in chapter three.

### 3 THE PRECAUTIONARY PRINCIPLE: A FUNDAMENTAL PRINCIPLE OF LAW AND POLICY FOR THE PROTECTION OF THE NAMIBIAN SEABED

#### 3.1 INTRODUCTION

The previous chapter explained the importance of assessing and managing the risks associated with MPM. As the discussion highlighted, the Commission is mandated with the task of balancing marine mineral mining and environmental protection. In order to execute its mandate successfully, it is proposed that the Commission apply the PP to regulate the activities associated with seabed mining.

The concept of precaution is complex. For example: what constitutes ‘a serious threat’? What ‘measures’ should be implemented in cases of environmental uncertainty? Whereas the PP was originally applied to marine pollution, it is now considered in relation to a wide range of activities. Increasing exposure of humans and other organisms to physical agents such as electromagnetic radiation, noise and seismic vibrations also requires a consideration of precaution. Because the PP potentially applies to these activities it affects decision-making across all industries. This chapter is a contribution to this exploration. It aims to provide practical guidance to the Commission on seabed mining that involves application of the PP in practice.

The PP is a policy that addresses risks in matters involving environmental scientific uncertainty. Freestone and Hey argue that the principle developed on account of the constraints of policy in addressing uncertain risks and their potential impact on the environment.<sup>82</sup> In its simplest form, the PP provides that, if there is any potential risk or threat to the environment, the absence of scientific evidence is not a reason for inaction. It is a ‘better-safe-than-sorry approach’ in contrast to the ‘wait-and-see approach’ to environmental protection.<sup>83</sup>

The first part of the chapter sketches a general framework for understanding the PP. As the PP is closely related to the obligation to prevent harm, the interrelationship of the two concepts is discussed. In the

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<sup>82</sup> D Freestone and E Hay (eds) *The Precautionary Principle and International Law: The Challenge of Implementation* (1996) 249-268.

<sup>83</sup> M Ahteensuu ‘The Precautionary Principle in the Risks of Management of Modern Biotechnology’ (2004) 1 *Science Studies* 59-65.

second part, a case study is conducted to note the role that precautionary measures play in practice. The analytical framework, as provided in *Trans-Tasman Resources Marine Consent Decision*, will serve to inform the chapter.

### 3.2 THE RELATIONSHIP BETWEEN PREVENTION AND PRECAUTION: FROM REACTIVE TO PROACTIVE THINKING

Following the common law maxim *sic utere tuo alienum non laedas*, the notion of prevention is used in international law to deal with trans-boundary harm.<sup>84</sup> The obligation to prevent trans-boundary harm was elaborated on in Principle 21 of the 1972 *Stockholm Declaration of the UN Conference on the Human Environment*. The Principle provides that States have, in accordance with the Charter of the UN, agreed to control the emissions of substances into the North Sea which may be harmful to living organisms. This agreement was to apply not only to those substances which were already known to be harmful but also to substances which might be harmful but for which ‘no clear scientific evidence of a causal link between emissions and effects were available’. Such substances were deemed to be those that are persistent, toxic and likely to accumulate in living tissue.<sup>85</sup> This requirement, referred to as the PP, is the first explicit inclusion of the PP in an international agreement.

States are, however, responsible only for activities that are (or can be) proved by evidence or by the existence of foreseeable risks. When scientific evidence does not exist, or when an environmental risk is reasonably foreseeable, the obligation of prevention is, thus, unable to require States to regulate environmental risks. The emergence of the PP was an attempt to fill this gap. The precautionary approach seeks to shift the focus to an earlier point in time. The new element is that of timing rather than the need for remedial action.<sup>86</sup>

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<sup>84</sup> Trail Smelter Arbitral Tribunal Decision 684 US 35 (1994).

<sup>85</sup> Stockholm Declaration (Report of the United Nations Conference on the Human Environment, Stockholm, 5 – 16 June 1972, A/Conf.48/14/Corr. 1, 11ILM 1416).

<sup>86</sup> A Jaeckel *The International Seabed Authority and the Precautionary Principle: Balancing Deep Seabed Mineral Mining and Marine Environmental Protection* (2017) 27.

### 3.3 ADDRESSING UNCERTAINTY: LAW, POLICY AND THE HISTORICAL DEVELOPMENT OF THE PRECAUTIONARY PRINCIPLE

The PP originated from the concept of “*Vorsorgeprinzip*” (translated as the principle of foresight) in German Environmental Law in the 1970s.<sup>87</sup> *Vorsorgeprinzip* ‘prescribes society to engage in study and planning to avoid environmental damage from potentially harmful activities’. Owing to the German proposal, the PP appeared in the 1988 *Declaration on the Protection of the Marine Environment of the Baltic Sea Area*.<sup>88</sup> This was the first time the PP had found its way into international law. The rationale for taking action in advance of the availability of scientific proof of harmful effects was the conviction that policy makers needed to know what is scientifically necessary for long-term, geographically extensive restoration of ocean life and not what scientists believe to be politically feasible.<sup>89</sup>

Arguably, the PP became an essential concept within international environmental policy after the Rio Declaration on Environment and Development. It is the most significantly recognised and accepted international formulation in the field of environmental protection. The Declaration states that:<sup>90</sup>

‘In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, the lack of full scientific certainty shall not be used as a reason for postponing cost effective measures to prevent environmental degradation.’

The premise of the PP is that activities should not be permitted where there is scientific uncertainty regarding their environmental effects and where there is reason to believe that harm may result.

### 3.4 THE CORE MEANING OF PRECAUTION

The most comprehensive analysis is provided by Trouwborst who illustrates precaution by the use of the tripod. The first two are conditions that are necessary to trigger the PP. These are: (1) potential for environmental harm; and (2) uncertainty about the extent of impact. If both of these elements are met,

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<sup>87</sup> K von Moltke *The Vorsorgeprinzip in West German environmental policy* (1987) 57.

<sup>88</sup> Preamble, paragraph 8; hereinafter the Baltic Sea Declaration.

<sup>89</sup> *Ibid.*

<sup>90</sup> ‘The United Nations Conference on Environment and Development’, hereafter the Rio Summit.

the third component, precautionary action, becomes necessary.<sup>91</sup> The explanation of precaution will contain a separate discussion of all three elements of the principle – the three legs of the tripod – in the following order, harm, scientific uncertainty, action.

### 3.4.1 First Leg of the Tripod: Environmental Harm Dimension

The PP applies to conditions in which there is a threat to the environment. The damage dimension concerns harmful results. Examples of used criteria are ‘physical disturbance to the environment through mining, agriculture, logging, construction, dredging waterways and damming rivers altering the physical configuration of ecosystems’,<sup>92</sup> ‘chemical contamination of the environment through accidental or deliberate discharge of toxic substances to land or water, discharge of gaseous pollutants’,<sup>93</sup> and ‘ecological disturbance either as a result of physical or chemical impacts on the environment, or by introduced species or direct disturbance by humans’.<sup>94</sup> According to the PP, when scientific evidence provides reason that an activity may be harmful, measures should be implemented to prevent it. If no precautionary measures are implemented, damage to the marine environment may be irreversible.<sup>95</sup>

### 3.4.2 Second Leg of the Tripod: Scientific Uncertainty Dimension

Randall defines uncertainty as a situation in which we can enumerate the possible outcomes but cannot assign probabilities to them. Under uncertainty it is impossible to calculate expected values, and it is not clear what patterns of choice would count as being consistent and rational.<sup>96</sup> Phrases include ‘lack of full scientific certainty’,<sup>97</sup> ‘before a causal link has been established by absolutely clear scientific evidence’,<sup>98</sup> ‘aspects of the threat that we are unable to predict because we do not have the tools available or the level of knowledge required’.<sup>99</sup> In these cases, decisions are more difficult to make, but the PP requires us

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<sup>91</sup> A Trouwborst ‘Prevention, Precaution, Logic and Law: The Relationship between the Precautionary and the Preventative Principle in International Law and Associated Questions’ (2009) 2 *Erasmus Law Review* 105 – 127.

<sup>92</sup> ‘United Nations World Charter for Nature’ 1982 Principle 11b.

<sup>93</sup> Rio Summit (n 90 above) Principle 15.

<sup>94</sup> ‘Wingspread Conference on the Precautionary Principle’ 2000.

<sup>95</sup> Rio Summit (n 90 above) Principle 15.

<sup>96</sup> A Randall *Risk and Precaution* (2011) 29

<sup>97</sup> Rio Summit (n 90 above) Principle 15.

<sup>98</sup> Rio Summit (n 90 above) Principle 15.

<sup>99</sup> Second International Conference on the Protection of the North Sea 1987.

to try to avoid environmental damage that might be serious or irreversible by putting precautionary measures in place.<sup>100</sup>

### 3.4.3 Third Leg of the Tripod: Precautionary Action Dimension

The precautionary action dimension concerns the measures to be implemented to avoid threats of serious or irreversible harm to the environment. The more significant the threat, the greater the degree of precautionary action is required. This may take the form of ‘reducing the uncertainties so that potential impacts can be re-evaluated’,<sup>101</sup> ‘to stop the activity or modify it to significantly lessen possible environmental impacts’,<sup>102</sup> ‘regulatory action’<sup>103</sup>, ‘use quality systems to limit impacts during mining operation’, ‘develop organisational policies and management approaches that systematically consider long-term environmental impacts before proceeding with activities’.<sup>104</sup>

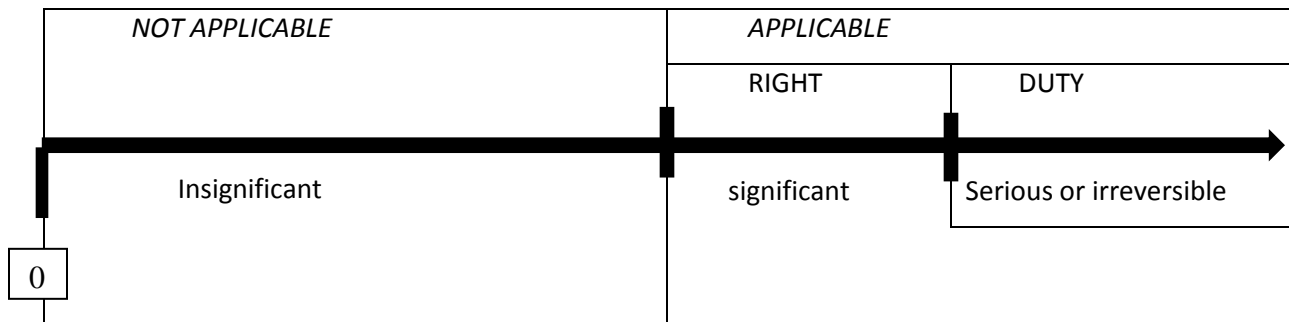


Figure 4: Scale of gravity of harm of with two thresholds. The arrow headed axis represents the scale of gravity. The two boldest printed bars are the thresholds of ‘significant’ and ‘serious or irreversible’ harm. Relevant qualifications of harm are indicated below the axis, and corresponding legal effects above it.<sup>105</sup>

<sup>100</sup> *Ibid.*

<sup>101</sup> Rio Summit (n 90 above) Principle 15.

<sup>102</sup> Rio Summit (n 90 above) Principle 15.

<sup>103</sup> ‘Cartagena Protocol on Biosafety’ 2000, article 10.

<sup>104</sup> A Deville and R Harding *Applying the Precautionary Principle* (1997) 47.

<sup>105</sup> A Trouwborst *Precautionary Rights and Duties of States* (2006) 63. Figure 4 represents a scale of increasing gravity of environmental harm, which is intersected by two threshold bars. On the stretch between zero and the first threshold, environmental damage is characterized as minor. On the stretch above the first threshold bar, international custom grants States the right to take precautionary measures. Finally, on the stretch above the second threshold bar, harm is regarded as significant and irreversible in nature. Under these circumstances, States not only have a right, but a customary duty to undertake precautionary action.

### 3.5 WEAK AND STRONG INTERPRETATIONS OF PRECAUTION IN THE RISK ASSESSMENT OF THE NAMIBIAN SEABED: THE BURDEN OF PROOF

Interpretations of the PP are many, both in terms of wording and structure.<sup>106</sup> The difference between the weak interpretation and strong interpretation arose when the PP found important application in fisheries resource management. It was applied to large-scale pelagic drift-net fishing which was prohibited unless effective management measures could be implemented.<sup>107</sup> Fisheries conservation is rarely included in the preservation of the marine biodiversity. For centuries, scientists were in denial that marine ecosystems could be adversely affected by fishing. It is on these grounds that a more flexible precautionary interpretation was developed through law and policy.<sup>108</sup> Cooney and Dickson argue that, under the PP, the ‘onus of proof’ regarding impact shifts to those whose conduct may cause harm to the environment. Such people are required to provide scientific evidence that their actions will not have serious or irreversible impact on the environment.<sup>109</sup>

#### 3.5.1 Weak Interpretation

The weak (inclusive) interpretation provides that a lack of full scientific certainty is not a reason for preventing an activity that may cause environmental damage. If there are appropriate justifications for an activity, such as risk assessment and risk management margins being included, then an extractive activity may proceed.<sup>110</sup>

From an international perspective, a weak interpretation of the principle is observed in Principle 15 of the Rio Declaration, stating that:

‘...[w]here there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost effective measures to prevent environmental degradation...’<sup>111</sup>

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<sup>106</sup> D Turner ‘The Lack of Clarity in the Precautionary Principle’ (2004) 13 *Environmental Values* 449-460.

<sup>107</sup> UNGA, UN DOC A/44/225 (22 December 1989), para 4.

<sup>108</sup> A Weier, and P Loke, ‘Precaution and the Precautionary Principle: two Australian case studies, Productivity Commission Staff Working Paper, Melbourne’ (2007).

<sup>109</sup> R Cooney and B Dickson *Biodiversity and the precautionary principle: risk and uncertainty in conservation and sustainable use* (2005) 1 – 10.

<sup>110</sup> MD Rogers ‘Risk analysis under uncertainty, the Precautionary Principle, and the new EU chemicals strategy’ (2003) 37 *Regulatory Toxicology and Pharmacology* 370-381.

<sup>111</sup> Rio Summit (n 90 above) Principle 15.

In addition to the above, The UN Framework Convention on Climate Change (1992) uses ‘negative language’ in the interpretation of precaution. The Convention provides ‘that Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects.’<sup>112</sup>

With reference to national legislation, section 3(2)(k) of the EMA constitutes a weak version of the PP by stating that ‘where there is sufficient evidence which establishes that there are threats of serious or irreversible damage to the environment, lack of full scientific certainty may not be used as a reason for postponing cost-effective measures to prevent environmental degradation.’<sup>113</sup>

Kambonde argues that sec 3(2)(k) of the EMA provides a weak interpretation of the PP. Even though it places a high threshold on the acceptable risk required to trigger the operation of the principle, it nonetheless requires the threats of danger to be established by scientific evidence which suggests that the likelihood of occurrence and the severity of inaction should be shown.<sup>114</sup>

### 3.5.2 Strong Interpretation

Soule’s analysis shows that, in strong (narrow) environmental interpretation, risk requires that authorities respond through precautionary actions.<sup>115</sup> A frequently quoted strong interpretation of the PP is provided in the Wingspread Statement. This statement provides that if there is good reason to suspect that the extractive activity will cause serious or irreversible damage to the environment, strict precaution should be applied. In this case, the precautionary measure would be to stop the extractive activity from proceeding or suspend it until enough scientific evidence has been collated to reduce the uncertainties.<sup>116</sup>

Because MPM poses the potential of irreversible harm to the environment and entails scientific uncertainty, measures must be taken to protect the marine environment in the form precaution. These

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<sup>112</sup> ‘United Nations Framework Convention on Climate Change’ 1992.

<sup>113</sup> EMA (n 53 above) sec 3(2)(k).

<sup>114</sup> Unpublished: SL Kambonde ‘A critical analysis of the Namibian Seabed Phosphate Mining Moratorium from an Environmental Law Perspective’ unpublished LLM thesis in Oil, Gas and Mining Law, Nottingham Trent University, 2015 64-84.

<sup>115</sup> E Soul ‘Assessing the Precautionary Principle’ (2000) 14 *Public Affairs Quarterly* 309.

<sup>116</sup> ‘Wingspread Conference on the Precautionary Principle’ 2000.



measures should reflect the levels of uncertainty and the possibility of harm, as determined by a participatory process, and they can range from a moratorium on MPM, in one extreme case, to the monitoring of extractive activities only. The *Trans-Tasman Resources Marine Consent Decision* seems to have implications for the application of precaution.

### 3.6 CASE STUDY TRANS-TASMAN RESOURCES MARINE CONSENT DECISION<sup>117</sup>

#### 3.6.1 Introduction

The case study examines the judgement by the New Zealand Decision-Making Committee (DMC) of the Environmental Protection Authority (EPA). The DMC considered the application for marine consent to undertake iron ore extraction and processing operations in terms of the EEZ Act.<sup>118</sup>

#### 3.6.2 Background

In its EIA for marine consent, the TTR, a New Zealand company formed to explore and develop the country's iron sand deposits, had sought final approval to excavate up to 50 million t/per year of seabed but the application was dismissed by the DMC of the environmental agency.<sup>119</sup>

#### 3.6.3 Statutory Framework

The DMC refused marine consent. The basis of the decision by the DMC was based on the following factors:

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<sup>117</sup> 'Environmental Protection Authority, Trans-Tasman Resources Ltd Marine Consent Decision, June 2014' [http://www.epa.govt.nz/EEZ/EEZ000004/Trans\\_Tasman\\_Resources\\_decision\\_17June2014](http://www.epa.govt.nz/EEZ/EEZ000004/Trans_Tasman_Resources_decision_17June2014) (accessed 9 June 2018).

<sup>118</sup> *Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012*, No. 72 (2012) (New Zealand). Under section 38 of the Act, any person may apply to the EPA for a marine consent to undertake a discretionary activity defined in Article 36 and described in the *Exclusive Economic Zone and Continental Shelf (Environmental Effects – Permitted Activities) Regulations 2013*.

<sup>119</sup> Trans-Tasman Decision (n 117 above) para 13 and 27.

- a) The requirement of the DMC to favour caution and environmental protection in the light of scientific uncertainty by using the best available information under sec 61(2) is, in the view of the DMC, ‘not to be traded off against the attainment of economic wellbeing’.<sup>120</sup> The application did not address the concerns of the DMC with reference to uncertainties relating to potential benthic effects on the ecosystem, fishing interest and the life-supporting capacity of the marine ecosystem in New Zealand.
- b) In a similar vein, the DMC concluded that the qualifying words ‘the importance of protecting...’ that appear in sec 59(2)(d) and 59(2)(e) were chosen deliberately by law-makers.<sup>121</sup> ‘[T]he protection of rare and vulnerable ecosystems and the habitats of threatened species’, therefore, need to be given more weight than other matters listed under section 59(2).<sup>122</sup> The TTR had not done its homework on the full environmental impact of digging up 50 million t of seabed every year for 20 years. The EPA was not satisfied that the life-supporting capacity of the environment would be safeguarded given the uncertainty and inadequacy of the information presented. For all of these reasons, the application as presented was uncertain with reference to environmental performance objectives of the marine ecosystem and did not meet the SD goals of the Act. The DMC, therefore, ruled in favour of environmental protection and caution.

#### 3.6.4 Judgment

The Trans-Tasman Decision has a few important implications for MPM in Namibia. Firstly, information on environmental impact and other existing traditional interests is a prerequisite for MPM activities.<sup>123</sup> In particular, longitudinal baseline monitoring data extending over at least a few years (as opposed to modelled information) is essential. Secondly, trade-offs between investment certainty and the adaptive management approach will need to be taken into consideration by the extractive industry. MPM may need to take greater risk by accepting a scaled staged implementation, but this may render the industry commercially unviable. Thirdly, the extractive industry will need to offer a fair share of economic benefits

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<sup>120</sup> Trans-Tasman Decision (n 117 above) para 139.

<sup>121</sup> Trans-Tasman Decision (n 117 above) para 106.

<sup>122</sup> EEZ (n 118 above) sec 59.

<sup>123</sup> ‘Papua New Guinea Mine Watch ‘NZ no to seabed mining a cautionary tale for the Pacific’ 25 June 2014 <http://ramumine.wordpress.com> (accessed 24 April 2018).

to the host community and the national economy. Economic benefits, through taxes and royalties alone, were deemed insignificant in this case, especially in the face of large uncertainties in terms of adverse economic effects on existing interests such as fisheries.<sup>124</sup>

### 3.7 CONCLUSION

Erickson describes the concern for the environment as an ‘environmental revolution.’ Many of the elements of this revolution, which were proclaimed over the years by conservationist and only recently catapulted into public acclaim, have been translated into executive, legislative and judicial action. In the process, it is clear that what may have begun as a revolution against thoughtless exploitation of natural resources of our physical environment has evolved into an environmental ethos that calls for the assessment of the effects of human activities on the total environment of man.<sup>125</sup>

As illustrated above, the PP mirrors the framework of the type of risk, the degree of scientific uncertainty, the criteria that should be considered in the decision making process (proportionality and cost-effective analysis), and a shifting of a burden of proof. Expected value and expected utility analysis are appropriate to cope with in uncertainty. Moreover, standard expectation analysis is not useful for irreversible catastrophes of large consequence, but of low probability of occurrence. Intertemporal economics constructed on the assumption of certainty seems sufficiently challenging and rewarding for precautionary action.<sup>126</sup> In chapter four, the implementation of precaution and the challenges thereof are discussed.

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<sup>124</sup> *Argentina v Uruguay* ICJ (1 February 2011) Judgment. ICJ Reports 14-107 at 71.

<sup>125</sup> PA Erickson *Environmental Impact Assessment: Principles and Applications* (2000) 3 – 19.

<sup>126</sup> PA Neher *Natural Resource Economics: Conservation and Exploitation* (2005) 9 – 11.

## 4 IMPLEMENTING THE PRECAUTIONARY PRINCIPLE: PERSPECTIVES AND PROSPECTS

### 4.1 INTRODUCTION

The debate in chapter three was centered on the definition of precaution and how to address uncertain environmental risks. It provided that the PP has many interpretations which range from weak/inclusive to strong/narrow. The chapter concluded that the PP has been included in almost all recent national and international literature. The wealth of attention can be attributed to the fact that the question of how to manage man-made risks remains a contentious issue.<sup>127</sup>

This chapter looks at the PP and its implementation in the realm of the MPM. In particular, it explores the challenges faced by the Commission when implementing the PP, including its role in risk assessment and risk management. The author argues that a greater focus on alternative assessment can enhance the ability of the regulator to make precautionary decisions and stimulate innovation towards SD. The analysis is interdisciplinary, employing perspectives from public policy, law and the earth sciences with a view to improving the effectiveness of policy at regional level. The analytical framework notes that implementing the PP is not just a case of inserting it into law but rather recognizing that it requires adjustments to institutional capacities. The first part of the chapter investigates the three dimensions involved in the implementation of precaution, and the second part outlines the challenges associated with implementing the identified dimensions.

### 4.2 THE PRECAUTIONARY PRINCIPLE AND ADMINISTRATIVE CONSTITUTIONALISM: THE DEVELOPMENT OF THE THREE DIMENSIONS OF IMPLEMENTING PRECAUTION

#### 4.2.1 The Institutional Dimension

Fisher and Harding argue that implementing the PP includes an institutional dimension. The evaluation of environmental risks and their implementation involves an administrative body. The Benguela Commission requires environmental due diligence before the signatories undertake activities which might be harmful to the environment. Environmental due diligence is defined as using all reasonable foresight and care in

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<sup>127</sup> A Arcuri 'The Application of the Precautionary Principle in Practice: Comparative Dimensions' (2010) 2 *Cambridge University Press* 408.

planning and carrying out our activities so that the harmful impact on the environment is minimised or prevented. One of the aims of environmental due diligence is to establish systematic processes to identify environmental hazards involving current or anticipated activities that may result in environmental harm continuously. This allows the Commission to improve its environmental performance, demonstrate due diligence and apply the PP where applicable.<sup>128</sup>

From a regional perspective, The Benguela Convention, in terms of Article 9, provides for the appointment of permanent committees. The committees comprise of the ecosystem advisory committee, finance and administration committee and a compliance committee. The committees are mandated with the task of providing advice and recommendations to the Commission on matters within their respective areas of competence and of carrying out such activities as requested from time to time by the Commission. This institutional measure by the Commission ensures the monitoring and the enforcing of protective measures for the sustainability of the Atlantic Ocean.<sup>129</sup>

#### 4.2.2 The Procedural Dimension

In order to trigger precaution, there needs to be a certain level of uncertainty with regard to the probability, the scope and degree of environmental impact. Corbyn and Niland advocate the development of a set of specific operations which are in line with the objectives of the PP. This fundamental shift in policy will require a significant change to environmental protection.<sup>130</sup>

On the other hand, Freestone and Hey highlight procedural dimensions to include the possibility of placing the onus-of-proof on those who are proposing potentially damaging environmental activities. By making this shift, those proposing an activity become responsible for providing scientific evidence that the activity they are pursuing, and the manner in which they intend to pursue it, will not pose a threat to the environment.<sup>131</sup>

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<sup>128</sup> E Fisher and R Harding 'The Precautionary Principle and Administrative Constitutionalism: The Development of Frameworks for Applying the Precautionary Principle' in E Fisher (ed) *Implementing the Precautionary Principle: Perspective and Prospective* (2006) 1 – 16.

<sup>129</sup> Benguela Convention (n 3 above) article 9.

<sup>130</sup> L Corbyn and J Niland *The precautionary principle: A NSW status report* (1993) Paper presented to the Precautionary Principle Conference, Institute Environmental Studies, University of New South Wales, Sydney, Australia, 20-21 September 1993.

<sup>131</sup> D Freestone and E Hay (n 82 above) 249 - 368.

Rothwell and VanderZwaag propose that legislation should be increasingly directed at encouraging pollution reductions. One suggestion might be placing deposits on recycled material to promote recycling, while another might be placing green taxes on materials which are non-renewable to discourage their use.<sup>132</sup>

On a national level, the most important procedural dimension is provided in the EMA through the application of EIAs. This procedure is an assessment which is used to assess the impact that the planned activity will have potentially on the environment before the environmental action is given the green light to proceed. The idea behind the EIA is to anticipate environmental problems before they occur and to change the plans accordingly to reflect the need for environmental protection.<sup>133</sup>

#### 4.2.3 Protective Measures

The PP has become an established feature of environmental protection. Gongalves argues that the protective measures provide for the operational implementation of the PP in public decision-making. According to Gongalves, the Commission can undertake programmes for continuous improvement as an indirect precautionary measure. This entails monitoring or auditing current environmental performance and improving this performance across a range of indicators. Continuous improvement involves a policy commitment to regular and thorough updating of all operational and management activities. Steps to implement policies for improved performance can be undertaken by both the extractive industry and the Commission.<sup>134</sup>

### 4.3 THE THREE DIMENSIONAL ASSESSMENT OF THE IMPLEMENTATION OF PRECAUTION

The different definitions of precaution in existing policy and international literature create problems for the implementation of the PP. Given this reality, a journey toward ecosystem management and SD is one of reform and change. More specifically, it is a journey of changing how we make decisions about how we

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<sup>132</sup> DR Rothwell and DL VanderZwaag 'Towards Principled Oceans Governance: Australian and Canadian Approaches and Challenges' (2006) 19 *Journal of Environmental Law* 426-429.

<sup>133</sup> EMA (n 53 above) sec 32(1).

<sup>134</sup> V Gongalves 'The Precautionary Principle and Environmental Risk Management' (2013) 4 *Ambiente & Sociedade* 121 – 140.

should live with one another, with future generations and the reality of our interdependencies with our environment. Precaution calls for changes in how we approach nature, science and politics. The overriding goal of administrative constitutionalism is to help the reader understand the critical role that the Commission plays in linking people and natural resources and also to show that institutional reform is needed if we are to progress towards sustainability. To this end, controversies in the application of precaution by the Commission are discussed.

#### 4.3.1 The Role of Values

Dineen argues that natural resources and environmental decision-making have become increasingly complex and technical. Of particular importance are the changing roles of participants. Primary participants in both representative government and representative interest groups are the interest groups and government agencies themselves. The citizens affected by the decisions made by the institutions have often not had direct access to the process of decision-making. For this reason, two related problems have developed. Firstly, one community value has been pitted against another where there is a struggle between values of economic liberty and values of environmental integrity. Secondly, natural resource decision-making has become very procedural. Both administrative and judicial checks on administrative and legislative processes are predominantly process orientated.<sup>135</sup>

#### 4.3.2 Making Uncertainties Explicit

Peel argues that uncertainty may arise from not knowing whether the type of scientific knowledge and the questions posed by scientists are sufficient for the extractive industry and the social context in which the knowledge is applied through policy commitments. Both ignorance and uncertainty may exist at all times in our knowledge about the effects of our activities, no matter how certain we think we are, because we cannot know what we cannot know. This does not mean that development should halt. It means that the Commission should apply precaution at all times, even when the Commission may think it knows the extent of the environmental impact. The PP requires the environment to be given the benefit of the

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<sup>135</sup> N Dineen 'Thinking through the distinction between the precautionary principle and the precautionary approach in theory and practice' (2013) 31 *Politics and the Life Sciences* 2-21.

doubt.<sup>136</sup>

### 4.3.3 Participation

Grandjean *et al* argue that the external regulation of local interdependencies is an institutionally preempting rather than institutionally enabling policy regime. External regulation deprives local communities of the discretion to be able to address their own problems, and, in the process, deprives them of the opportunity to develop productive local institutions. Instead, it creates a relationship of dependency in which individuals in the local community depend on external authorities to solve their problems for them. Local institutional capacity is stunted, instead of being developed over time.<sup>137</sup>

### 4.3.4 Transparency

The Gongalves model includes scenarios where the interests of all stakeholders are not represented. It is the right of each party to represent itself in the decision-making process, and it is the responsibility of each party to help represent the interests of other parties. An important factor that influences the success of collaborative activities is the extent to which all stakeholders are able to develop trust in the decision-making process. For example, in a lengthy study of communities in Italy, Putnam found that the quality of life, community development and social capital were the most developed where there have been horizontal forms of decision-making and communication as are found in collaborative process.<sup>138</sup>

## 4.4 CONCLUSION

The phrase 'SD' has been implied numerous times in this chapter. This term is used to underline the importance that sustainability is a never-ending social process that must involve affected individuals and groups. The intention of this chapter has been to help the reader understand more effectively why, from

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<sup>136</sup> J Peel 'Interpretation and Application of the Precautionary Principle: Australia's Contribution' (2009) 18 *Review of European Community and International Environmental Law* 1-35.

<sup>137</sup> Grandjean *et al* 'Implications of the Precautionary Principles in research and policy making' (2004) 45 *American Journal of Industrial Medicine* 382-385.

<sup>138</sup> Gongalves (n 134 above) 121-140



an institutional perspective, past practices by the Commission have not been sustainable and that reform will require considerable time and commitment.

Progress will necessitate considerable leadership by the Secretariat in organising the Commission to a sustainable end. Such organisation will require re-thinking and re-building institutional approaches regarding natural resource use. This restructuring will require a collaborative approach and expanded stakeholder involvement. Natural resource and environmental management agencies should assume more significant roles in initiating and facilitating collaborative problem solving, collaborative planning and mediation. Simultaneously, such agencies would also sharpen their competitive advantage of collecting and managing technical information and making such information available to all stakeholders.<sup>139</sup>

Establishing an efficient and effective compliance system, in terms of an environmental assessment programme, is recommended for this extractive industry. The effectiveness of this precautionary measure is discussed as a recommendation to this legal conundrum in chapter 5.

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<sup>139</sup> A Randall *Risk and Precaution* (2011) 193 – 217.

## 5 CONCLUDING REMARKS AND RECOMMENDATIONS

This study has shown that the exploration of seabed minerals on the continental shelf is regulated by the State. The exercise of authority over its natural resources provides that Namibia has exclusive authority to explore and exploit seabed minerals within the 200-mile resource zone. The national laws with respect to the appropriation of seabed resources have been supplemented by the signing of the Benguela Convention. The conclusion of the Benguela Convention has placed additional and restrictive conditions on the signatories in the exercise of their freedom to explore and exploit the natural resources. The basis for the restrictions is based on the international customary law principles of transboundary harm.

In assessing MPM within the continental shelf, two facts are admitted. Firstly, MPM is an emerging extractive industry and, secondly, the activity may have adverse effects upon established lawful uses of the sea. It poses significant risk for the marine ecosystem and biodiversity. In light of the risks which MPM has on the environment, the Commission should apply the PP now, before MPM commences. The study has demonstrated that the PP is a very important tool in addressing scientific uncertainty. The moratorium by the Namibian Cabinet has a binding effect on all stakeholders and, therefore, the extractive industry should refrain from carrying out any exploration activities until the independent scoping study is completed to establish the impact of MPM on the environment.

In resolving the conflicting interest, a balancing process must be employed by the Commission. The study recommends that MPM be permitted at the development phase when environmental assessment programmes (EAPs) are conducted for each mining project. The novelty of MPM is an industry which is evolving to permit new ocean activities. With technological advances and changing economic realities, it is becoming increasingly likely that MPM will commence on the Namibian continental shelf in the near future. The adoption of EAPs are discussed as follows.

### 5.1 AN OVERVIEW OF ENVIRONMENTAL ASSESSMENT: PRINCIPLES AND APPLICATIONS

If favouring precaution and environmental protection means that MPM is likely to be declined, the Commission should consider whether adopting an EAP would allow MPM to be undertaken. In this premise, the author recommends that a policy dealing with EA be incorporated into the Benguela Convention.

While a universal definition of environmental assessment does not exist, the definition per Berish *et al* is representative. The purpose of EA is to contribute to the long term sustainability of an ecosystem through the credible evaluation of the ecological effects of human activities on natural systems. The regional EA for the Benguela Convention will recognise the interrelationship between the physical natural environment and the signatories. This relationship balances on the environmental and economic attributes of a region by linking the goals of environmental protection and economic development. The regional EA approach incorporates ecological, economic, social and cultural values into the assessment process. At a regional scale, the EA approach provides an understanding of potential issues and community concerns in the area. This provides an opportunity to identify community issues and target specific indicator stresses to restore or sustain ecosystem integrity and desired conditions.<sup>140</sup>

## 5.2 THE ENVIRONMENTAL ASSESSMENT PROGRAMME

Erickson identifies four main stages in the preparation of an EA.<sup>141</sup>

### 5.2.1 Stage One: Setting Up The Environmental Assessment Team

The Secretariat in the Commission should identify a project manager to lead the EA team. The project manager is responsible for setting up accommodation, site access, transport and equipment if the EA team has to work away from their offices.

The project manager is responsible for selecting consultants, preparing their briefs, finalising their employment contracts and defining their functions in the team. As soon as the responsibilities have been agreed on and recorded, the project manager should finalise the overall schedule and budget of the project. Each consultant then gets his/her own team together, working out his/her own programme and budget, allocating staff to each section of the project and recruiting to fill gaps in his/her expertise if necessary.

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<sup>140</sup> Berish *et al* 'Conducting Regional Environmental Assessments: The Southern Appalachian Experience' in JD Peine (ed) *Ecosystem Management for Sustainability: Principles and Practices Illustrated by a Regional Biosphere Reserve Cooperative* (2001) 117 - 123.

<sup>141</sup> Erickson (n 125 above) 71 – 119; 207 – 226 and 322 – 331.

With reference to data control, each consultant is responsible for the capturing of data and ensuring that the data is available to other consultants. In this regard, all consultants will be aware of one another's work in order to avoid lacunae, anomalies and contradictions.<sup>142</sup>

## 5.2.2 Stage Two: Survey of Existing Material

The existing physical, social, and financial environment must be established before any assessment of future effects can be made. Surveying is divided into two categories: firstly, fieldwork which includes surveys, trail holes, photographs and interviews; and, secondly, recorded data by the local authority within which the mining activity will take place.

With reference to field work, there should be coordination among the consultants as to the format in which the data is presented, e.g. if hectares are to be the area unit, all consultants should use hectares, and not acres. In addition to this, all maps should be prepared to the same scale and from the same survey base.

With reference to recorded data, it is advised that the project manager contact the Local Authority within which the proposed MPM will take place to obtain information on Geological Survey maps, conservation areas, local bye-laws, policies on environmental protection and policies on offshore pollution control.

With reference to participation, it is essential that the local authority, fisheries stakeholders and the indigenous community be consulted about the proposed mining activity. The local authority should be kept informed about the environmental effects of MPM as these will influence their policies and programmes. Mining activities result in increased traffic and additional housing, and, so, the mining company has to purchase land from the local authority and footpaths, railway lines and roads have to be re-routed.

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<sup>142</sup> Erickson (n 125 above) 71 – 84.

The indigenous community and environmentalists have to be consulted about the proposed development and its probable environmental consequences. At the time of public participation, MPM is still being assessed, and the public must be reminded that the final project design may change from the original outline submitted to the local authority when all the environmental effects and their mitigations have been taken into account. Public meetings, where the project can be shown and questioned, should be arranged with the local authority.<sup>143</sup>

### 5.2.3 Stage Three: Environmental Effects

Environmental effects for MPM can be estimated only. The environment current at the time of the study is the baseline for predicting effects *vis-a-vis* the state the environment would be in if the proposed MPM did not take place. Only if both these projections are taken into account, can a true judgment of the probable effects be achieved. Reasonable forecasting of predictions for environmental effects should also be incorporated by the consultants. In cases of long term forecasts, predictions should take into account changes in local authority policies and national legislation. Any significant indirect impact of MPM should also be outlined by the consultants.

Simultaneously, the consultant should outline what measures will be taken to reduce the environmental effect of MPM. The team should advance any beneficial effects of MPM in order to show the benefit of the project. A beneficial effect may not directly cancel out a direct environmental impact on the environment, but a demonstration of the overall balance of effects may make the project more acceptable to opposing parties. Co-operation with the local authority at this stage will help the consultant to determine what mitigation measures are acceptable and how they should be implemented.<sup>144</sup>

### 5.2.4 Stage Four: The Environmental Statement (ES)

Each consultant prepares his/her own professional statement covering his/her survey work, analysis and

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<sup>143</sup> Erickson (125 above) 87 – 119.

<sup>144</sup> Erickson (n 125 above) 207 – 226.

conclusions on the predicted effects within his/her field. The project manager then compiles a single assessment document. When the ES has been completed, copies have to be provided to the Secretary of the Commission and the local authority. The planning committee within the Commission will then make the final decision on the proposed extractive industry.<sup>145</sup>

There is still a considerable problem to be resolved when the EAP has been completed and the ES is in the hands of the decision-making committee for either approval or rejection of the proposed MPM. How does a not-very-well-off authority find the money to pay for experts of equal calibre and experience to those of the mining company in order to examine the material contained in a probably enormous volume of data and its resultant findings? The fishing industry and environmentalists have even fewer resources to set up a proper check on the ES. So far neither the signatories to the Benguela Convention nor the Commission have put forward a solution to this problem. Unless it can be resolved, the value of ES will be reduced because of a lack of competent judgment.<sup>146</sup>

In conclusion, the Erickson model has identified a four-step analytical procedure to provide for the general framework on how to assess environmental conditions. The analysis includes (1) defining the issues and key questions of concern (2) establishing existing environmental conditions (3) referencing the identified baseline conditions and (4) interpreting the findings. Throughout the EA, key stakeholder involvement is required for success. Subsequent to regional EA process, the community identified assessment endpoints can be managed to protect the integrity and health of the marine ecosystem. Integration of specific stressors in the region provides the basis for targeting specific areas at risk. Thus, the integration creates a foundation on which to build greater understanding of ecosystem stressors and human influencers that may be contributing to the degradation of a specific site. In this respect, the EA utilises the information obtained at a broad scale to highlight potential stressors. Risks can then be managed for ecosystem integrity and health.<sup>147</sup>

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<sup>145</sup> Erickson (n 125 above) 322 – 331.

<sup>146</sup> R Churchill (eds) 'The Legal Framework for the Protection of the Marine Environment' in Rayfuse R (ed) *Research Handbook on the International Marine Environmental Law* (2016) 3 – 31.

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This study has provided an in-depth analysis of the Commission's mandate, and the manner and extent to which the Commission is implementing the PP in its current regulatory framework. The discussion has focused on the exploration phase for seabed minerals and has both highlighted the strengths of the current framework and identified and examined lacunae, in particular with respect to the Commission's decision-making procedures. Addressing these shortcomings is critical in the light of the impending commencement of the first MPM Licence granted by the Minister of Mines and Energy. As this study has demonstrated, incorporating the PP – or indeed tools such as EAs - has little meaning unless the Commission's procedural and institutional frameworks are designed to facilitate the implementation of these tools. To inform the development by the Commission of the regulatory and institutional framework for commercial-scale seabed mining, this study has identified several protective measures as well as procedural and institutional dimensions which the Commission could adopt. These could help to ensure that the Commission fulfils its environmental mandate and lives up to its responsibility to ensure a precautionary approach to MPM on the continental shelf in the region.

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