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Maritime spatial planning in South Africa : a nexus between legal, economic, social and environmental agendas

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MARITIME SPATIAL PLANNING IN SOUTH AFRICA: A NEXUS BETWEEN LEGAL, ECONOMIC, SOCIAL AND ENVIRONMENTAL AGENDAS

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DECLARATION

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

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"Don't reject anyone on account of today because tomorrow is a mystery, if you reject one because of his weakness, you also reject his strength", TB Joshua.

ABSTRACT

Title of Dissertation: **MARITIME SPATIAL PLANNING (MSP) IN SOUTH AFRICA: A NEXUS BETWEEN LEGAL, ECONOMIC, SOCIAL AND ENVIRONMENTAL AGENDAS**

Degree: **MSc**

In this study, an exploratory approach into understanding Maritime Spatial Planning and its applicability in South Africa is conducted. Detailed layout on current legal regimes governing marine environment and maritime activities is drawn. Maritime Spatial Planning is viewed as a tool to arbitrate current imbalances between economic, environmental and social agendas whilst arresting future ocean space user and use conflicts.

Notwithstanding the fact that in South Africa, Maritime Spatial Planning development plans were initiated for the purpose of conserving biodiversity and ecosystem; this study is however advocating for economic growth to become the cornerstone of such an innovation. The National Development Plan visions for 2030 evokes South Africa to develop strategic frameworks for sustainable environmental and inclusive economic growth; and Maritime Spatial Planning development is seen as a tool to coordinate and harmonize cooperation amongst different maritime investors. Arguments are made in this study that Maritime Spatial Planning development has the potential to turn South Africa into a maritime economic country. Although there are challenges such as lack of scientific and technical skills pool, case studies conducted for Germany, China and the United States indicate that the cost of not implementing Maritime Spatial Planning will in the future deprive South Africa's realization of the true economic capital that can be generated from maritime resources.

With the current environmental legal regime, this study argues that South Africa can afford to radically and progressively reform its policies towards economic growth related regimes whilst maintaining the balance between environment and social integrity.

KEYWORDS: Ocean Governance, Maritime Spatial Planning, UNCLOS, Regulations, Education, Maritime Policy, Stakeholders Engagement, Economic Development and Growth, Legislation, Environmental Integrity, Sustainable Development, National Development Plan (NDP), Public-Private Partnerships, Maritime Space Use, Africa Maritime Domain

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LIST OF ABBREVIATIONS

AAPA	American Association of Port Authorities
ADZ	Aquaculture Development Zone
AMD	African Maritime Domain
AU	African Union
BRICS	Brazil, Russia, India, China and South Africa
BSH	Federal Maritime and Hydrographic Agency of Germany
BWM	Ballast Water Management Convention
CIA	Central Intelligence Agency
CSIR	Council for Scientific and Industrial Research
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DMR	Department of Mineral Resources
DoE	Department of Energy
DoT	Department of Transport
DST	Department of Science and Technology
EBM	Ecosystem Based Management
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EKC	Environmental Kuznets Curve
ERM	Environmental Resources Management
ESKOM	Electricity Supply Commission (South Africa)
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GAIRS	Generally Accepted International Rules and Standard
GBRMP	Great Barrier Reef Marine Park
GDP	Gross Domestic Product
ICM	Integrated Coastal Management
ICU	Intensive Care Unit
IEKP	Integrated Energy and Climate Programme
IMO	International Maritime Organisation
IUU	Illegal Unreported and Unregulated (Fishing)
LME	Large Marine Ecosystem
MARPOL	International Convention for the Prevention of Pollution from Ships
MFZ	Marine Functional Zone
MLRA	Marine Living Resources Act
MPA	Marine Protected Area
MSP	Maritime Spatial Planning
MW	Megawatt
NDP	National Development Plan
NEMA	National Environmental Management Act
NEMO	National Environmental Management of the Ocean
NGO	Non-Governmental Organizations

NM	Nautical Mile (Equals 1.8520 Km)
NPA	National Ports Act
NPC	National Planning Commission
OBEA	Orange Basin Exploration Area
OCRM	Ocean and Coastal Resource Management
OECD	Organization for Economic Co-operation and Development
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
PetroSA	Petroleum, Oil and Gas Corporation of South Africa
PPP	Private-Public Partnership
SAMP	Special Area Management Plan
SAMSA	South African Maritime Safety Authority
SANBI	South African National Biodiversity Institute
SAWS	South African Weather Service
SEA	Strategic Environmental Assessment
SOA	State Oceanic Administration
TAC	Total Allowable Catch
TEU	Twenty-Foot Equivalent
TNPA	Transnet National Ports Authority
UNCLOS	United Nations Convention on the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
UNESCO-IOC	United Nations Educational, Scientific and Cultural Organization-Intergovernmental Oceanographic Commission
US	United States of America
WWF	World Wide Fund
ZAR	South African Rand

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Chapter 1

The concept of Maritime Spatial Planning

1.1. Background and Introduction about South Africa

South Africa is a member State to the International Maritime Organization (IMO) community and has ratified the United Nations Convention on the Law of the Sea (UNCLOS). It is imperative that South Africa, a member State as it is; morally observes and undertake practices as regulated by these normative international frameworks. South Africa has full sovereignty over its territorial seas; however, this is counterbalanced by the provision as articulated in Article 7 of UNCLOS which gives right of innocent passage to foreign ships over its waters. In other maritime zones such as the Continental Shelf, Exclusive Economic Zone (EEZ) and Contiguous Zone; South Africa has laws enacted allowing her the rights to exploration and exploitation of both living and non-living natural resources. Other obligation as stipulated in the South African Maritime Zones Act No.15 of 1994 is to protect both these resources and the marine environment for sustainable future use.

The South African jurisdiction's promulgation for monitoring, control and enforcement of its authority is over the maritime zone to the equivalent of 4.34 million km^2 of assets. South Africa has the third longest coastline in Africa. According to the Central Intelligence Agency (CIA) World Factbook (2014), South Africa's coastline stretches for approximately 2.798 km. The country is geo-positioned at a strategic location which influences investment in economic

maritime trade with other international countries. This strategic positioning is justifiable taking into account the maritime shipping route linking the east and the west trading regimes, the hydrography of the area with the three different water masses surrounding the country and the contrasting currents flanking the country. These being the cold nutrient rich and very fish productive Benguela Current to the west and the fast moving warm Agulhas Current to the east.

Commercially, activities taking place within the South African Maritime Zones includes but are not limited to fishing, tourism, shipping, mining, renewable energy, agriculture, and coastal geo-engineering. Exploitation and exploration of these natural resources, space and coastal developments undermines and disturbs the ability of natural cycles to sustain their original form (Collie et al., 2013). South Africa's economy is dependent on maritime infrastructure and space for trading with foreign countries. Economically, about 90 to 95% of South African foreign trades in volume, to the value of approximately $34 billion in 2007 were through the maritime space. Coastal provinces contribute second highest Gross Domestic Product (GDP) after Gauteng, contributing about 38% to the annual GDP, highlighting the importance of the coast to the country's economy. In 2007, about 30% of the country's population lived within the 60 kilometers radius from the coast with approximately 80 people per square kilometer, making it one of the highest coastal population densities in Africa (Turpie & Wilson, 2011).

According to the CIA, in 2013; South Africa was the 42nd exporting country in the world with exported goods to the value of approximately $91.05 Billion. During the same period, the country imported about $99.55 Billion worth of goods; making it the 34th importing country in the world (World Factbook, 2014). Its imports were mainly from China (14.4%), Germany (10.1%), Saudi Arabia (7.7%), US (7.4%), Japan (4.6%) and India (4.5%) whereas it exported to the following countries, China (11.8%), US (8.3%), Japan (6%), Germany (5.7%) and India (4.2%). Most of these goods are carried through the maritime vehicles and transit through one of the major seaports in Cape Town, Durban, Port Elizabeth, Richards Bay and Saldanha Bay. Durban is by far the busiest container port in South Africa with a carrying capacity of approximately 2.712.975 Twenty-foot Equivalent Units (TEU) a year (World Factbook, 2014).

The transportation of these goods impacts on the marine environment and may lead to ocean and coastal space over-use which consequently can escalate degradations of both the living and non-living marine resources. To reverse these, marine protected areas (MPAs) were designed as a tool for combating the ever-increasing exploitation of resources and degradation of ocean space (Agardy *et al.*, 2011). In South Africa, approximately 20 per cent of marine environment is protected (Paterson, 2009). MPAs have in the past helped in biodiversity restoration and decreased the rate natural habitat degradation but over and above that, there are still challenges faced with these tools in place. Topping the list of those challenges is the fragmented institutional and legislative frameworks governing the management, monitoring and welfare of these MPAs.

This is however not a South African challenge, but a global issue as highlighted in Agardy et al., (2011) where MPAs' were evaluated. Another shortcoming from this approach is that MPAs can create imbalances to the habitat as a result of displacement and unintended consequences of management. Another shortfall could be a dysfunctional MPA due to degradation of ecosystems of the larger unprotected surrounding. For these reasons and many others, a broader management tool which not only concentrates to certain kinds of biodiversity and not biased to any kind of biomes but an integration of all maritime activities is needed in South Africa and the world at large. Unlike MPAs which are smaller and designed to cater for a specific ecosystem, Maritime Spatial Planning encompasses and balances the competing sets of all activities within the maritime space.

South Africa is also a well-developed fishing country with highly commercialized industries that have competitive capital intensive approach. Like any other maritime resources, fish faces challenges of being overly exploited if management strategies and measures are not well in place. Failure to manage this resource can prove detrimental to the country's economic development, can lead to environmental degradation within the marine space, and likely to affect communities along the coast which highly rely on fish for food and income for their families. With increasing coastalization (migration towards coastal areas), these resources are facing an ever increasing growth in reliance as food security source (Statistics South Africa, 2012).

In 2009, the fishing industry in South Africa was valued at about R5 billion annually, providing close to 28 000 jobs (FAO, 2010). Internationally, Europe is sitting at poll position in the market analysis with South Africa exporting its fish products to countries such as Spain and France more notably. Japan is also leading in terms of tuna, squid, lobster and abalone exports. Fishing has however been given relatively low primacy as it contributes less than 5% to South Africa's GDP. The demersal fishing sector is the most valuable worth about R1.4 billion annually with Cape Hake species *(Merluccius capensis and Merluccius paraduxus)* being the cornerstone of this class, followed by pelagic fisheries. Abalone, however is the most valuable fishery per unit of harvest (Kashorte, 2003). Greater opportunity is presented however for advanced fishery management in the country, a key to turn-over this deficiency in GDP contribution from these abundant marine resources.

1.2. Maritime Spatial Planning and its genesis

Ehler (2008) in describing the importance and the conception of Maritime Spatial Planning (MSP) quoted Victor Hugo's 1885 famous statement:

"*An invasion of armies can be resisted, but not an idea whose time has come".*

The term "maritime" is used in this study indicating that a broader emphasis of activities undertaken within the ocean's space and in the adjacent coastlines are considered. These activities include shipping (maritime transport), ports, oil and gas exploration, coastal geo-engineering, marine recreation and tourism, fishing, renewable energy farms, and many others. Activities such as these causes pressure on the state of the environment and if not managed in an integrated manner may lead to major impacts and conflicts over marine and coastal space. Pomeroy and Douvere (2008) defined MSP as a tool to improve decision making and to deliver an effective ecosystem based approach in managing human activities in the marine domain. MSP promises to be a new tool to break the inversely related conundrum between social, economic and environmental objectives. Its inception was founded due to the ineffectiveness of other tools to resolve conflicts relating to offshore and other marine environment usage. These tools such as MPAs were designed to simulate single sector management but have been unsuccessful in resolving multiple sectors and integrated management of the ocean (Douvere, 2010).

MSP, defined as a tool for improved decision making, providing a framework for arbitrating between competing human activities and managing their impact on the marine environment rose into prevalence in the late nineteenth to early twentieth centuries (European Commission, 2011). UNESCO-IOC (2007) during its first international workshop in Paris, defined MSP as a process of analyzing and allocating parts of the three dimensional marine spaces to specific uses, to achieve ecological, economic, and social objectives that are usually specified through the political process. It is a regulatory framework characterized through integrating a variety of policies from different sectors with maritime interests. It can also be concisely defined as:

"*An integrated, policy based approach to the regulation, management and protection of the marine environment, including the allocation of space, that addresses the multiple, cumulative and potentially conflicting uses of the sea and thereby facilitates sustainable development", (Maes, 2008).*

Recent global developments and industrialization offsite quantifiable amount demand for ocean use. These lead to new users being introduced into the ocean space adding more pressure into the already conflicted environment. Furthermore, these activities keep increasing with increasing technological advancement due to discoveries of natural resources and capabilities to exploit them. For such rationalities, an integrated tool for the marine resources sustainability reconciling varying economic, social and environmental is needed (Maes, 2008; Gilliland and Laffoley, 2008).

Appropriate management and planning measures are needed to align different spatial scales with dominant and prominent activities taking place within the maritime domain. From past experiences, these spatial zoning for particular maritime interest must be nested with future time/temporal considerations. Maes (2008) put more emphasis on MSP as a tool for developing long-term visions for coastal States to regulate activities under their jurisdiction. Thus, space and time cannot be disintegrated when defining the MSP development process. The purpose is to integrate economic exploitation and social benefits whilst protecting marine environment and intending to guarantee diversification of ocean space for current and future generations.

Historically, Australia's Great Barrier Reef Marine Park (GBRMP) is documented as the first example of MSP designed in 1994 to establish and manage MPAs giving emphasis to multiple-use spatial management. Although it certainly had an ecosystem approach, it is still largely considered as the cornerstone of the management strategy which gave high level of environmental protection to specific areas whilst permitting a locus of human activities including fisheries and tourism (Douvere, 2010; Douvere et al., 2007). This gave a different perspective about MSP as it was initially derived as a tool focusing on achieving nature conservation objectives only. UNCLOS 1982's preamble stating that "the problems of ocean space are closely interrelated and need to be considered as a whole" is seen by many as an idea in which MSP was adopted. Canada, in 1997 adopted an Oceans Act and became one of the pioneers in the world to enact a comprehensive legislature and commitment for the protection and development of ocean and coastal waters (Schafer, 2009). This act gave provisions for the development of the Canadian oceans strategy guiding the management of estuarine, coastal and marine ecosystems which later lead to policies to develop and implement an integrated ocean management plan.

The examples given above are just two from many others around the world, and just like many others do they claim a state of completion as the marine environment is dynamic; new problems and challenges always erupt. Additionally, Schafer (2009) hinted that there's a need for regime change in policies and decision taking for safeguarding the ocean's sustainability. Furthermore, he made assertion and observed that European Union (EU) Maritime Policy emphasized more on integrated sustainable management than nature protection and conservation.

Currently, Schafer (2009) described ocean users as being in a state of "use without coordination". Douvere (2010) postulated that there is a need for a common language amongst MSP practitioners and similarly amongst maritime space users. Furthermore, Douvere (2010) indicated that the current state that can be described through the concept of *"Laissez-faire, laissez-aller"*. This means that the state of oceans is in an economic juncture where transactions between private entities are free from government restrictions and very minimal regulations to protect it. However, various nations around the world are starting to experiment and implement MSP within their ocean governance framework. This is true mostly for European countries where the EU's Green paper on Future Maritime Policy for the Union underlined the importance

of MSP as a key instrument towards management of the ever growing and increasing maritime economy (European Commission, 2011). Germany has enacted a Federal Spatial Planning Act that will see the development of MSP for its EEZ as a compliment to the already developed and applied MSP for its territorial waters along the Baltic Sea. Belgium too developed a Master Plan with multiple objectives MSP that covers their territorial sea and EEZ along the North Sea. This was implemented in 2003 and it's an initiative that arrested conflicts by demarcating zones for sand gravel mining, offshore wind farming and MPAs. Outside the EU region, MSP initiatives are developing and starting to gain momentum particularly in Canada, China, Australia and are starting to shape up at a slower pace in the United States and other parts of the world (European Commission, 2011).

1.3. The process of Maritime Spatial Planning Development

Ehler (2011) indicated that MSP is not a once-off or one-time plan. However, it is a continuing and repetitious process that adapts over time. Such process is comprised of plan-making, plan implementations, and monitoring and evaluation of plan performance as its pillars. These embedded processes are important for evaluating baseline knowledge, necessary for enabling investments, stakeholders engagement, proposed changes and ongoing activities, and to assess effectiveness of these plans, their time scales together with reviewing of adaptation procedures.

Planning is the backbone of any governance initiative and it's a very important phase where a process of who gets what, when, and where, how, at what costs, and who pays the costs is analyzed. Because MSP is a continuous process, the planning phase must cater for needs to generate information at various points (UNESCO-IOC, 2007). The general framework of the planning process is illustrated in the figure below.

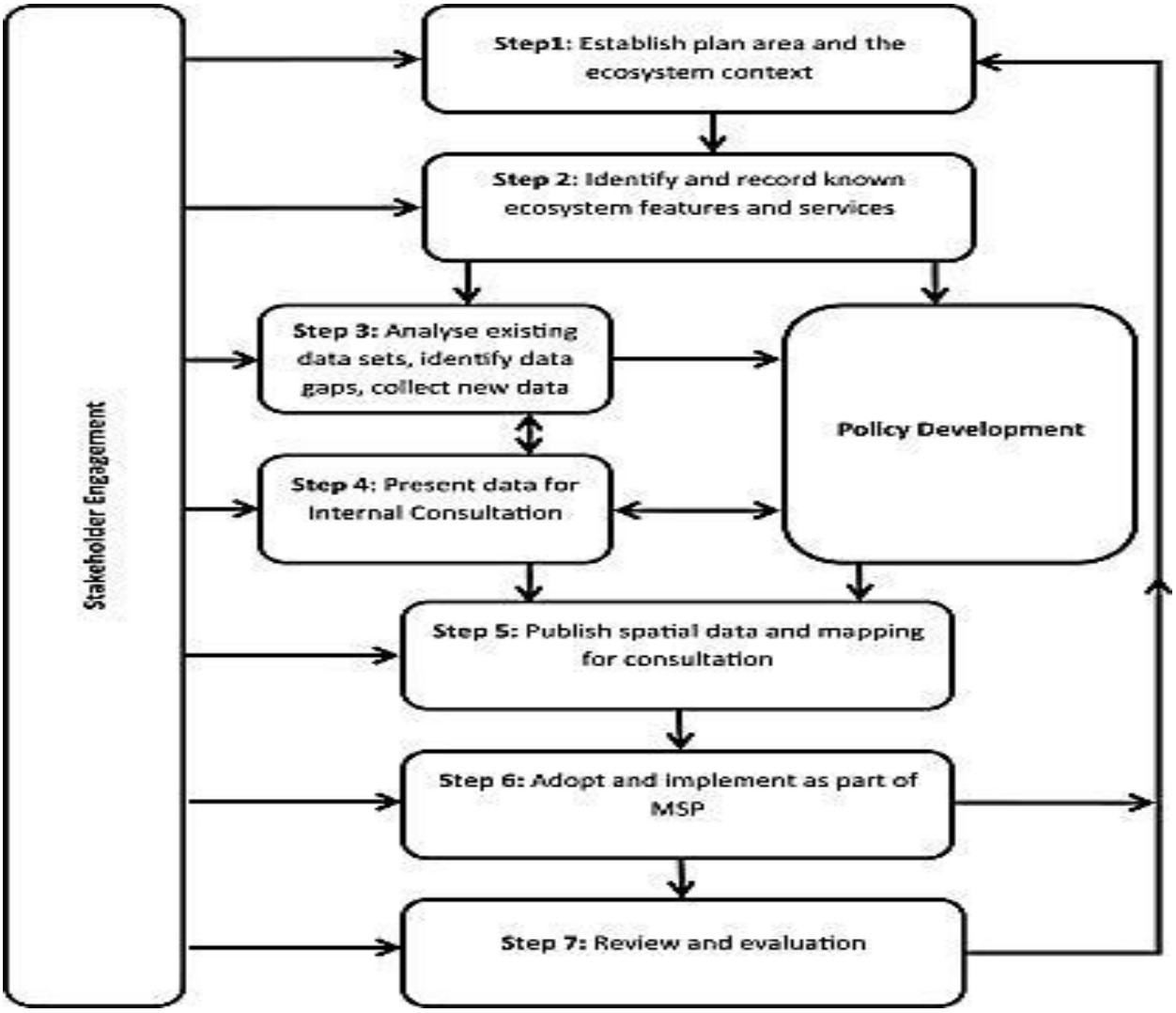

Figure 1: The elements of Management and Planning showing stakeholders as the cornerstone of MSP development plan (Shucksmith et al., 2014)

Ehler and Douvere (2009) in "*Marine Spatial Planning: a step-by-step approach toward ecosystem-based management"* documented that MSP planning involves a 10 steps quasi-linear process. These processes form part of the initiative which attempt to provide answers to the questions below:

a) Where are we today – Evaluation of the baseline conditions?

b) Where do we want to be – Initiatives to inspire alternative scenarios and desired visions?
c) How do we get there – Spatial management mechanisms to propel us toward the desired future?

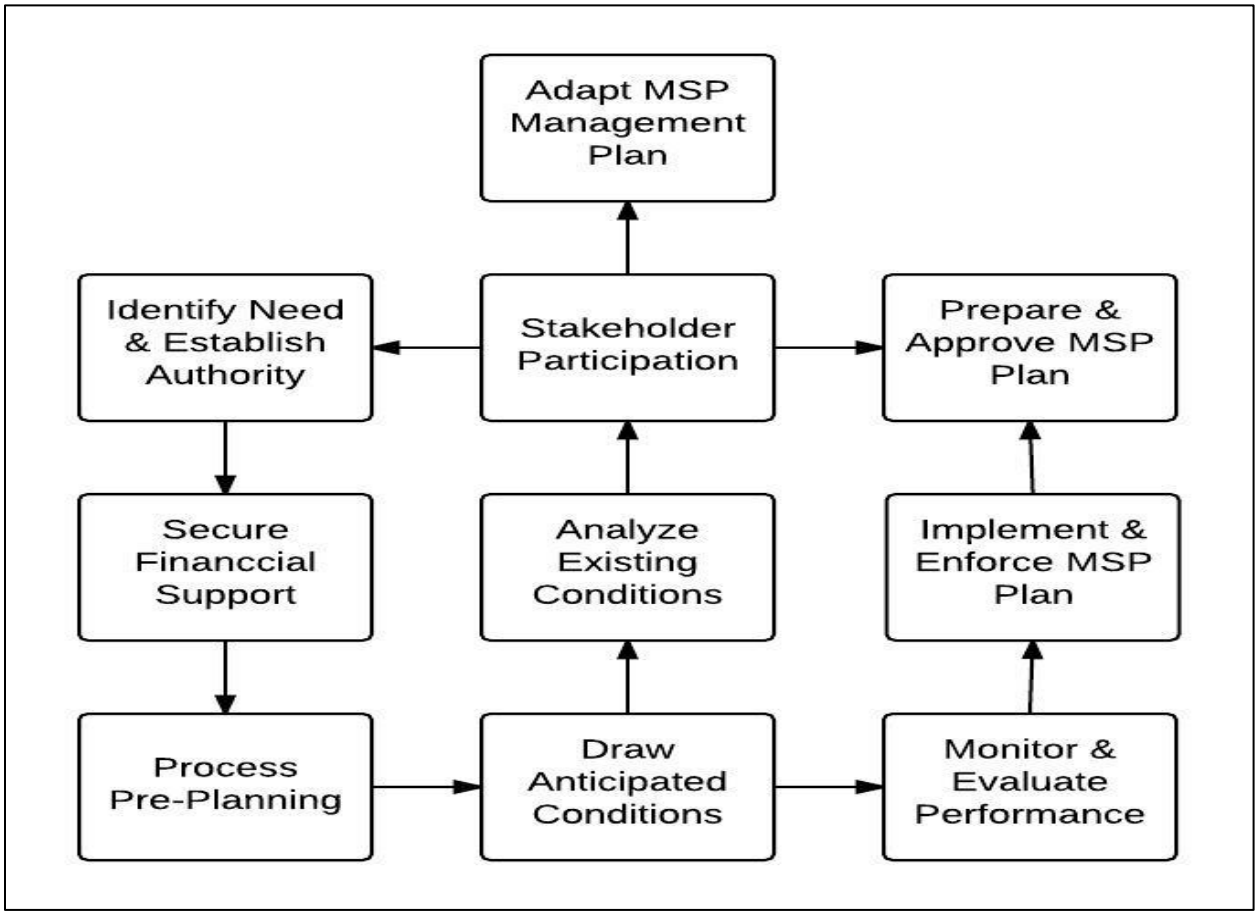

Figure 2: The development and implementation of the MSP process. Source: Author based on Ehler and Douvere (2009).

Involvement of stakeholders however is very important as it provides opportunities to deepen mutual understanding and to integrate solution finding mechanisms. It also increase stability and provides platforms for capacity expansion whilst increasing mutual consent as a point of departure in resolving conflicts (Pomeroy and Douvere, 2008). Furthermore, Ehler and Douvere (2009) went on to breakdown the process as follows:

a) Pre-Planning Process - Forming a team and developing a Work Plan, Defining principles, goals and objectives; and Specifying boundaries and time frames.

b) Analyzing Existing Conditions – Mapping important biological ecological areas, Identifying spatial conflicts compatibilities, and Mapping existing areas of human activities.
c) Drawing Future Anticipated Conditions – Mapping future demands for ocean space, Identifying alternative spatial scenarios, and selecting a preferred spatial scenario.
d) Preparing and Approving MSP management plan – Identifying alternative spatial management, Developing and Evaluating the spatial management plan; and approving the spatial plan.

Ehler (2008) however challenged and warned MSP practitioners against developing policy plans that are too open leaving room for diverse interpretation about their goals and applicability. Furthermore, he iterated that there need to be more consistencies when defining terminologies and the MSP concept. This is crucial during the MSP development phase, as diversion may cause dilution and weak policies leading to poor decision making at a national level. Some inconsistencies led to usage of terms such as spatial management, ocean zoning and integrated management plan being interchangeably used with MSP.

Another important aspect to consider during this initial phase is to eliminate uncertainty. There are limited resources in terms of predicting the ecosystem behavior and these calls for very robust processes to integrate all the knowledge bases from different stakeholders. MSP process must also be adaptive because of the dynamism of the maritime environment. These coupled with inconsistencies and unpredictability of human element within the maritime domain requires MSP to have time dependency as one of the variables. With the advancing technology to discover living and non-living marine resources in the ocean, even in years to come, the temporal element of the plan must not be divorced from the broad MSP development plan. Importantly, Ehler (2008) indicated that a regime change is needed relevant to MSP with less focus on ecosystems as they have thresholds and limits which once exceeded; changes are mostly irreversible leading to major system restructuring.

Ehler (2008) made some recommendations for standard global acceptable MSP development process to satisfy the following activities:

a) Create networks with international advisors to help develop the MSP guidelines and principles.
b) Study lessons learned from other international case studies of good practices on maritime spatial management.
c) Evaluate, clarify and adapt to the general principles and guidelines at an international level.

Chapter 2

Research Objectives and Methodology

In this chapter, the rationale for the study is discussed together with methodology implemented for data collection. Research objectives are specified with specific attention given to descriptive analysis of where South Africa is currently in terms of Maritime Spatial Planning development with respect to legislative, economic, social and environmental agendas.

2.1. Research Objectives

In attempting to satisfy the objectives below, indicators as to where South Africa is currently in terms of environmental laws or acts, economically, and socially with respect to Maritime Spatial Planning development will be evaluated. These will serve as baseline conditions to inspire alternative initiatives and frameworks for desired visions of the country. Consequent frameworks will then be utilized as tools to drive the future of maritime domain's outlook in South Africa and be aligned with the National Development Plan (NDP) 2030 visions.

The following are the objectives of this study:

a) To describe the rapidly developing concept of Maritime Spatial Planning and discuss its applicability to the situation in South Africa.

b) To analyze current policy and governing frameworks against the development of Maritime Spatial Planning in South Africa, potential national recourses available towards its realization and the benefits to the country from its implementation.
c) To evaluate the importance of Maritime Spatial Planning development in South Africa as a medium for economic development and sustainable growth of the maritime sector in the country.

2.2. Research Methodology

Maritime Spatial Planning is a relatively new concept for multi-sectoral governance and management of maritime activities. Its development is mainly to serve in analyzing and allocating areas of the maritime space to different users for economic and social use while ensuring that sufficient areas are protected for the future. It then calls for an integrated participation from all stakeholders involved. In this study, a qualitative approach towards achieving the objectives is utilized. Case studies are also studied to ascertain processes applied and challenges faced together with benefits and opportunities for future growth in developing MSP.

Insights are drawn from these case studies and comparative analysis will be conducted in order to identify similarities with respect to criteria followed and guiding principles used in developing MSP. Analysis of these case studies will unpack reasons for MSP development in Germany (North Sea), China (Marine Functional Zoning) and the United States (Rhode Island's Special Area Management). Although, currently there is no blueprint in South Africa with respect to Maritime Spatial Planning; key initiatives, regulatory frameworks, and (potential) conflicting activities necessary for its development will be examined against those from other countries (case studies).

In deriving baseline information about state of affairs on where the country is in terms of MSP development in South Africa, a survey was conducted (see Appendix A, B and C). This survey was in the form of an online questionnaire directed to maritime industry practitioners in South Africa at all levels from students, junior staff to senior managers. Government agencies and

departments, private companies, research institutions, institutions of higher education learning, coastal municipalities, and general public were represented in the survey respondents (20 in total). It is important to indicate that the survey was designed to allow anonymity of the participants or respondents for ease of expression. A variety of questions (25 in total) were asked as we attempt to develop baseline information and assess whether MSP development is South Africa is viewed as a priority.

The questionnaire tries to get insights regarding how MSP will help develop the maritime sector's sustainable development and whether it is compatible with economic development goals of the country. With the help of the survey, current and envisaged future stakeholders and associated activities were identified. Questions on which activities are viewed to be competing for maritime space use formed part of the survey. The role government and which department need to play in the MSP development is also defined whether to facilitate or lead in driving this innovation. Most importantly, the survey also sought expected outputs or benefits to be incurred with the development and implantation of MSP in South Africa. However, in realizing these; technical skills, political will, economic capital and legislative frameworks to support development of MSP are required and the survey also sought to establish if these requirements are sufficient in South Africa in comparison with other countries having developed MSP.

Chapter 3

Applicability of Maritime Spatial Planning, the South African legal perspective

3.1. Background on International Legal Regime on Maritime Spatial Planning

Maritime Spatial Planning has recently emerged as the *"crème de la crème"* of ocean zoning by means of making it possible for sea-use and ecosystem based management balance whilst maintaining the integrity of the environment for sustainable future use. Historically, environmental planning initiatives were focused mainly on Marine Protected Areas (MPA). Examples of which are the Great Barrier Reef in Australia and the United States' Florida Keys which spans back to 1975 and 1981 respectively. South Africa, on the other hand has been endowed in this practice since 1964 with the proclamation of the Tsitsikamma MPA. This MPA is Africa's largest and oldest "no-take" with coastal prolongation of about 57 Km and total surface area of about 32 300 hectares (WWF, 2009).

Internationally, UNCLOS recognizes the need for integration when dealing with issues related to ocean space. Resultant from this, Chapter 17 of the Rio Declaration's Agenda 21 obliges coastal States' commitments towards integrated management and sustainable development of maritime environment within their domestic jurisdiction (United Nations, 1992). Under international laws, there are virtually few or no constraints undermining the development of MSP within the coastal State's maritime domain (internal waters and territorial seas); with the high seas as an exception.

MSP implementation must however as provided by UNCLOS not hamper freedom of innocent passage to foreign vessels in distress. The continental shelf is fully regulated and managed by the coastal State with respect to its living and non-living natural resources over the seabed (European Commission, 2009).

Biodiversity within the maritime space is continuing to deteriorate with increasing human activities. This lead to limited resources availability both in time and space, and increases conflicts amongst different users. It then calls for improved governing frameworks and ecosystem based management approaches which integrate different sectors for the protection, preservation and conservation of the environment. A look at the South African legislature with respect to maritime activities and biodiversity will be discussed in the next section.

3.2. South African Legal Frameworks governing the Maritime Environment

The South African constitution gives provisions for a maritime environment that is properly governed and managed not to detriment the good and services it provide for current and future users. It summons for an environment that promotes both ecosystem and economic sustainability. However, seemingly an imbalance between the two sectors (ecosystem management and economic growth) within the maritime industry or practice exists. Although about 90% of global trade in volume is transported through maritime space, with South Africa's foreign trading to the region of about 95% through this medium; this imbalance still persists. These imbalances are in terms of financial investment, awareness, skills development, policy development and governance (Republic of South Africa, 1996).

In South Africa, like in many parts of the world, a bias exists towards ecological well-being of the maritime space, neglecting other services this medium provides towards economic and social sustainability of the country. The European countries have up to until recently started to prioritize maritime governance towards promoting economic development, however maintaining the integrity of the environment. Taljaard & van Niekerk (2013) indicated that the South African Constitution (Republic of South Africa, 1996) specifically requires sustainable ecological development balanced with the promotion of justifiable and reasonable legislature instituting for

social and economic initiatives. Apart from The Constitution, the National Environmental Management Act (NEMA) accordingly is another ecosystem based management legislative tool with the three bottom line (social, environment and economy) approach towards sustainability (Republic of South Africa, 1998a). However, its interpretation and implementation disintegrates these core components and focuses mostly on environmental matters. According to Taljaard and van Niekerk (2013), NEMA is a soft non-executing legislative tool which pleads with interested parties to apply the act on matters affecting the above mentioned bottom lines; although biased towards the environment. Glazewski (1999) however indicated that environmental protection, economic development and social enrichment are the cornerstone of sustainable development.

The Act (NEMA) invokes national departments, provinces and local governments responsible for implementing and monitoring environmental functions to customize plans that will be reviewed regularly. These plans may be integrated with the national framework or be enacted at a small scale or regional scale based on the need and adaptive requirements of each locality. NEMA forms the basis of South African's environmental centerpiece. It provides the basis for many other legislative tools such as the Integrated Coastal Management (ICM) Act, Biodiversity Act, Protected Areas Act, Air Quality Act, National Water Act, and many others. NEMA also give provisions for co-operative governance through its many arrays where statutory mechanisms are set based on management principles, planning frameworks and conflict resolution procedures. Paterson and Kotze (2009) mentioned that notwithstanding these arrangements, cooperative governance can be achieved if there is a propellant political will. Economic development must form the focal point and backbone of all these mechanisms.

3.2.1. The Integrated Coastal Management Act

The ICM Act gives provision for the establishment of an integrated coastal and estuarine management system promoting conservation of coastal environment and resources through developed norms, standards and policies (Republic of South Africa, 2009). It however does not promote economic development through usage of natural coastal resources. ICM only pledges for sustainable ecological and social justice (Celliers et al., 2009). It has Maritime Spatial Planning elements as it restricts usage of sensitive coastal areas for specified purposes or

activities whereas on the converse allowing other activities to take place along less sensitive areas of the coast. Integration of coastal management at provincial and municipal level are incorporated to fit with the existing land-use and demarcation schemes, indicating another element of spatial zoning within the ICM Act. Taljaard and van Niekerk (2013) explicitly postulated that ICM Act fits the bill most as a statutory tool for advancing MSP development in South Africa. It emerges from Celliers et al., (2009) that ICM Act is mandated to raise public awareness on the complexities surrounding coastal zone management and processes that influences its behavior.

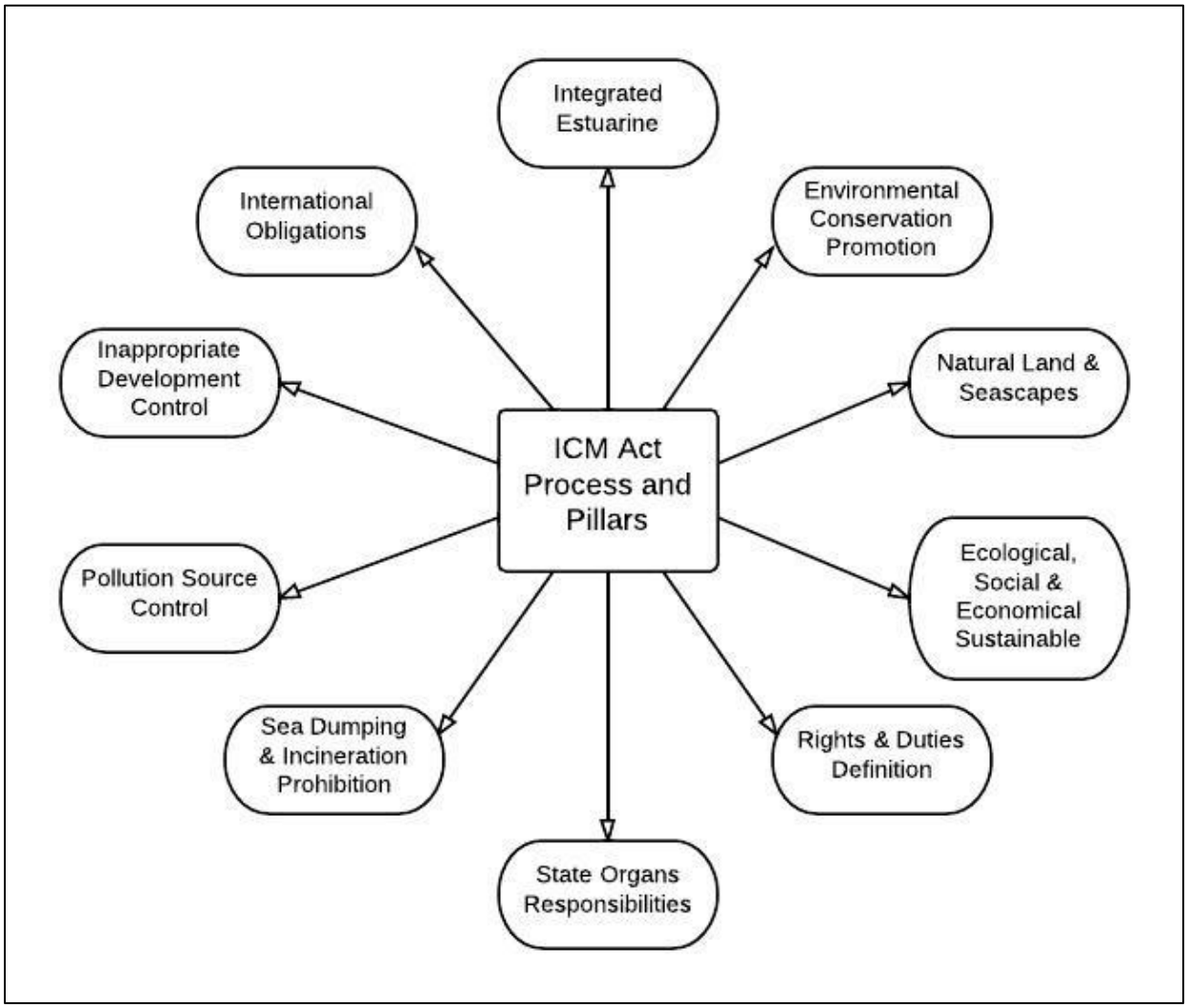

Figure 3: Integrated Coastal Management Act processes and pillars. Source: Author based on Celliers et al., (2009).

3.2.2. The Biodiversity Act

It is a law which proclaims the State's custodianship to biological diversity. This act summons the State to protect, promote, respect and fulfill its constitutional rights as provided for by the NEMA (Taljaard & van Niekerk, 2013). The signing into power of this act saw the establishment of the South African National Biodiversity Institute (SANBI) in 2004. Biodiversity Act promotes equitable and sustainable use of indigenous biological resources and sharing the proceeds emanating from their bio prospecting process (Republic of South Africa, 2004).

Biodiversity Act mainly addresses issues on adaptive management, effective cooperative governance, ecosystem based management, and objective based management. These can be illustrated by the following components of the act as listed in (Taljaard & van Niekerk, 2013):

a) Indigenous use of biological resources sustainably.
b) Equal sharing of resources amongst stakeholders.
c) Initializing norms and standards towards improved management and conservation of biodiversity.
d) Integration, coordination and uniform approach by State organs, non-governmental organizations, private sectors, local communities and the public in general.
e) Regular reviews of compliance indicators measures.

The Biodiversity Act unlike the ICM Act put more emphases on the cooperative governance towards biodiversity protection, whilst the latter leans more on coastal zoning and planning. Divergent to Taljaard and van Niekerk (2013) conclusion citing the Biodiversity Act as one of the legislative tool and key prototype underpinning MSP, it is however seen here as a non MSP or zoning framework but provides for elements necessary for governance responsibilities.

3.2.3. The Maritime Zones Act

UNESCO-IOC (2010) defined MSP as a "process for public authorities of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives". South Africa has also ratified the UNCLOS (United

Nations, 1982) giving provisions to a variety of terms and scope in accordance to the General Acceptable International Rules and Standards (GAIRS). Consequential to this, a Maritime Zones Act was adopted in 1994. It aims to provide and delineate maritime zones of the republic (South Africa) and accentuate activities connected thereto with those specified zones (Republic of South Africa, 1994).

The Act is believed to be fundamental for MSP development as it captures by means of definitions contemplated activities likely to take place within the internal waters, territorial waters. Maritime Zones Act also calls for cooperative governance as it gives provision for installations of pipelines, exploration and or exploitation of resources, research activities, shipping and transportation, military activities, maritime casualties, and fishing zones. Thus, different maritime space users and stakeholders involved in these activities are expected to participate towards the development of MSP in the country (Republic of South Africa, 1994).

3.2.4. The White Paper on National Environmental Management of the Ocean

Glazewski (2013) in his commentary on the National Environmental Management of the Ocean (NEMO) in its Green Paper stage acknowledged its significance and welcomed its development, however long overdue. Further to that and more importantly, Glazewski (2013) proposed that for the purpose of inclusiveness; the term "governance" should have been used as opposed to "management". This would allow the full spectrum of ocean or maritime space users to participate in driving the process towards the common set goals, and will negate the notion in its "implied" interpretation that the Department of Environmental Affairs (DEA) is monopolizing the whole process as the driver of the initiative.

Notwithstanding Glazewski (2013)'s assertion, NEMO was gazetted as a White Paper in May 2014. It is rooted and based on the four strategic themes being Ocean Environmental Information; Ocean Environmental Knowledge for Sustainable Development; Ocean Environmental Management; and Ocean Environmental Integrity. NEMO White Paper although addressing these key environmental issues still lacking in the country; it seldom make mention of the importance of MSP development initiative as a keystone and priority of the intended ocean

management framework. NEMO White Paper is also structured as a Strategic Plan document highlighting mid to long term objectives and set activities towards their realization. It is indicated in the White Paper that it contends South Africa to make a transition from current distinctive or soloistic sector based approach into a more holistic coordinated cross sectoral management. The importance of economic development ensuring growth and stability of the country through improved management and cooperative engagements is shadowed by many arbitrary aspects of the document and should have been elevated to one of the theme as opposed to just a guiding principle (Republic of South Africa, 2014).

Glazewski (2013) also raised critical questions in that NEMO although welcomed is not precise on its objective as to whether it aims to be adopted as strategic document, or to improve cooperative governance within the maritime sphere, or to be used as a new ocean governance act or policy or both. There is also a silent noise within NEMO on mechanisms to be implemented in achieving the objectives as highlighted in the four themes above. DEA as the custodian body may need to engage other bodies with adequate tools to implement compliance and enforcement measures, important for regulating maritime activities. NEMO also prove to undermine the importance of South Africa's maritime space in enabling regional (Southern African Development Community and African Union) and international trade through the ports and the shipping routes linking the east and west trading paths.

3.2.5. African Union Integrated Maritime Strategy

The African Union (AU) after the realization that about 90% of African trade with international players is through the maritime space, complementing the fact that thirty-eight (38) countries are coastal or island States; it developed a strategy document which aims at changing the shape and economic outlook of the continent. Whereas the maritime space is under pressure, activities in this domain such as shipping, fisheries, oil and gas exploration, and many others are intensifying (African Union, 2012). These activities are however happening in contrast to the backdrop of insecurities, illegal trafficking, maritime environment degradation, biodiversity demise and climate change. It then calls for Africa through the AU's Africa Maritime Domain (AMD) to act

inclusively and derive measures to regulate and manage these issues and overturn these challenges into opportunities to realize the true economic growth potential the seas provide.

MSP is one of the activities annexed in the strategy document as a key element of the strategic framework actions. AU defined MSP as "a comprehensive, adaptive, integrated, coherent, ecosystem-based, and transparent spatial planning process based on sound science" (African Union, 2012). This activity will provide basis for policy processes rooted on characterization balancing the frequently competing sectors with overall outputs which allows for; efficient and sustainable utilization of maritime space, evidence based policies and decision tools, and greater legal certainties which encourage investor to invest in the intended African blue economy. These initiatives are in line with Maes (2008) and Ehler (2008)'s assertions that MSP development relies on sectoral planning, political will from politicians, and strong national policies.

Chapter 4

The Battlefield Concept: The Demand and Supply Analysis of the Oceans

4.1. The Nexus between Social, Environment and Economic Growth within the Maritime Domain

Quoting Von Bormann and Gulati (2014), "South Africa's economy is testing the limits of its resource constraints". However, this has proved to be a global contagion facing economists as witnessed by many emerging policies development being aimed at building a firm sustainable economy. Camagni et al., (1998) asserted that exponential population growth is impacting and undermining both the environment and the agglomerating economies. From this, interconnectedness between social, environment and economy is established and their wellbeing can be used as a key indicator for a healthy and sustainable policy regimes. It is imperative for South Africa to develop mechanisms to manage and govern these pillars separately and collectively as they behave differently within a locality they co-exist within.

Notwithstanding these spill-over characteristics, they also have positive and negative externalities impacting growth and development of the country. Eco-innovative strategy is recommended to be a solution from this cobweb. It involves the three pillars of sustainability and other enabling mechanisms such as Technology and Performance Management. These pillars are best illustrated in Camagni et al., (1998) where sustainability was defined as "a process of

change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional changes are made consistent with future as well as present needs".

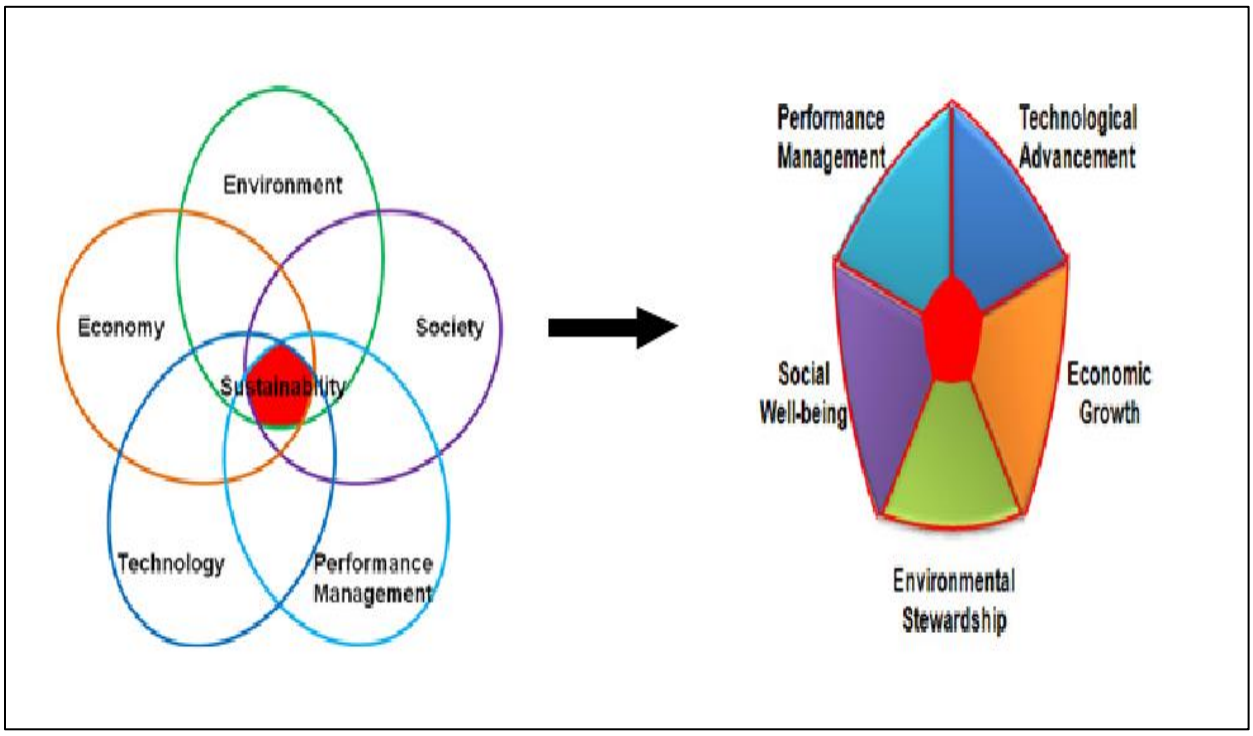

Figure 4: Simplified sustainability strategy showing transition from complex but transparent process into clear and precise equally importance of each pillar.

According to (OECD, 2013), South Africa is ranked in the top seventeen (17) in terms of world's richest biodiversity, but runs one of the most carbon and energy intensive economy. Environmentally, the report indicates that pressures are adverse in most populated regions. These pressures have spill-over effect as they negatively affect ecosystems around and as a result, most of the endemic species are endangered.

4.2. The Economic and Social Context as catalysts/drivers for MSP development

South Africa has until recently (May 2014) lead the African economy and has grown its economy since the last decade at a faster rate relative to most OECD countries. This is entranced by its high reliance in mining and mineral activities with very minimal maritime economic abilities. These beside the fact that mining and minerals sectors' contribution to the GDP has faced a landslide fall from 21% in 1970 to 6% by 2011 but still represents 60% of the overall export products. Its GDP contributions grew on an annual average of 4.2% between 2000 and 2008; however it slumped by an average 1.5% in 2009 at the face of the global recession as shown in the figure below (OECD, 2013).

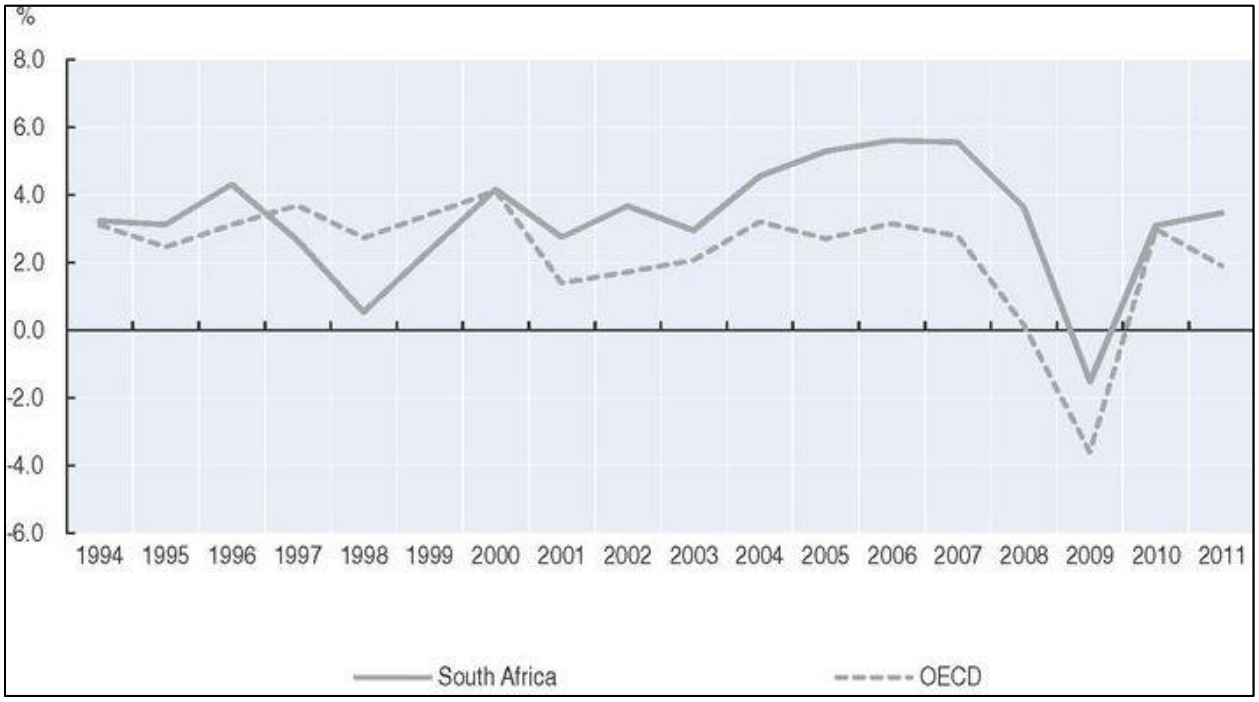

Figure 5: Indication of actual GDP growth rates between the OECD and South Africa for the period 1994 to 2011. Source: OECD (2014).

As indicated in the figures 5 and 6, South Africa's economy improved by 3.1% in 2010, 3.5% in 2011 and by 2.5% in 2012. Important to mention is that exports of up to 27.3% and imports of 27.5%, 90% of which is through the maritime space (World Factbook, 2014) accounted for the

overall GDP. In terms of fishery resources, the west coast is highly productive with less variety in biodiversity compared to the less productive but temperate and rich in biodiversity east coast. The fishing industry contributes up to 0.5% of the overall South African GDP and 0.6% of catches globally. Between 2000 and 2005, fish catches are reported to have grown by 27% however dropped between 2005 and 2009 as the responsible bodies implemented stricter fishing measures (quotas) to fight the highly prevailing Illegal Unreported and Unregulated (IUU) activities in the region (OECD, 2013).

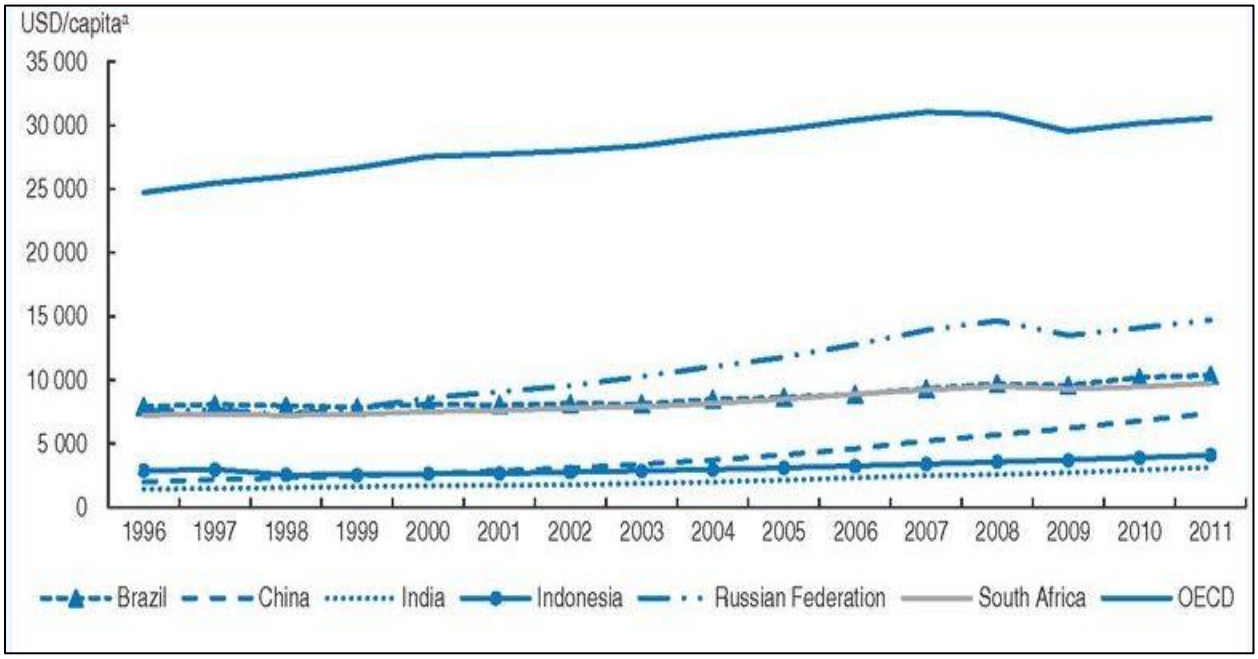

Figure 6: South Africa and other emerging economies per capita GDP between 1996 and 2011. Source: OECD (2014).

Socially, South African maritime space which is equivalent to an area of 4.34 million km^2 bears the burden of providing for approximately 53 million (52 982 000) of its population. About 43.6% of which have implied direct dependency on the maritime environment as they live in four of the coastal provinces (Eastern Cape = 12.5%, KwaZulu-Natal = 19.7%, Western Cape = 11.4% and Northern Cape = 2.2%) as indicated in Figure 7 below (Statistics South Africa, 2013b).

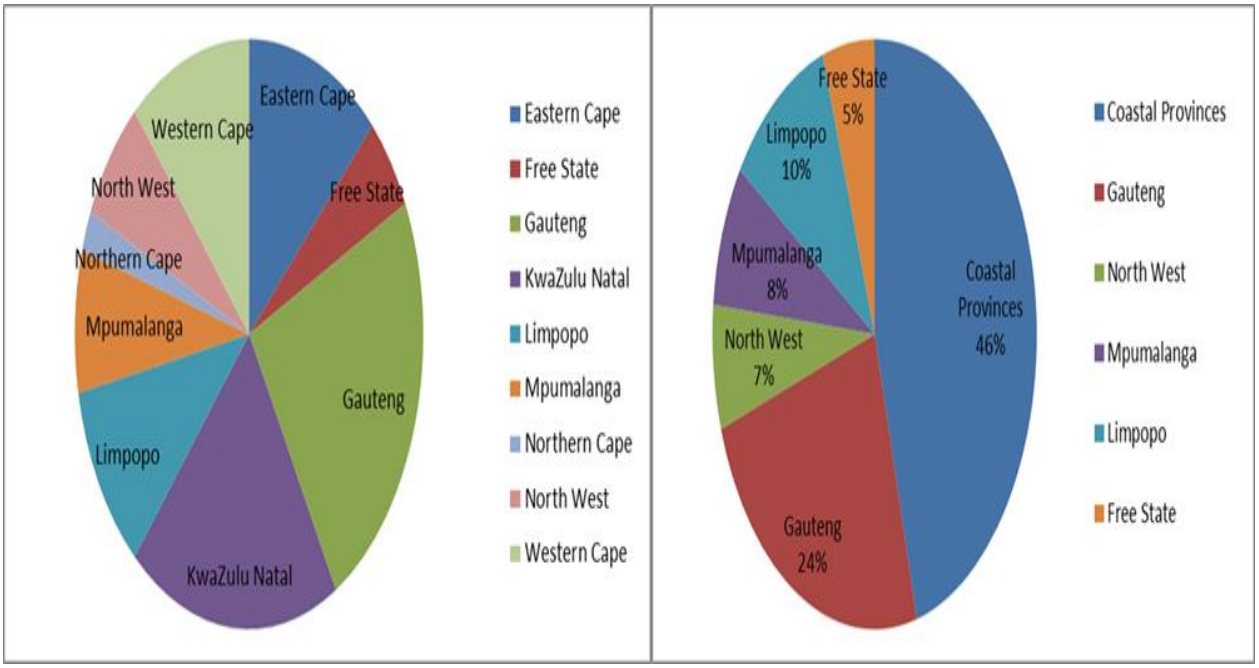

Figure 7: Population distribution per province in South Africa, highlighting the importance of coastal areas as the most habitable. Source: Data from Statistics South Africa, (2013).

South Africa's economy is however failing to support its population as extracted from the high unemployment rate since the early 2000s. OECD index for economic indicator derived from unemployment rate is 8% but South Africa tripled that index as it ranged between 26.6% and 21% in the corresponding years, 2002 to 2007. The youths are the most disadvantaged with 49.8% of them unemployed in comparison with OECD buffer of 16.2%, leading to about 54% of South Africans on less than United States (US) $2 a day (OECD, 2013).

4.3. National Development Plan Vision for South African Economic Growth

In its mission to abate poverty in the country, South Africa through the National Planning Commission developed a vision with targets set at 2030 called the National Development Plan (NDP). Quoting from the National Planning Commission (2011),

"No political democracy can survive and flourish if the mass of our people remain in poverty, without land, without tangible prospects for a better life. Attacking poverty and deprivation must therefore be the first priority of a democratic government".

Thus the National Development Plan (NDP) tries to solve problems illustrated in the previous section, by intending to create a strong and adaptive economy to sustain the country's population and be adaptable for future needs. One of the mechanisms is balancing the three pillars of sustainability (social, economy and environment). For the environment to be sustainable, management efforts must be put in place and be engraved within the legislative frameworks to enable enforcement and monitoring to manifest smoothly. It is believed that a healthy maritime environment potentially can influence the effectiveness and efficiency of production ecologically, socially and eventually unleashing potential economic growth. Conversely, a healthy economy is also viewed as fertile soil that a healthy environment and social cohesion endures to spring off. Thus a balancing act is needed for this three-way relation to be sustainable.

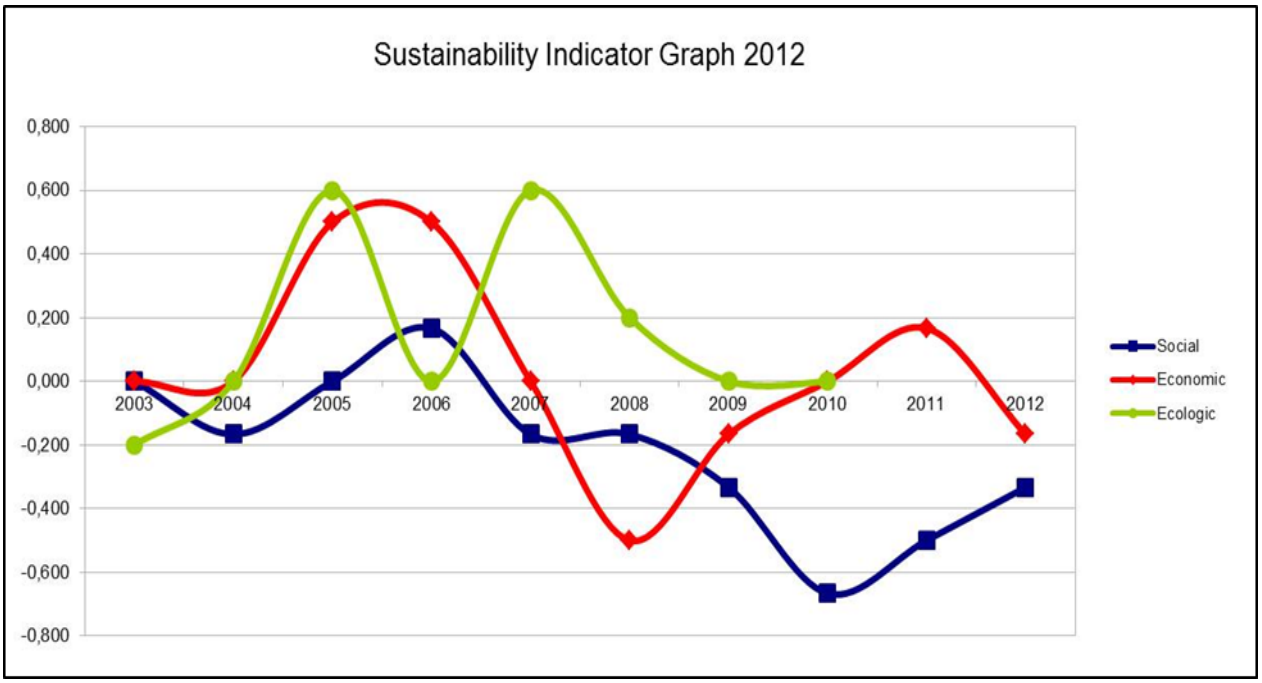

Figure 8: The reciprocity relation between the three pillars of sustainability. Source: Wadden Sea Forum Secretariat, (2014).

Currently, in many sustainability indicator indices where the tree bottom lines are utilized; the existence of a reciprocal but non-linear relation between the three especially social and economic variables is apparent. Seen above (Fig 8) are the results of the study conducted by the Wadden Sea Secretariat Forum between 2003 and 2010 (Wadden Sea Forum Secretariat, 2014) and the love-hate relation between components of sustainability are observed. South Africa too is not

immune from this according to the NDP due to her unsustainably resource intensive policy. It is then recommended and documented in the NDP framework that mechanisms building towards an inclusive economy with more dynamism should be implemented. The basis of these mechanisms should be rooted in investments towards skills development, especially in the highly unemployed youths in the country (National Planning Commission, 2011).

The NDP 2030 vision also encompasses initiatives likely to improve the country's maritime scope towards economic growth. Envisioned in these are plans to build a new dug-out port in Durban to increase the capacity and efficiency of cargo handling at the busiest port in South Africa. It also look at plans to construct new infrastructure entailing importing liquefied natural gas and to increase exploration means to sustain or to be able to feed the South African domestic petroleum grid.

4.4. A Paradox of Plenty or Risk for Conflicts Generation?

Climate variability has proved to exacerbate challenges facing the country's water, energy and food security. Analogous to this, questions are raised whether the resources are shrinking or is social dynamics affecting them. Von Bormann and Gulati (2014) estimated that over 20% of South Africa's population is vulnerable and affected by food insecurities with 60% of overall households spending about 80% of their earning on food. Furthermore, about 9% households do without access to clean water (a more conservative estimate, provided South Africa is a water scarce country).

South Africa however is rich with natural living and non-living resources both within the maritime space and in the hinterland. This put the country in a paradoxical state of affairs which is twofold. Firstly, with its maritime territory together with associated resources; does South Africa have the ability to explore full benefits from such sacred potentials? Lastly, this paradox is seen with the number of stakeholders and interested role players within the maritime space; does this help in fast tracking solutions or is a risk for conflicts?

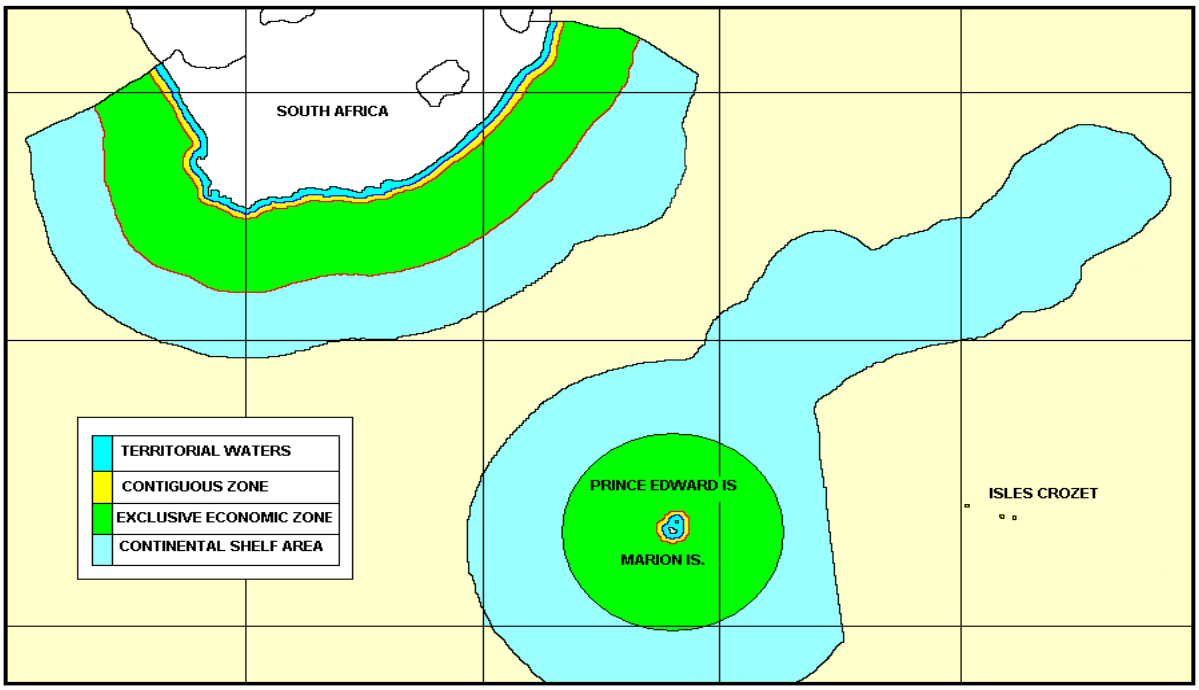

Figure 9: Map indicating the South African maritime territory. Source: Global Security, (2013).

Basically, any maritime space use which (potentially) disrupts another use or management plan can be categorized as conflict. This includes but not limited to planning or installations of wind farms in major fisheries area, setting up offshore oil and gas exploration sites along shipping routes/lanes, allowing eco-tourism activities within MPA areas and many others. They all create conflict with each other and intensify organizational or management conflict, which calls for development of MSP to harmonize and minimize these conflicts between maritime users and use. MSP is then seen here as a tool to best minimize maritime user and use conflict leading to cooperative and collaborative efforts towards protection of sensitive areas. These can be achieved through good governance and experience within the maritime domain.

According to Statistics South Africa (2011), the number of people with formal tertiary education in the country has been increasing. Between 1996 and 2011, Gauteng had a higher rate of 18.1% followed by Western Cape (14.4%) and an overall (national) 11.3% of population having tertiary training education. Clearly, there is a major shortage of skilled practitioners in the science related disciplines in general, not to mention in the maritime domain. Comparing this statistics and the 1 066 655 km^2 of EEZ to be managed and monitored, as a country South Africa might be shooting

itself on the foot, especially without development of tools like MSP and enforcing policies towards improving the state of education. Management of 21 MPAs with more than 11 000 recorded marine species, 31% of them being endemic puts a lot of pressure on the few work force entrusted with such responsibilities (WWF, 2009). Declining fishing stocks, climate change, sea-level rise, eutrophication, coastal erosion, storm surges, marine pollution, maritime transport, port management, offshore mining (renewable and hydrocarbons energy), and many others are but some of the activities facing this diminished pool of practitioners in South Africa. A deficit in terms of skills development and investment in education is apparent. A shift in policy development is not a far-cry if the country intends to have policies to compete with other developing countries.

Within this paradox where skilled technocrats in the maritime domain are few, lies another paradox embezzled in networks of organizations with authority in their own rights to practice, exploit and explore resources within the maritime domain. This may create some jittery amongst the maritime space users and has potential to create conflicts and paralyzes cooperation towards achieving sustainability. Glazewski (2013) indicated that, although the Department of Environmental Affairs have custodial role in driving matters related to maritime space use for social and economic benefits whilst maintaining the integrity of the environment; they turn to have a scant view on other activities beyond their "business as usual approaches" responsibilities. These activities forms core business functions of other governmental departments such as Agriculture, Forestry and Fisheries (marine fisheries); Arts and Culture (historical wrecks); Communications (subsea cables); Defense (navy); Energy (oil and gas, renewable energy); International Relations (climate change negotiations and international trade); Science and Technology (scientific research); Transport (ports, maritime transport and shipping, pollution from shipping); together with the coastal provinces and coastal municipalities.

Additionally, governmental agencies and non-governmental organizations (NGO) such as Wildlife and Environment Society of South Africa; South African Institute of Foreign Affairs; Worldwide Fund for Nature; and many others notwithstanding parastatal organizations like Eskom, PetroSA, SAMSA, SAWS, Telkom, TNPA and CSIR have invested interest in the maritime environment. With the shortage of skills, questions arise as to whether these

organizations are producing their intended outputs, and if so; how long will it take before the whole system collapse before measures are put in place to negate this shortcoming. Cases like this lead to most managers being involved in quick and easy projects; portraying shortsighted views as they focus on just a subset of the bigger problem. A recipe for user conflicts and catalyst for increased stress on the maritime environment and its administration systems (Ehler, 2013).

It is then imperative for any government facing similar dilemmas, to revisit their policy frameworks. Maritime space enables South Africa to trade internationally with about 90% of products in volume being transported through seaborne means. Therefore, maritime environment is a pillar of economic development and policies promoting protection, preservation and sustainable utilization of resources are needed for the stability and growth of the country.

Chapter 5

Economic Benefits from Developing and using Maritime Spatial Planning in South Africa, “fact or farce”?

5.1. The Economic Significance of Maritime Spatial Planning

Globally, management of maritime space or environment have mainly focused on fisheries as to how much the total allowable catch (TAC) should be without depleting the population and the ecosystem. However; this has been changing since the inception of MSP and ocean zoning (Ehler, 2013). Additionally, this management approach proved to have neglected changes in the ecosystem behavior over time. South Africa followed the same trajectory until recently when talks on Climate Change dominated the international agenda. Until then maritime environment was all but fisheries management neglecting other sacred resources and use that may be beneficial to the growth of the country.

Maritime industries or sectors are substantially significant to economic growth as they contribute towards tourism and recreation, seaborne trade, maritime transport, fishing and aquaculture, offshore oil and gas, and renewable energies. With globalization, population growth and coastalization, the demand for these sectors to produce more is also increasing. This in turn encourages for conflicts, if not properly managed and may have a negative impact on the economy. Potentially, shipping traffic will increase with time and may cause adverse pressure on

ports leading to a need for new port infrastructure development. Offshore renewable energy is starting to introduce its existence in South Africa adding to the already under pressure ocean space. Installation of communication cables and fishing are but other activities effective for economic growth of the country which calls for proper management tool to allow for their functioning without interfering or undermining others (GHK Consulting and Wilson, 2004).

Interest and experience in MSP is gaining momentum worldwide and clearly the benefits surpass the long term loss due to improper planning. These losses can best manifest themselves as environmental degradation within the maritime domain, loss of international trade due to ineffective ports infrastructure, and decline in health and welfare of the ecosystem affecting people depending on it for food security. GHK Consulting & Wilson (2004) and Ehler (2008) however agree in that actual quantitative evidence on economic benefits due to MSP are still limited, simply because most of these initiatives are still in their genesis or early stages. Thus, intensive assessment and evaluation of MSP is to be conducted. Ehler (2008) however, indicated that quantitative confirmation of MSP benefits will manifest with all likelihood in the next decade as proper plans are developed and implemented.

Other anticipated benefits from MSP notwithstanding economical are ecological and social or administrative. Ecologically, MSP induces management to have a holistic focus on ecosystem as opposed to single sites for protection and development. It supports for Ecosystem Based Management (EBM) approach by adopting economic and social agendas with respect to the environmental limitations or resources. Biological sensitive areas are prioritized and MSP tries to limit human interference as it allows for ecosystem conservation and provides for MPAs regulation. Administratively, MSP improves transparency; speed, quality; and accountability in decision making and regulation applications. It also gives provision for stakeholders' involvement, especially in its inception (Ehler, 2008). UNESCO-IOC (2010) also indicated that other than organizational stakeholders, MSP improves communities and citizen participation whilst seeking to protect their cultural heritage within the maritime domain.

According to GHK Consulting and Wilson (2004), in order to assess economic potential benefit MSP brings; it is important to have baseline information on key significant maritime sectors in relation to economic development.

5.1.1. Oil and Gas

South Africa's economy is mainly supported by its vast mineral resources; however, the country imports about 130 million barrels of crude oil a year on average (Plazier et al., 2013). This means that there is high dependence on maritime space, shipping and transportation for the functioning of South Africa's economy. Its primary crude oil sources are Iran, Saudi Arabia, Nigeria and Angola (in order of dependency); highlighting the importance of international trade maritime space provide for the country's development. Iran however was sanctioned and as a result, alternative source of crude was to be found. The country's refinery can only accommodate 250 million barrels annually (700 000 barrels a day) leading to a consumption of about 24.5 billion fuel liters a year. Gas alone is reported to be critical for the country's economic stability (Plaizier et al., 2013). As shown below (Figure 10), South Africa has started licensing prospecting for Oil and Gas exploration within its territorial waters.

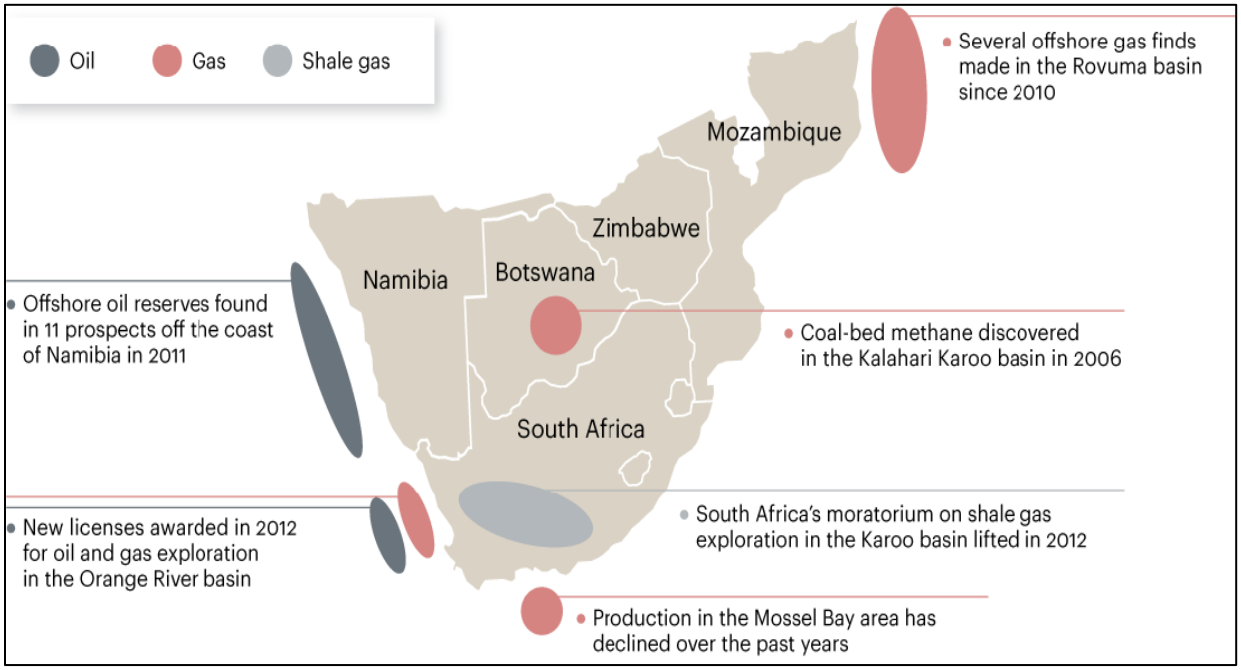

Figure 10: A map showing recent developments in the Southern African region with the sites awarded license for Oil and Gas Exploration in the Orange River Basin. Source: Plaizier et al., (2013).

5.1.2. Maritime Tourism

Whereas tourism plays an important strategic role in promoting and strengthening international relations, it also contributes towards economic development of the country. Proper investment schemes should be put in place to leverage sustainability of the sector as per the goals set in the NDP 2030 visions. In 2009, the tourism sector contributed about 8% of GDP and the Department of Tourism (2012) has designated plans and resources to up the GDP contribution to 20% by 2020 as alluded in the National Tourism Strategy. Maritime tourism is however not given enough attention in the strategy. This indicates that there is still of awareness towards opportunities and potentials that the maritime domain possesses in driving the country's development forward. There are opportunities for activities such as eco-maritime tourism (shark cage diving, whale watching, sardine run, coral reefs, and others); boating, yachting, cruising, ferrying; and recreational sports (sailing, swimming and diving) and leisure. These compliment a very rich and complex seascape along the South African coastline which provides opportunities to take advantage of in soliciting for a maritime economy.

5.1.3. Shipping and Ports

Although South Africa is not a shipping country, one would expect the shipping industry to contribute incalculably to the GDP of the country. Especially after establishing that seaborne trade accounts for about 90% of products per volume leaving and entering into the country. However, this is not the case as indicated in the Shipping Economic Study (Department of Transport, 2011). This is due to the fact that South Africa has no shipping registry as a country, therefore; shipping has no economic throughput. Notably, cargo handling and other maritime services are classified under the transport sector with port operations regarded as industrial activities. Ship building has declined to almost nonexistent state with irregular and infrequent harbor crafts and trawlers saving the industry from extinction.

At a local level, with Gauteng being the central hub and the heartbeat of the country's economy; transshipment between South African ports is negated. Durban is the busiest of all South African ports in terms of importing and exporting containerized products, as seen in the table below. The global recession in 2008 affected the import rate but recovered well in 2010 partially due to the

global recovery from recession. Exports kept improving even during bad global economic climate, much to the high demand from the Chinese or Asian markets for South African commodities.

Table 1: Summary of Cargo handled at the South African Ports in 2010. Source: Department of Transport, (2011).

	Bulk Cargo	Break Bulk Cargo	Containers (TEU)	Containers (Tons)	Total	Total Cargo Handled (Tons)
IMPORTS (TOP) vs. EXPORTS (BOTTOM)						
Richards Bay	5 602 813	141 530	1 248	11 232	5 755 575	**84 852 043**
	74 986 229	3 981 335	11 209	128 904	79 096 468	
Durban	27 807 874	3 052 391	903 525	8 131 725	38 991 990	**54 761 413**
	5 639 425	2 797 966	637 568	7 332 032	15 769 423	
East London	102 797	184 275	26 438	237 942	525 014	**1 003 191**
	105 419	353 622	1 664	19 136	478 177	
Ngqura	-	-	42 195	379 755	379 755	**746 996**
	-	-	31 934	367 241	367 241	
Port Elizabeth	246 608	638 566	71 592	644 328	1 529 502	**6 928 438**
	4 117 418	829 004	39 349	452 514	5 398 936	
Mossel Bay	636 049	-	-	-	636 049	**785 091**
	149 042	-	-	-	149 042	
Cape Town	1 713 146	43 175	178 582	1 607 238	3 363 559	**6 671 422**
	284 764	313 239	235 640	2 709 860	3 307 863	
Saldanha	4 732 262	32 939	-	-	4 765 201	**52 801 419**
	47 411 297	624 921	-	-	48 036 218	

Total	**40 841 549**	**4 092 876**	**1 223 580**	**11 012 220**	**55 946 645**	**208 550 012**
	132 693 594	**8 900 087**	**957 364**	**11 009 686**	**152 603 367**	

5.1.4. Fisheries

South Africa's mainland is bordered by a highly productive Benguela Upwelling System along its west coast in the Atlantic Ocean. It provides for fishing activities within the South African territorial waters, both commercial and subsistence. Bartholomae and van der Plas (2007) indicated that the Benguela Current exhibits high environmental variability spatially and temporally and as a result is one major upwelling ecosystem in the world. Commercially, the exploitable biomass of hake was estimated to have reached its highest at 572 000 tons in 2011 since 2000. The year 1996 was the highest productive year with 640 000 tons exploitable biomass, this due to the cooling and oceanographic mixing before the wake of the 1997/8 Benguela Niño event (Bartholomae & van der Plas, 2007; Statistics South Africa, 2013).

West Coast rock lobster commercial catches indicated a decreasing trend reaching 16 256 tons in 2011, the lowest in the past two decades. According to McCord and Zweig (2011), commercial fisheries contribute a paltry 0.5% to the overall South African GDP and generated an estimated revenue equivalent to R3.1 billion (ZAR) in 2008. Furthermore, the industry is accountable to 43 458 jobs in the country. The fishery industry also play an important role in forging bilateral and international relations as witnessed with the Large Marine Ecosystems (LME) initiatives on both the west and east coast of South Africa. International trade is also intensified through this industry with South Africa exporting fish stocks and fishery products equivalent to $75.547 408 worldwide with hake and rock lobster contributing 80% of this figure (McCord & Zweig, 2011; Statistics South Africa, 2013).

5.2. Maritime Spatial Planning and Broad Stakeholders Governance

Pomeroy and Douvere (2008) postulated that successful MSP implantation depends on the identification and understanding of stakeholders, due to the interdependency between the maritime environment and its different users. These understandings extend to stakeholders' practices, their expectations and interests for better cooperative governance. Cooperation and cooperative governance is believed to be significant towards unlocking the success of MSP implementation. Ehler (2008) underlined basic required principles for MSP governance and stakeholders' engagement as one important factor as related to the need for management of different marine areas or zones with different sensitivities, both spatially, temporally and human dimensions.

Maritime space governance is however not an event but a continuous process that seeks proper planning and cumulative monitoring through evaluation and research. These are all management imperatives, which stakeholders' employment and engagement will make it possible and feasible as opposed to single-body governance. Since MSP is a continuous and participatory process, all these functions need to be organized and rolled out from the earliest conceptualization period, through to the planning, implementation and monitoring. These functions are interdependent and need to be attended separately and concurrently at times, thus cooperative governance arguably is the best practice towards realization of MSP development. Ehler (2008) indicated that early engagement of stakeholders is very critical for long-term success of the process as it encourages trust and ownership from all participatory organs towards a successful MSP development.

Cooperative governance and stakeholder engagement will allow for identification of uses that are compatible and integration of information. This will give a holistic view of the current activities and those likely to create conflicts in the future. Stakeholders will put together their future visions and goals, however challenges exists in that companies might be hesitant to divulge their future exploration plans. This raise questions about political will and organizational trust amongst competing stakeholders with interest in maritime domain. However, working together definitely reduce future conflicts between the environment and uses allowing for maritime environmental sustainability.

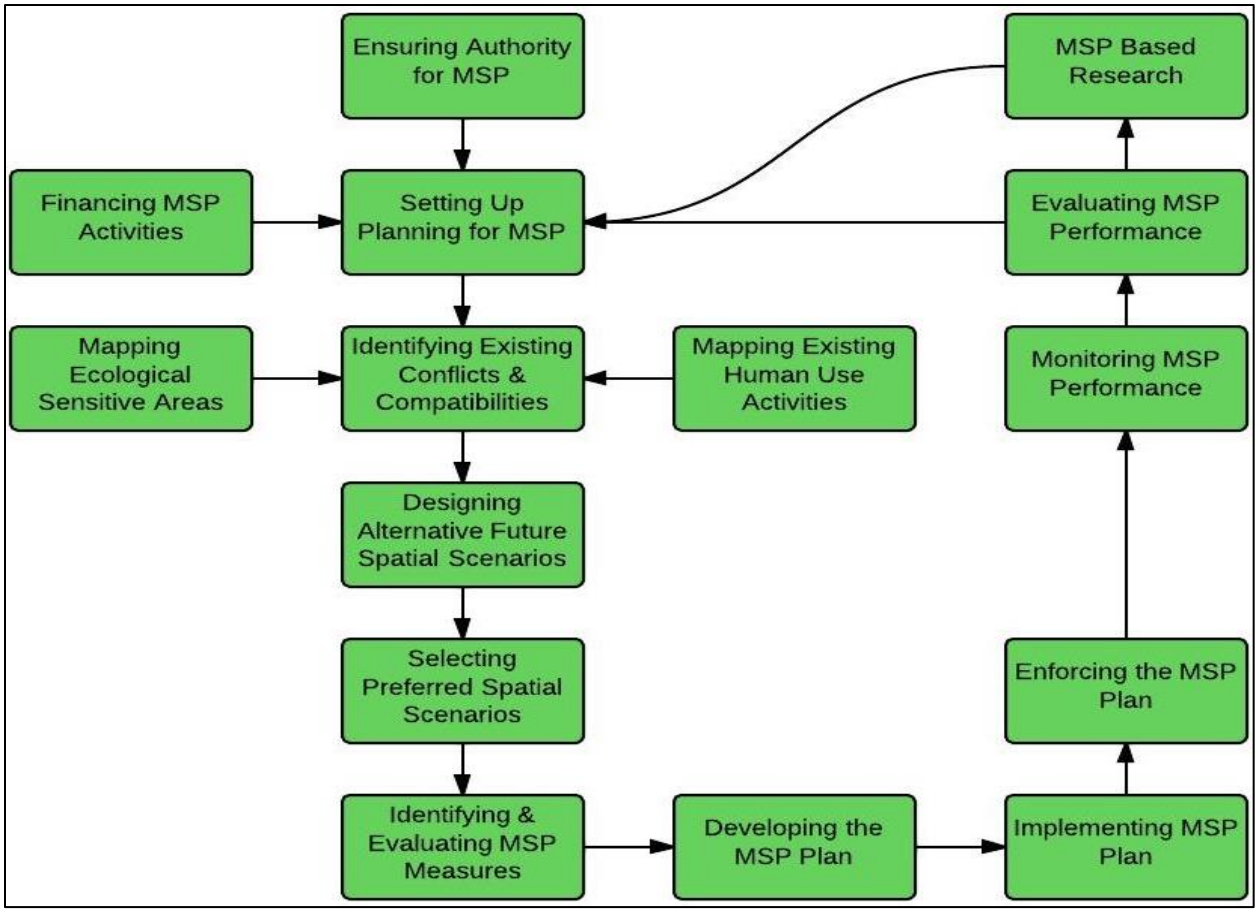

Figure 11: Schematic diagram showing fundamental Governance Principles of the Maritime Spatial Planning planning process.

UNESCO-IOC (2014) indicated that the definition of good governance for MSP development process is not definite as it differs per case, however there are fundamental principles guiding its application. This mechanism is grounded on the idea of getting people talking and sharing ideas towards a common goal and for MSP, it gives provision for initializing context and authority; plans for securing financial support; establish and analyze existing conditions and prognosis for future conditions; and working towards adapting and implementing the MSP plan. Figure 11 indicates that mapping ecological sensitive areas forms part of the initial steps to be undertaken during the MSP development plan. The next step from there is to identify existing conflicts and compatibilities in relation to human use activities mapping, and this will allow for designing alternative future spatial scenarios. These are followed by developing measures for identifying and evaluating measures, enforcement plan and monitoring MSP performance over set periods whilst allowing for research for advancing MSP development to be undertaken.

5.3. Case Study: Rhode Island's Ocean Special Area Management Plan

5.3.1. Background

To demonstrate the importance of intensive research and continued multiple stakeholders engagement towards the development of MSP, a case study on Rhodes Island's Ocean Special Area Management Plan (SAMP) is explored. SAMP is known to be the first MSP initiative to be formally approved through the United States' federal government. It is seen as a tool to help realize and best implement the US's Ocean Policy which was promulgated in 2010 (Olsen et al, 2014). Much more to its user conflicts arbitration, the SAMP initiative was also designed to be an assessment tool for any form of development in the area for issuance of leases and permits needed by developers. It took two and half years of intensive stakeholders' engagement and planning, and was initiated as a solution towards identifying a suitable location for future offshore wind farms. This got different stakeholders with different interest in the maritime domain to engage and fashion a befitting plan to benefit all with minimal tradeoffs.

SAMP's accelerated research and planning phase was locally adopted in mid-2008 and was then adopted into the State's Coastal Resources Management Council in 2010, with the Coastal and Ocean Resources Management (OCRM) office of the federal government approving it in 2011 (Olsen et al., 2014).

5.3.2. Governance Process

SAMP's main objective is to seek and create a balance and integrity between the entire ecosystem (including humans) and the overall cumulative impacts of human activities on the maritime domain, and find resort for the regulation of those activities in order to maintain or restore the ecosystem health in a sustainable manner. Olsen et al., (2014) defined governance as a process which formally and informally arranges and institutionalize structures influencing how resources are utilized; how problems and opportunities are evaluated and analyzed at what tradeoffs and acceptable behavior; and what are the rules and sanctions applicable to effect distribution of ecosystem's goods and services. The governance strategy was grounded on five

basic processes that are pivotal for implementing the SAMP initiatives as seen in the figure below.

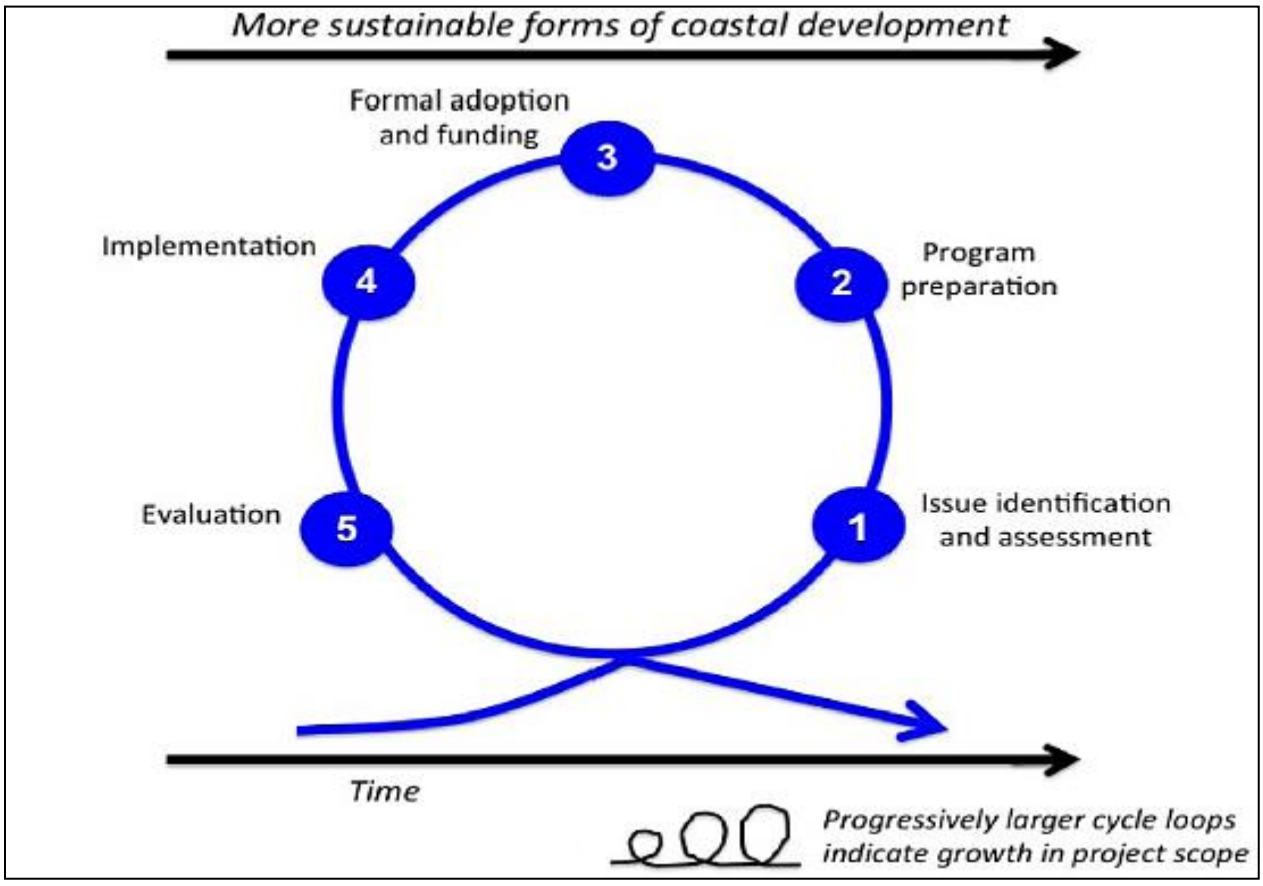

Figure 12: Fundamental steps and actions undertaken towards SAMP Management Plan. Source: Olsen et al., (2014).

Stage 1 was mainly devoted for Process Setting, where issues to be addressed, goals and spatial zoning of areas were defined. Assessment of research need and to be undertaken were also labeled whilst negotiating and seeking agreements for funding purposes. It gave provisions for first stakeholders' engagements for their buy-ins from the onset. Stage 3 was formal adoption of the draft SAMP policy draft, adoption of SAMP by Coastal Research following public hearings, endorsement of SAMP as a tool for permit application for activities and development within the territorial waters, and securing funding from the federal government and private organizations.

Stage 2 however, dealt with scientific capacity, tools compilations and program preparedness. Field studies for compatible, conflicting zones and uncertainties underlying the SAMP area were conducted adopting assemblage of traditional knowledge from fishers, sea-pilots, and recreational boaters. This entailed Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) to be conducted in the whole SAMP area. Findings were made available to stakeholders and were drafted into evidence based SAMP policy draft. Stage 4 of the process issues new development/activities permits within the SAMP domain whilst implementing coordination mechanism between State and federal governments. SAMP is a cumulative and progressive initiative, and is mandated to continue and adapt to new knowledge and emerging impacts of human activities allowing for enforcement performances (Olsen et al., 2014).

The last stage (5) is evaluation of the project and seeks to conduct assessment, the success rate at which SAMP achieved it's shared and sets goals as provisioned in its strategy framework. Based on the findings, policies and procedures will be reviewed at set time periods to provide for new and advanced functionality of SAMP in response to experience gained throughout the process taking into consideration variability in social and environmental conditions.

5.3.3. Conclusions

Olsen et al., (2014) indicated that the scope of planning and permitting has since doubled following the implementation of the ocean SAMP initiative. SAMP has regenerated these processes as they were historically based on case by case leading to inconsistencies, conflicts, prolonged delays and loss of confidence from the public. Therefore, SAMP brought a distinctive multi-sectoral coordinated approach which enjoys considerable understanding, trust and support from private and public sector stakeholders. Preliminary findings indicate that this approach promotes an ecosystem stewardship ethics with its transparent and efficient decision making as observed within the Rhodes Island Coast.

Chapter 6

Maritime Spatial Planning: The South African Context - Analysis of Surveyed Data

In investigating the importance and need for MSP in South Africa, a survey was conducted to gather very specific and focused data within the maritime sector. The survey was developed to cater for a variety of practitioners in the maritime domain in South Africa ranging from government departments, private and government agencies, universities, researchers and many others at all levels of their careers from juniors to senior managers. From the survey, it is expected that an understanding of South Africans' perception about MSP will be annexed and unfolded. Additionally, the results will provide insights and initial understanding to form baseline for further research and decision making processes.

6.1. A conjecture that is Maritime Spatial Planning in South Africa

Globally, MSP is relatively a new phenomenon which saw its emergence due to high demand for offshore renewable energy exploration**.** White et al., (2012) postulated that renewable energy is amongst the fastest growing maritime space uses. Resultant to that are debates on how it will be accommodated in the already stressed ocean space. Although South Africa has not yet fully explored and utilized the ocean space for renewable energy resources, it is proposed that in accordance with the NDP 2030 vision; about 20 000 MW electrical energy should be renewable by 2030 (National Planning Commission, 2011). Ocean zoning however has been practiced in

South Africa at sector based approach, for example MPAs. The imperatives then of developing MSP in the country are not clearly understood by many who are practicing within the maritime domain since there is no blueprint or any policy guidelines pertaining to such initiatives.

From the survey, we deduce fundamental but valuable information necessary for providing the guideline and basis for further research. It came out that South Africa has and is experiencing conflicting activities in its maritime space (see Appendix B). Therefore, a public orientated process which looks at managing human activities and their impacts on the ecosystem health within the maritime space is to be implemented. Moreover, the process will reduce users and use conflicts across the board. Most concerns with respect to conflicting activities were mainly on resources exploitation and need for conserving the ecosystem and protecting the environment. The resources mentioned most are fisheries, oil and gas, and diamond mining in the Orange River mouth bordering South Africa and Namibia. Whereas more than 65% or two thirds of world oil reserves are found in the Middle East and Russia (Calder, 2005), South Africa is in a verge of breaking the ground when it comes to offshore oil mining. Recently, offshore oil and gas exploration sites have been proposed along the west (Orange Basin Exploration Area (OBEA)) and east (Deep Water Durban Exploration Area) coasts of South Africa (Figure 13). It is expected that the exploration activities in the OBEA region will disturb and plunge the large pelagic long line fishing. Within the OBEA, about 40 866 hooks were recorded on an annual scale between 2008 and 2012 amounting to an average of 0.9% of the total national catch (ERM, 2014).

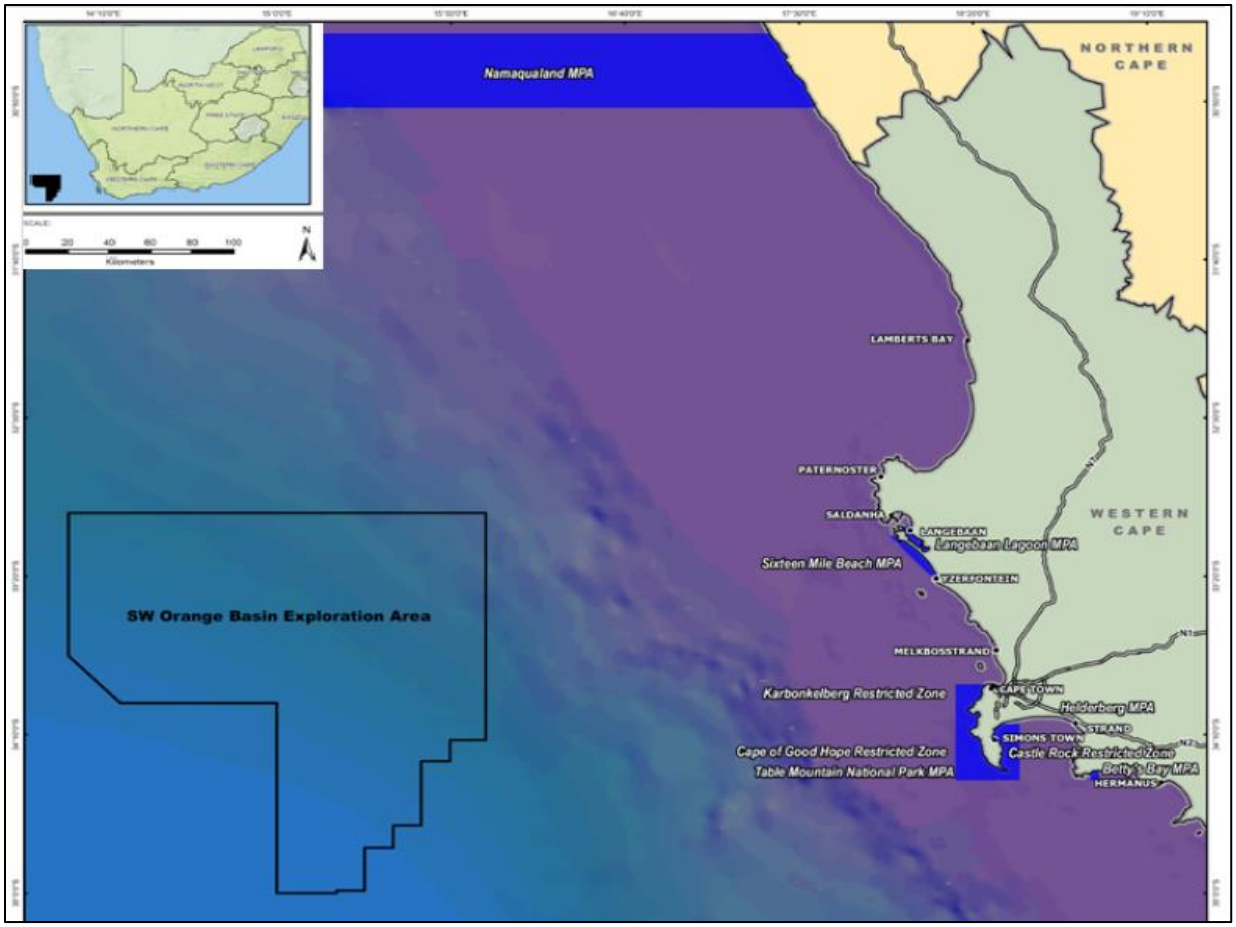

Figure 13: The Orange Basin Exploration Area (shaded on the inserted map on the top left). Source: ERM (2014).

Along east coast, with Durban and Richards Bay being the busiest ports in the country in terms of container and bulk (mostly coal) cargo respectively, the envisaged exploration in the Deepwater Durban Exploration Area (Figure 14) will prove to act as a speed hump on the volume of shipping traffic in the area. The east coast flanked by the quasi-tropical waters of the Agulhas Current is renowned for its adverse biodiversity of more than 10 000 species (Turpie & Wilson, 2011). These species represent about 15% of overall marine species globally, making the region very pristine and known for its eco-touristic charm. It is expected that exploration of oil and gas in this area (12.4 million acre) will catalyze conflicts on the maritime use and compromise ecosystem health in the region.

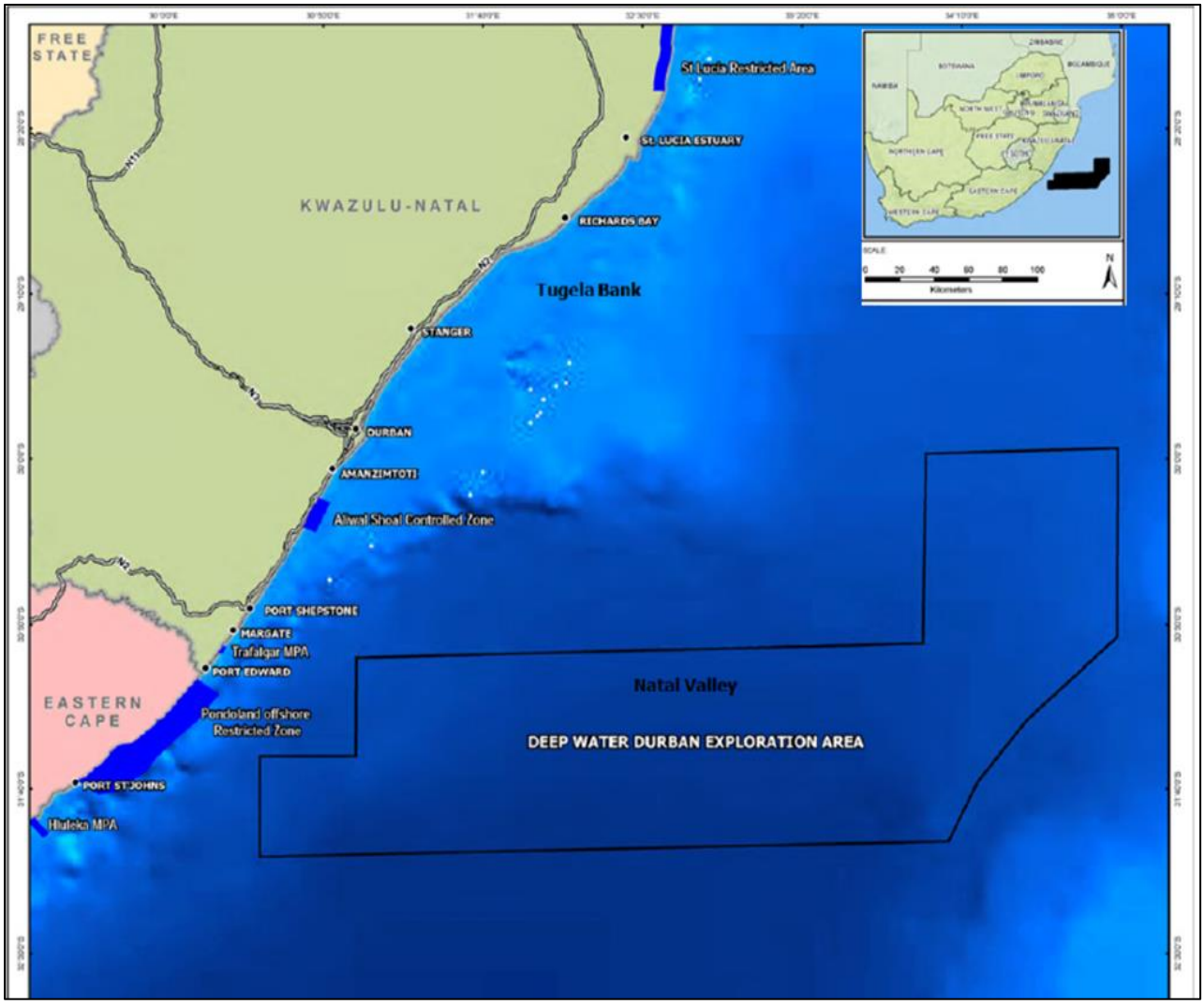

Figure 14: Map indicating the Deepwater Durban Exploration Area. Source: ERM (2014).

Other potential or emerging conflict indicated in the survey is that between the fast growing fishing practice of Aquaculture and their proximity to commercial ports infrastructures. Figure 15 below shows area with prominent aquaculture practices along the coast. Aquaculture forms the basis of the envisaged blue economy and has grown by 8 to 10% in the past two decades as it contributes significantly towards food security and seafood production. According to FAO (2010), abalone is the most abundant and farmed species in South Africa estimated to make 21% of the global market. Other developments of aquaculture practices are reported throughout the South African coast with salmon and cob being farmed in Gansbaai and Mossel Bay respectively. Zoning of areas to construct aquaculture farms must abide or be informed by

several statutory legislative guidelines such as the Municipal Zoning Schemes, EIAs, Aquaculture Development Zones (ADZ), Marine Living Resource Act (MLRA), National Ports Act (NPA) and other frameworks due to its sensitivity in terms of species adaptability and commercial value attached to it (DAFF, 2013). MSP development will prove beneficial in addressing and negating these conflicts whilst seeking solutions that are economic orientated without undermining other responsibilities.

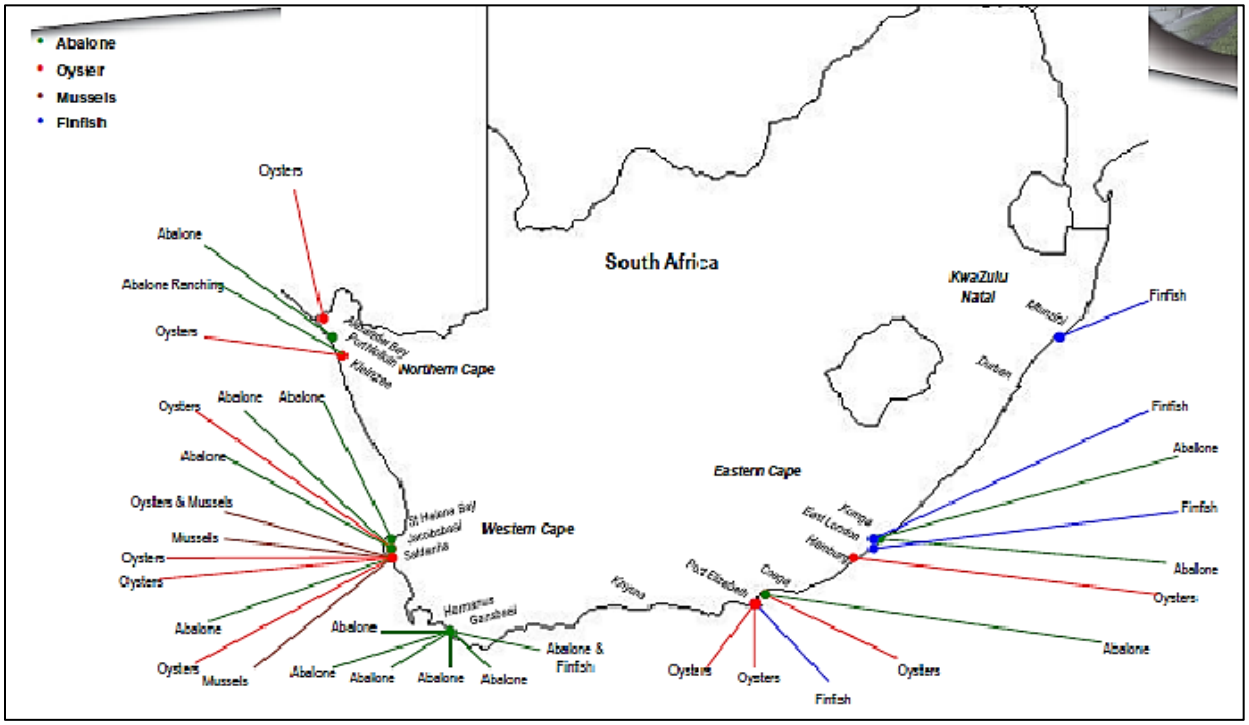

Figure 15: Marine aquaculture species (Abalone, Oyster, Mussels and Finfish) and farm distribution in South Africa. Source: DAFF (2011).

The results of the survey show that, MSP development should be a top priority within the government agenda. It will help shape the maritime industries in terms of cooperative and collaborative governance thus enabling effective implementation of plans, policies and other guidelines which to eventually enhance economic stability and growth of the country. Seemingly, the Department of Environmental Affairs (DEA) is entrusted with leading the MSP development initiative. Most responses cited the existing capacity and experience the department has with respect to conducting maritime research and other related activities such as preserving and protecting the maritime environment. Initiatives such as MPAs should be used as baseline

and MSP be an expansion from the success of those programs whilst increasing the scope by adding all the significant maritime space use activities to these existing plans.

A significant number identified the South African Maritime Safety Authority (SAMSA) as the rightful home for the project. They are the sole custodian agency endorsed by the government to maintain and safeguard the safety and operation-ability of the whole South African maritime domain. Invoking the SAMSA Act 5 of 1998, the maritime safety authority is mandated *"to "ensure safety of life and property at sea, prevent and combat pollution of the marine environment by ships, and to promote the country's maritime interests"* (Republic of South Africa, 1998b). Other options identified for leading role towards MSP development includes the fisheries branch of the National Department of Agriculture, Forestry and Fisheries (DAFF); whilst an insignificant portion proposed an independent entity to be established from a collage of collaboration of stakeholders engagement lead by universities. This will promote independent and objective leadership minimizing bias towards or against other sector's prioritized over others.

In this study however, we argue that options such as development of a new maritime affairs department should be explored. It will be responsible for governing and management of all maritime activities as dictated by the MSP plan and guided by the NDP 2030 goals. Key maritime related sections from various departments will then be retracted and transformed into components of the new ministry. This will enable smooth, efficient and harmonized functioning with quick turn-around time as consultation will be in-house and under the leadership of the same minister. The departments in question include DEA, DAFF, DoT, DMR, DoE, DST, Arts and Culture, Defense, Communications, Tourism, and Economic Development.

In agreement with both Olsen et al., (2014); Pomeroy & Douvere (2008); Douvere & Ehler (2009); Glazewski (2013) and Harris (2012); stakeholders engagement came out as the most important aspect of planning and governance towards a successful MSP development. These stakeholders must be a full embodiment of all organs linked to conservation, environmental protection and management, maritime research councils and agencies, institution of high learning, traditional and cultural community representatives, government departments, private

companies with offshore and/or inshore interests, municipalities, economists, lawyers, scientists, and the public in general (see Appendix B). For South Africa to become a maritime economic country, development and usage of MSP as a planning tool is paramount. MSP is seen as a tool with an enabling capability to steer maritime activities to form the cornerstone of economic development and sustainable growth. However, this calls for all stakeholders to have an understanding in working together towards a common goal such as making South Africa a maritime based economy. Harris (2012) strongly argued that MSP is a tool for planning and management of coastal bioregions, however; we believe that it is much more versatile and has great potential to unlock and arbitrate more complex systems beyond such improvident view.

In this study, inferences are made to the UNCLOS's limit for coastal State's jurisdiction as baseline for defining the coastal area. MSP is seen as an instrument to benefit the country by stabilizing the economic practice and help ease tensions amongst maritime space users, which will eventually improve efficiency in their core businesses or practices within the EEZ. With the political climate and the dynamics rippling off such paradigms, patience must be exercised for MSP to reach its full potential and begin producing quantifiable results. The planning phase, as indicated in the previous chapters that having too many stakeholders can hamper production and lead unhealthy paradoxes, thus patience at that stage of deliberations is expected to be optimal.

Contrary to the finding by Statistics South Africa (2011), that skills development in South Africa is lower than the Organization for Economic Co-operation (OECD) average; the survey findings indicates that South Africa is capacitated to deliver on such a challenging task with respect to maritime sector practices. A fraction of the respondents however indicated that the skills level in the country is not sufficient, especially in the technological and engineering disciplines. This calls for directives to invest in policy development which influence and promote graduates to follow those careers on the deficit as a country. Recommendations were made to engage the African Union and BRICS partner countries for support and training of graduates by hosting them at their institution of high learning. It is believed that proper planning towards MSP development without political infiltration and interference will assist in winning the investors' confidence to invest in the maritime related activities, and help create jobs. This will eventually rectify or improve past economic, social and ecological imbalances. On governance, MSP will

help form the basis for long term policy making and improve South African legislature, monitoring, compliance whilst getting the best out of the maritime environment. There is qualitative evidence that MSP as a systematic planning tool can minimize losses and environmental degradation whilst improving synergistic benefits both financially and ecologically (White et al., 2012; Harris, 2012; Ehler, 2008; and Agardy et al., 2011)

Chapter 7

MSP Policy Development: Comparative study analysis between South Africa and other countries

Maritime Spatial Planning is gaining significant attention globally and several countries have taken a lead in developing this tool for sustainable maritime environment use. It intends resolving current and potential conflicts; and to achieve a well-coordinated governance mechanism that allows for all maritime space activities without hindrance to other equally important use whilst maintaining the integrity of the environment. In this chapter, a look at the Germany MSP development process, policies and related regulations is piloted.

South Africa is a member of the BRICS (Brazil, Russia, India, China, and South Africa) countries, a consortium of five nations within the G-20 countries with distinguished quick growing economies and substantial influence on their regions. Thus, imperatively; we look at China's MSP initiative and investigate what lessons can be learned from them.

7.1. Maritime Spatial Planning in the North Sea – The Germany Case

In accordance with UNCLOS Part V, Article 56 (United Nations, 1982), Germany has full sovereignty and exclusive rights over an EEZ covering an area about 33 100 km^2, 28 600 km^2 along the North Sea and 4 500km^2 in the Baltic Sea. Germany have developed both MSP management plan for all these maritime territories, however for the purpose of this study, we look at the North Sea initiative. The North Sea hosts some of the major ports in the world. Port

of Hamburg in Germany, was ranked at 27 globally with a total cargo handling capacity of 130 938 000 tons a year and ranked 14th with respect to container traffic at 8 889 477 TEUs/year, based on 2012 statistics (AAPA, 2013).

The inception of MSP in Germany was brought into being as a result of immense interest and pressure from the Federal Government Strategy for the "Use of Wind Energy from the Sea" which was adopted in 2002. This strategy forms part of the Germany's sustainability framework and aims to minimize dependencies on imported conventional energy sources whilst promoting and allowing for optimum exploitation of offshore wind energy. Most importantly, the Renewable Energy Act of 2008 summons the State to produce 20 000 to 30 000 MW from offshore wind farms by the year 2020. The Act also stipulates that guaranteed subsidy are to be provided to those investing towards wind generated power (BSH, 2009). A large number of applications were received with several projects overlapping in space and time raising concerns on the integrity of the environment and impacts on shipping in the area (UNESCO-IOC, 2009).

Special care and due diligence were given to the shipping industry as the main focus and major economic driver for Germany. This means that, shipping took preference over many other uses and MSP was seen as a tool to minimize barriers or disruptions to navigation routes which lead to increasing safety and efficiency of seaborne transport. According to UNESCO-IOC (2009), the Germany MSP initiative was developed around the following focal points:

a) Securing and strengthening maritime traffic,
b) Strengthening economic capacity through optimization of space use,
c) Promotion and provision of maritime space for offshore wind energy in accordance with the federal government's sustainability strategy,
d) Safeguarding long-term use of special characteristics and potential in the EEZ through reversibility of uses, economic use of space, and priority for marine specific use,
e) Securing natural resources by avoiding disruptions to and pollution of the marine environment.

7.1.1. Securing and Strengthening Economic Growth

Germany is the leading economy in Europe and fourth in the world. Although not rich with natural resources, it is the second largest exporter in the world thanks to their manufacturing sectors (motor vehicles, machinery, chemicals, electronics and computer products, transport equipment and many other). According to CIA (Fact Book, 2014), Germany exported commodities to the value of $1 493 trillion in 2013. Shipping sector therefore forms the pillar of economic stability and growth in Germany employing about 500 000 people (BSH, 2009). Both the North and Baltic Seas' welfare is significant for the functionality of the shipping sector and ultimately the economy of the country. They both act as gateways to the international markets. Notwithstanding UNCLOS (United Nations, 1982) provisions for freedom of passage by foreign ships over coastal States' territorial waters, Germany designed main navigation routes and frequently travelled routes as fundamental (primary) frameworks of their MSP initiative. Other maritime uses are seen as secondary and must align themselves with minimal distraction to these shipping routes. Furthermore, no installation or construction is allowed to be installed or constructed in areas surrounding shipping routes as they are given a top priority status important for international trade.

7.1.2. Securing and Strengthening Maritime Traffic

With Germany being one of the leading exporting nations, trading with partners in France (9.21%), United States (7.85%), United Kingdom (6.53%), Netherlands (6.33%), China (5.91%), Italy (5.05%), Austria (5.03), Switzerland (4.3%) and Belgium (4.04%); shipping is responsible of transporting about 90% of foreign trade and 40% trade within the Eurozone (IMO, 2012). According to BSH (2009), about 68 000 movements of ships longer than 50 meters were recorded in 2005 along the German Bight alone. Shipping enjoys unprecedented priority over any other maritime space use in Germany. This can be witnessed through the schematic indicating zones demarcated for shipping routes in the Germany's North Sea territorial waters (Figure 16). Other functions or use that are not compatible with or distracting shipping activities are not permitted as they are seen as threat to economic development and growth of the country.

With this high volume of shipping activities, however come other taxing challenges such as oil pollution, air pollution or chemical pollution, and invasion of foreign species through ballast water operations. Therefore, stringent control measures to mitigate emissions and oil discharges in their EEZ are required. These are in accordance with the MARPOL Convention and its Annexes which regulate prevention of Pollution by: Oil (1983); Noxious Liquid Substances in Bulk (1983); Harmful Substances Carried by Sea in Packaged Form (1992); Sewage from Ships (2003); Garbage from Ships (1988); Air Pollution (2005); and the famous Ballast Water and Sediments Management (BWM) Convention (IMO, 2012). Another regulation governing shipping activities with respect to pollution is the OSPAR Convention of 1992 which is instrumental for international cooperation and best environmental protection practices in the North-East Atlantic ocean region (BSH, 2009).

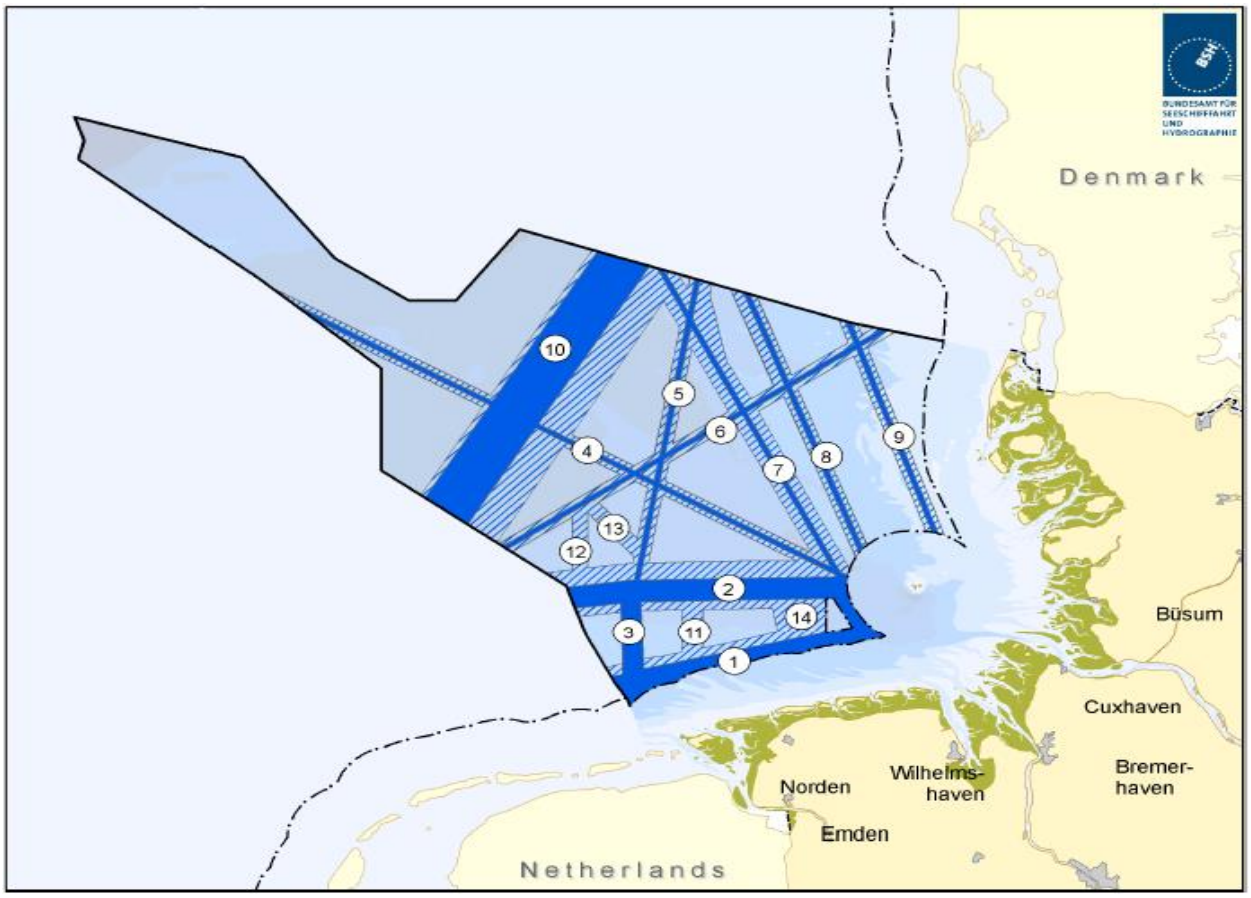

Figure 16: Maritime Spatial Plan over the Germany's North Sea Exclusive Economic Zone illustrating shipping routes in the area. Source: BSH (2009).

7.1.3. Promotion of Offshore Wind Energy Use

Offshore wind energy farms in Germany are largely in the high seas beyond the 12 nm (Nautical Miles) territorial seas where the winds are stronger. Currently (June 2014), about 630 MW capacity of wind generated power is connected to the national electricity grid. In the North Sea however, there are 146 Wind Energy Turbines operation producing about 580 MW capacity contributions into the national grid. Three offshore wind farms are currently in operation and eight (8) under construction, with six (6) expected to start operating later in 2014 and two (2) more approved with construction expected to start in 2015 as shown in Figure 17 below (Offshore-WindEnergie, 2014).

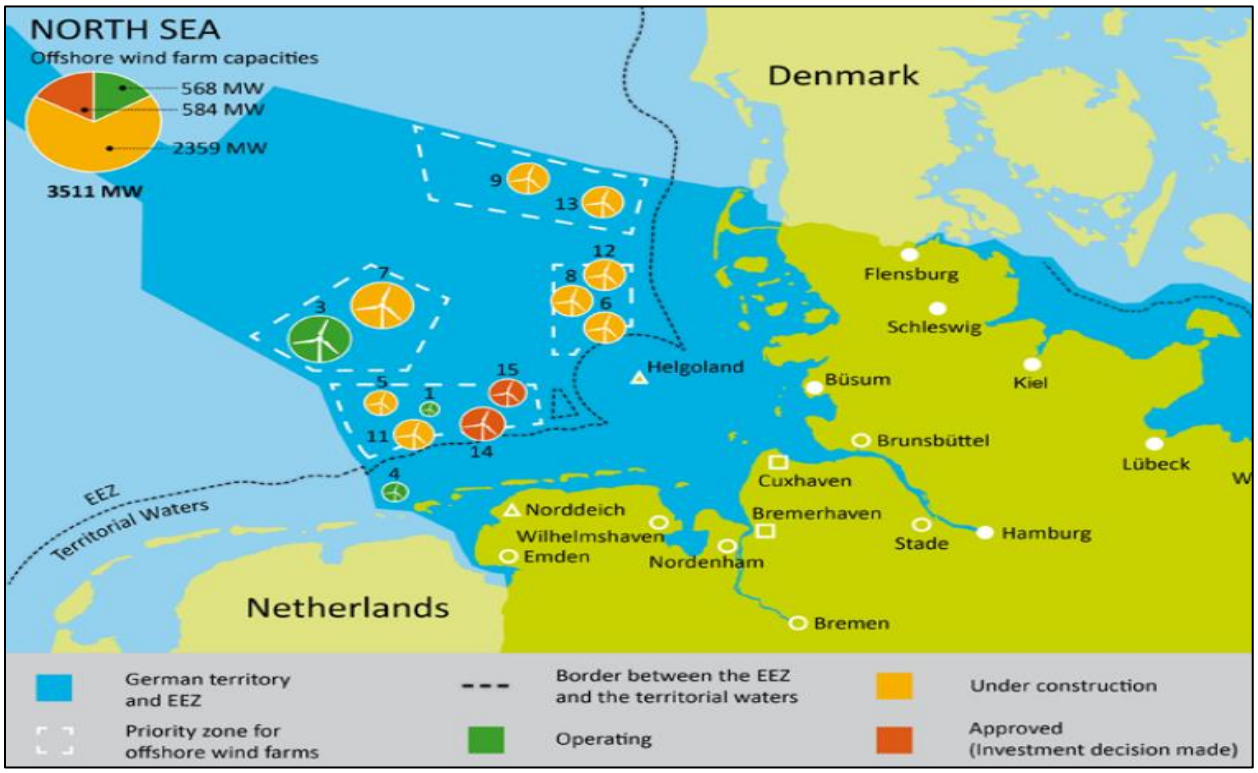

Figure 17: A map showing offshore wind energy activities within the Germany's North-Sea Exclusive Economic Zone. Source: Offshore-WindEnergie (2014).

The Renewable Energy Act of 2008 regulates and gives provision to all the offshore wind farms activities in the area. This Act has since been adopted to strengthen the Federal Government's Integrated Energy and Climate Programme (IEKP) which promotes climate protection and is envisioned to produce 30% of renewable energy in the national grid by the year 2020.

Progressive evaluations of short term progress are planned for certain time frames and the renewable energy contribution (target) may be raised at least after 2020. Thus from these organs of the federal government, MSP in Germany is expected to continue playing a significant role in reconciling maritime space use and to implement the government's resolutions and economic agendas (BSH, 2009). Other maritime space use such as power and communication cables, research sites, cultural heritage sites, military use, leisure sites are but secondary priorities to those discussed above.

7.2. The Chinese Marine Functional Zoning Plan

The People's Republic of China has a very rich and diverse coastline of 14 500 km and is party to many international treaties governing their maritime activities complementing their domestic regulations. Economically, according to (CIA, 2014); China was the leading global exporters in 2013 exporting commodities to the value of $182.8 trillion. These commodities include but not limited to electrical equipments and machinery, data processing equipments, apparels, radio telephone headsets, textiles, and integrated circuits. Their international partners include Hong Kong (17.4%), United States (16.7%), Japan (6.8%), and South Korea (4.1%). China was also ranked the third importing country in 2013, with imported goods to the value of $1.95 trillion. Emanating from these, China's ports are amongst the busiest in the world.

According to (UNCTAD, 2013), China's domestic demand for commodities due to their exponential economic growth helped improve international seaborne trade and saw a 4.3% increase in goods per volume being shipped globally in 2012. China has seven major commercial ports and they are all ranked in the top 13 of the World's Busiest Container Ports per volume in 2012. The port of Shanghai was recorded as the busiest in the world, handling about 32.53 Million TEUs in 2012 (World Shipping Council, 2014). With this intensive volume of maritime traffic, other uses and users were bound to be threatened. The general maritime ecosystems also faced and continue to be in a state of compromise due to high pollution from ships and invasive species.

China is also ranked amongst the highly bio-diverse countries recording more than 35 000 marine species with very high portion of endemic organisms representing about 10% of the overall world species (Environmental Protection, 2008). To manage these rich diversity within the China Sea region, promulgation of regulations and control measures whilst improving socio-economic growth and maintaining the general maritime environment's integrity is very important. Management tools such as the National Marine Functional Zoning (MFZ) Plan was adopted in 2002 under the State Oceanic Administration (SOA) dividing marine areas according to their best practicable function or use whilst identifying priorities for conservation of the environment (Wenlian et al., 2006).

7.2.1. Fundamental Principles Governing Development of Marine Functional Zoning Plans

Quoting UNESCO-IOC (2009), "*In responding to the policy of China's national government to rigorously enforce laws governing the management and protection of land, water, forests, minerals, and seas, the State Oceanic Administration officially proposed the formulation of a law to manage sea use".*

Important to consider is that MFZ plans are only developed and implemented within the 12 nm (Nautical Miles) territorial sea. These plans divide sea areas according to natural resources, socio-economic use, and ecological features. MFZ has since then (2002) became the cornerstone for maritime development planning in China. Its regulative or legislative tool is the "Law on the Management of the Sea Area Use of the People's Republic of China" which was adopted at the 24th Session of the Standing Committee of the 9th National People's Congress in October 2007 (UNESCO-IOC, 2009).

7.2.1.1. The Management of the Sea Area Use Law

According to (Li, 2006), this law was enacted to strengthen integrated coastal management in China after the country was experiencing high volumes of maritime activities on the face of its economic development. Currently China experiences an annual GDP growth of about 20% since the early 1990s and as a result ocean use activities have multiplied and diversified. Due to lack of

proper management and legislative frameworks, the ocean space was in the space of "*Three No's"*. There was *"no order"*, *"no control"*, and *"no fee"*; hence ocean users were using the maritime space especially coastal zones carefree, without any specific order and at no cost; notwithstanding the overall cost of depleting the whole ecosystem health from such deleterious acts. The People's Republic of China then felt a need to rethink and develop frameworks that will enable them to reverse the entire negative maritime state outlook. It was established that the existing laws were unable; to effectively regulate conflicts amongst various sectors' sea use; to put together a system for sea-sue management and user-fee strategy; and to put prosecute violations and maintain peace and order within the users.

To improve on those short-comings, a Law (SOA, 2002) was then enacted based on the following three main principles:

a) "*The right to the sea-use authorization system"* – the preamble to this being that the seas (internal and territorial seas) belong to the State and its Council has full ownership of the sea territory. It gives provision solely to those entities or individuals seeking to use the sea-space the right to apply for a license or declaration to use the authorized space for a given period of time, as per the government's approval.

b) "*The marine functional zoning system"* – this principle endorses the law and mandates all sea space users to comply with the State's MFZ scheme. It regulates and gives guidance for coherent and scientific exploitation and use of the maritime space.

c) "*The use-fee system"* – all the users complying with all stipulated rules and regulations are protected under the State's legal authority. However, this principle enforces all the potential sea users to pay a stipulated fee. The State Council has the right to exempt or reduce the fee based on the prospective intended use.

7.2.1.2. Impacts, Implications and Future Redress of the Law

The benefits of the MFZ and the Law on Sea Use Management are apparent and endorsed in the observed positive marine ecosystem improvements at a short-term scale, although the period is not long enough to impact on the long term ecosystem health state of the sea areas. Li (2006) indicated that through these initiatives, the excessive and disorderly free use of ocean space has

been restored gradually and continue to improve. Resultant from this promulgation, congruency in several industries has been observed with illegal occupation of coastal areas around major commercial ports being abated. These frameworks also assisted and enabled sea-users to acquire legitimate license to explore sea space resources. Accounting to the assumed law, marine eco-environment and its resources improved and allowed for sustainable economic growth to propagate.

More importantly, the new law helped in limiting distribution of industries with high energy, high pollution and high natural resource input along the coast. These tools also helped in implementing system to control the total pollution load dischargeable in the sea area. Strict implementation of environmental quality standards of MFZs were improved whilst carrying out periodic survey, monitoring and assessment of the ecosystem health within the sea zones. Management of overall marine environmental risks was also improved owing to the emergence and implementation of mechanism against marine accidents and also promotes MPA networking. These restored marine environment and eventually enhanced ecological goods and services, and benefited the economic climate of the country.

7.3. Results from Comparative Studies between South Africa, China and Germany

Although MSP in South Africa is not legally endorsed at national level; it is indeed a prominent feature within marine and maritime environmental management and governance discussions. Additionally, South Africa is working on setting up government coordinating structures and working groups towards planning and driving baseline research for MSP development. This is believed to be a strong foundation that will enable MSP development initiative to get off the mark and gain momentum with time in South Africa. These processes will be driven by domestic regulatory tools such as the ICM Act (Celliers et al., 2009) and the UNESCO step-by-step MSP guideline. Step 1 of the guideline emphasizes on the need for identifying and establishing appropriate authority for MSP development planning (C. Ehler & Douvere, 2009). This will provide clear leadership frameworks and give authority for new legislations to be established as agreed upon by stakeholders driving the thought process. South African government has taken

responsibility to satisfy this requirement and is therefore seen as the custodian for pioneering this initiative, with DEA assuming the leadership role.

A summary of the case studies' comparative analysis is given in tabular form below. Highlighted on the table are some of the important guiding principles necessary for a successful MSP development. With South Africa working on developing this initiative in the foreseeable future, these principles are seen to be important and are to be complied with for a sustainable MSP development plan providing for economic growth whilst maintaining the balance and integrity between social and environmental agendas.

Table 2: Comparative analysis summary for MSP development in Germany, China, Rhode Island (US) and South Africa.

	South Africa	**China**	**Germany**	**Rhode Island (US)**
Guiding Principles	-Best use of sea space. -Sustainable use of marine resources for future generations. -Balancing sustainable development and environmental protection. -Need to assist in rectifying past economic, social and environmental imbalances. -Economic growth should take precedence with current environmental regimes protecting and conserving the environment.	-Right to the sea-use authorization system. -Marine functional zoning system. -User fee regulated system.	-Securing and strengthening marine traffic. -Strengthening economic capacity by optimizing sea-space use. -Promoting offshore wind energy. -Safeguarding future economic use of the EEZ. -Securing natural resources by minimizing marine pollution.	-Investing on offshore wind energy. -Fostering properly functioning integrated economic and ecological system. -Encourage marine based economic development.
Guiding Act	Currently there are several components of Acts (NEMA) which may be used to guide stakeholder participation; however an Act or MSP related policy need to be developed.	Use Management Law (2001).	Federal Spatial Planning Act (1997).	US National Ocean Policy (2010).
Lead Agency	-Department of Environmental Affairs	State Oceanic Agency (SOA).	Federal Maritime and Hydrographic	Rhode Island Coastal Resources

	(Oceans and Coast) – Impromptu basis. -This study provides advocacy for new Maritime Affairs ministry to lead in all maritime related matters.		Agency.	Management Agency.
Legal Status	Should be enforceable.	Enforceable.	Enforceable.	Enforceable.
Relation to MPA	-Should utilize MPAs as baseline frameworks for expansion. -Need for full MSP mapping to be conducted for the broader EEZ area (Opportunity for further studies and project initialization).	Concurrent processes.	45% of German EEZ is considered MPAs under Natura 2000 and are part of MSP plans.	MPAs were considered constraints for MSP development (inflexible boundaries).
Drivers	Potential space user conflict as the country evolves towards a maritime based economy.	Capital generation from private use of public resources.	Conflict between projected wind farms, marine transport and nature conservation.	Offshore wind farm.
Stakeholders Participation	Need for extensive stakeholders engagement especially at the initial planning phases.	Limited to other ministries or government departments.	Mostly consultation with federal agencies and public participation.	Extensive throughout MSP process, continued during and after implementation.
Sectors	Need for screening sectors as per intended investment towards economic development.	All sectors.	Shipping, Pipelines and cables (Natura 2000 dealt with environmental conservation issues).	All sectors including fishing.
Financing	-Policy requirement to regulate financing of MSP development. -Nationalization of the maritime space and implement user charge model to generate funding.	Funding generated through a user charge system.	About 1 million Euros for maintenance a year.	$8 million for setting up.
Evaluation	Policy guidelines to be developed during initial planning.	Not specified.	Not specified.	Fixed review every five years.

Chapter 8

Recommendations: Are radical reforms the answer for Maritime Sector development in South Africa?

In this chapter, insights on which direction South Africa need to take as a way forward will be conferred with more cognizance around MSP realization. Mechanisms such as governance, policy frameworks, legal provisions, stakeholder cooperation, and political-(governmental)-will are seen as significant elements attributable to a successful MSP development. It is believed that a well-developed MSP encompassing current and future prospective maritime use will help arrest conflicting activities.

8.1. An Educated Drive towards a Maritime Economic South Africa

The maritime sector in South Africa is a closed book to many. A trait that can be weighed on the government shoulders due to lack of awareness on how significant it is to the people of South Africa. A point in case, for example is that primary and high school curriculum covers very little or nothing about maritime education. Impacts of this shortfall are apparent on the number of tertiary institutions offering maritime studies in their curriculum. With an overall 11.3% (Statistics South Africa, 2011) tertiary educated people in the country, it is safe to say that the state of maritime experts in South Africa is facing an apocalyptic future. For a State to perform well economically, a lot of input and investment should be made to overwhelm or excite the output from its initial base to a second order state, academically. Throughout the study, tentative

arguments are made supporting the notion that economic growth should be the focal point of any environmental initiative. High economic demands are seen as good drivers towards improved environmental or resources management and these calls for quality planning and good environmental protection measures. Strong capital is a requisite for quality and advanced environmental protection measures, thus without a strong economic stronghold; positive results may elude such initiatives over a long term period. Panayotou (2003) postulated that the best and surest way to advance environmental resource base is to get richer.

There is "*prima facie"* evidence that development of the country or economic growth is good for the environment around it. "*The burden to proof at this instance shall be left to the reader".* It is accepted that the reverse can also be correct, however; for the purpose of this study, we will not explore much into this discussions. In its inception, this study was developed to exhibit the importance of MSP initiative in appropriating balance between economic needs and environmental protection for the betterment of the country. However, as discussed in Chapter 7; economic considerations were prioritized over other maritime space use during the initialization process of MSP in Germany and the Eurozone region and in the People's Republic of China. As a result, these two countries are doing very well economically whilst environmental integrity is being maintained and improving with time. Both Germany and China are in the top 6 of the world richest countries in the world in terms of their purchasing power parity (Factbook, 2014).

The subject of sustainability is based on the fundamental balance between its three bottom lines, economic, environmental and social. Although very difficult to equally satisfy all three within the same ecosystem; MSP development strives to best allocate each of them spatial elongation which allows for exceptional developments with time. Panayotou (2003), however indicated that countries can achieve economic demands and growth by simply investing on growing the economy without special attention on the environment. He (Panayotou, 2003) learned through the study of the Environmental Kuznets Curve (EKC) that the environment is guaranteed to be worse before getting better with time and argued that countries must channel their limited natural (environmental) resources towards achieving rapid economic growth. A trait which seems to follow the notion that it's always darkest before sunrise. This will allow countries to move quickly out of the uncomfortable economic and unfavorable environmental states. For a country

like South Africa, it then calls for radical policy developments with definite and clear objectives, backed by enforceable legislative tools. Recommendations are made that economic considerations be prioritized for South Africa at the face of strong policy reforms governing maritime space in South Africa and MSP should be the starting block propelling the country towards a broader maritime economic outlook. As indicated in Figure 18 below, certain tradeoffs and environmental costs will be incurred before an optimum stage of economic growth is reached where the environmental degradation begins to abate.

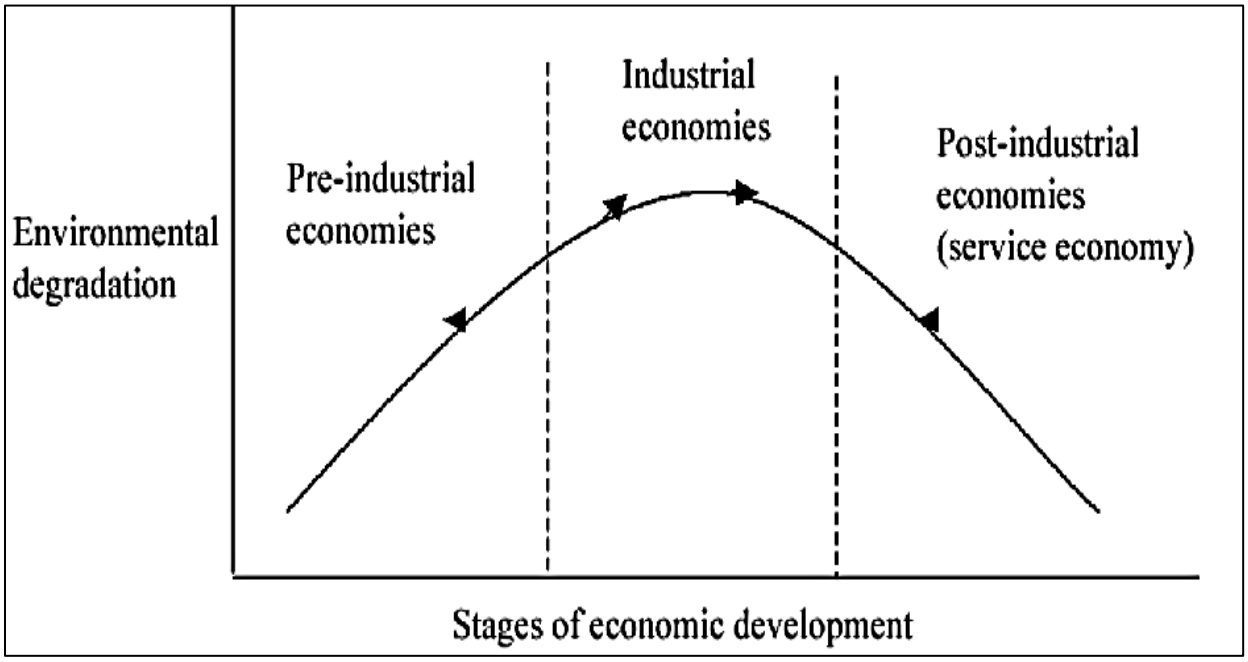

Figure 18: The Environmental Kuznets Curve indicating stages of economic growth with respect to environmental degradation. Source: Panayotou (2003).

From the diagram above, it is clear that optimum economic benefits are achievable against the best compromise of environmental degradation. However, the transition from bad to good environmental condition is not only a factor of good economic growth of the country alone. There need to be good policy response measures in place to be enacted once the optimum economic stage is reached. It should also be in the best interest of the country to observe patience as the time period to reverse all the environmental degradation might be longer than it took to damage the environment. With the post industrial economy stage, monetary subsidies or incentives framework must be annexed into policies for those maritime space users complying with environmental protection and quality measures. This will allow investors in maritime space

to invest more, impacting positively on the country's economy whilst maintaining the integrity of the environment. MSP is seen a good tool for space allocations to different maritime use sectors whilst observing the laws as provisioned by the State.

8.2. The Health Scorecard of the Existing Legal Frameworks

Whereas inference is made to the highest or supreme law of the country, the Constitution Act 108 of 1996 (Republic of South Africa, 1996); which states in terms of Section 24 that everyone has the right to:

a) "*An environment that is not harmful to their health or well-being; and*
b) *Have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."*

Maritime Spatial Planning has evolved to be a fundamental tool requisite towards achieving these demanding virtues. We can highlight however, that a scant view towards optimum economic development in South Africa is apparent from the Constitution as indicated from the abstract above. It can be argued that the usage of the phrase "*justifiable economic and social development"* gives the impression that these two sustainability pillars are being overlooked, hence advocating for passive, conservative, reactionary and intransigent policy provisions towards economic growth of the country. Therefore, emanating from the EKC analysis above; an emergence of economic prioritization in all spheres of government within South African policies and laws are recommended with clear objectives which calls for better than justifiable returns.

In terms of environmental legislature, South Africa has enacted several laws that govern protection and conservation of natural resources whilst satisfying the call for a sustainable future. Most of these tools as provided by the Constitution were enacted post 1994 which marked an important reform in the country politically. As a result, several of these laws came into

promulgation as they rescinded those in the pre-1994 regime. Invoking these facts, it can be argued that environmental legislation in South Africa is not in an unhealthy state. Currently, South Africa has ratified several international tools and has secured many other bilateral, trilateral and multilateral agreements such as the BRICS initiative. These organs make it possible for South Africa to domesticate some of the international environmental laws (Taljaard and van Niekerk, 2013; Harris, 2012; and Glazewski, 1999).

With MSP however being a new and developing tool for improved maritime management, compliance and monitoring; it was not unanticipated that South Africa would have not yet developed an official framework to that effect. However, the recent NEMO White Paper gazette (DEA, 2014) makes strides towards MSP development in South Africa. Following the Germany MSP initiative, it is recommended that MSP development in South Africa provides for economic growth as a priority if it were to realize the NDP 2030 visions. The European Union has to this effect recently passed a law which gives directives to member States to develop MSP taking into considerations environmental, economic and social aspects as minimum requirements (European Union, 2014). From the Chinese model, a compliance method similar to the famous "polluter pays" was adopted which mandates private maritime space users to lease or rent any usage of the sea space. South Africa being a member of the BRICS, some lesson on how the Chinese managed to reverse their almost depleted ecosystem into a manageable environmental notwithstanding the challenges they face with over population, heavy volumes of maritime traffic and generally the busiest ocean region in the world.

It is recommended that for South Africa to best benefit from the natural resources within their EEZ and meet the targets as set in the NDP 2030 vision, business unusual mechanisms in the form of policy guidelines need to be developed. These policies are to be based on self-executing or enforceable domestic laws. Currently, with the environmental laws health card not being anywhere near the Intensive Care Unit (ICU), South Africa can afford to progressively develop these laws and phase or implement them accordingly without relaxing the current legislative regime. Whereas developing an MSP supporting framework that is pro-economic growth, it is recommended that these radical reforms must also promote the economic goals of the country. Adequate considerations should be given to current regime tools such as the ICM Act and other

NEMA Acts. Policies which promote fostering synergized and coordinated maximization of sustainable development, development of the economy, and social beneficiation of all stakeholders is recommended. These frameworks shall give provision and allow for future development and utilization of offshore renewable energy resources; provide for future and increased demand for maritime transport, ports and harbors; fisheries and aquaculture farming; exploitation of offshore oil and gas; submarine cables and pipelines for communication and energy supply.

8.3. Strategic Importance of Maritime Spatial Planning and Maritime Governance in South Africa

South Africa's total Exclusive Economic Zone (EEZ) area is bigger than its adjacent continental land area at 1.535 538 and 1.219 912 km^2 respectively. This after South Africa was accorded sovereign rights over the Prince Edward Islands in the Southern Ocean. It then calls for stringent governance measures to manage resources within the EEZ and all current and future activities. In this section we underscore some of the best fit management mechanisms and strategies to maximize resources utilization towards economic growth of the country without becoming an Achilles' heel to other users from other sectors.

8.3.1. Integration, Cooperation, and Coordination

The maritime space and the ocean at large has remained a dynamic medium believed to be driving the earth's climatic behavior, however; it is yet to be understood and be fully explored. For a country like South Africa with shortage of skills especially in the scientific disciplines, investments towards educational awareness should be employed focusing on long-term returns. Policies which assume the interrelations of the maritime space from different users' point of view are needed. These will call for different users to cooperate towards better management of the maritime environment. Understanding that there is a need for different ocean users to protect the oceans holistically for their individual interest and future investment must be highlighted to all stakeholders.

For better integration, cooperation and coordination; stakeholders or users must be made aware that the inter-operability of the oceans does not qualify rapid results but there are mutual benefits to be shared in the medium to long term period. Recommendations are made that future policies must be indicative of the opportunities exploitable from some of the maritime space use interdependencies. Although, MSP tries to arrest and allocate maritime space use in a sustainable manner benefiting all users and maintaining the environment integrity, there will be challenges which call for strong integration, cooperation and coordination of all stakeholders.

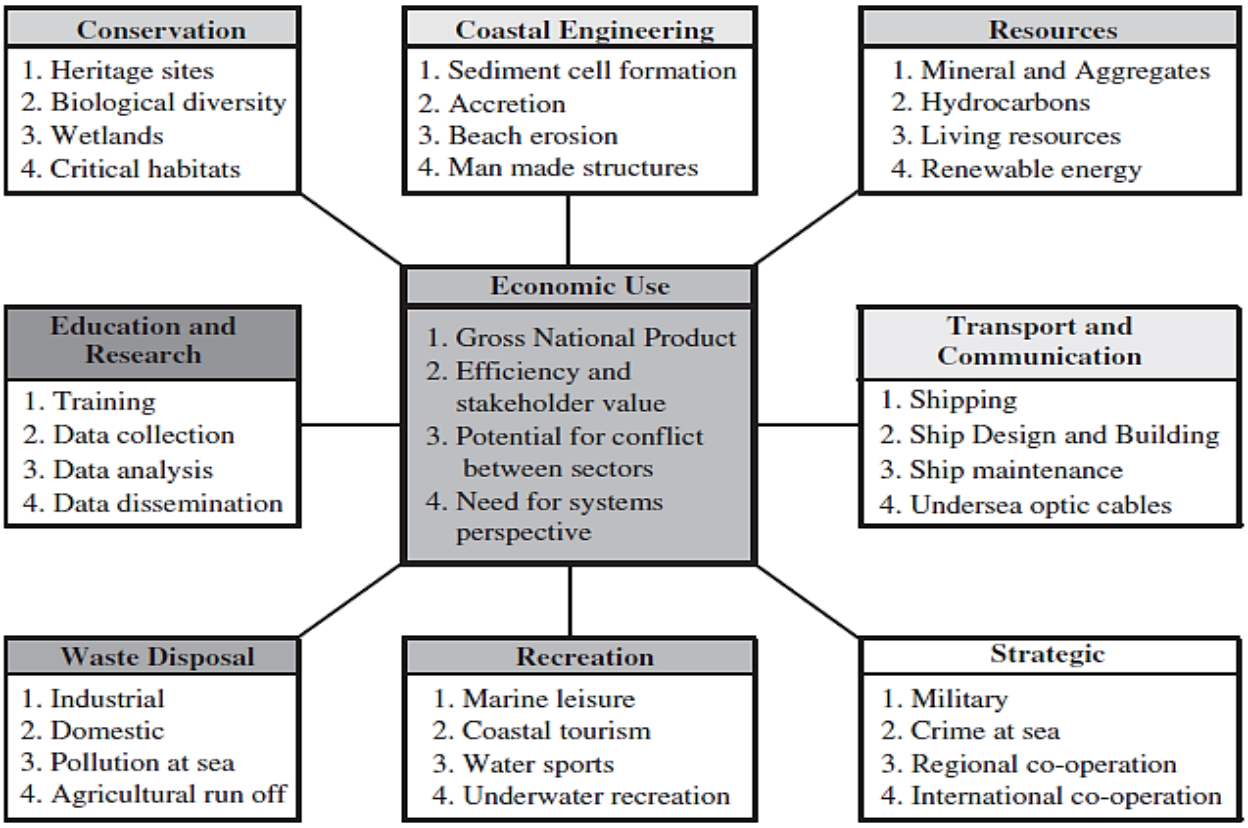

Figure 19: Activities within the maritime space, indicator for need to collaborate, integrate and cooperate towards Economic growth of the country. Source: Gupta (2010).

As seen from Figure 19 above, economic use and its components forms the central focus of the MSP development process whilst calling for the integration, coordination and cooperation with other initiatives such as conservation, coastal geo-engineering, resource management, education and research, transport and communication, waste disposal, recreation, and strategic development. Understanding these interdependencies gives an opportunity for multiple sectors

connectedness; a trait to be achieved if all interested parties are willing to work together. This will prompt maritime space users to collectively fight any force likely to hamper their business interest within the maritime domain. Similar to MSP development, recommendations are made that; the policy to be drawn shall have economic development and growth of the country as their focal point. As indicated in the figure above, strong sectorial integration emanating from institutional coordination is fundamental towards development of an MSP initiative with support from all role players for its sustainability and that of the maritime environment.

8.3.2. Strengthening of private-public partnerships

Commenting on the lack of skill base in South Africa, especially in the public sector; Azar Jammine (Econometrix Economist) said:

"*there is a need for improved cooperation between public and private sector desperately, particularly for public sector's recognition that private sector has a higher proportion of skills and that it is only through the combination of these two that progress can be made"*, writes Peacock (2014).

There is a serious shortage of skilled labor in South Africa and with the financial muscles that private sectors have, they are able to attract most of the top performing graduates directly from the institutions of higher learning. Consequently, very few qualified graduates at the lower performance rank are then left for public enterprises to secure them. Policies development that focuses on improving educational output and delivery in the country are recommended. With the world leaning towards renewable energy, especially offshore wind power; engineering expertise is proving to be crucial for infrastructure development within the maritime domain. For better implementation and compliance to MSP recommendations in the country, highly technical skills will be required. It is a bittersweet outlook in South Africa as most of the skilled work force belongs to the private sectors. Therefore, a joint effort towards betterment of the country between the private and public sectors is required; whilst policies to produce more skilled graduates are being implemented.

The cost of not utilizing the Private-Public Partnership (PPP) in South Africa surpasses that of government agencies working in isolation. Due to the depleted skill pool within public enterprises; budgets overrun as projects takes more time to complete than anticipated are a common feature. Consequently, the responsibility is then put on taxpayers to rescue the financial deficit conjured by these improper executions of plans. Whereas, PPP comes in at a price; it improves on projects delivery timeously whilst utilizing the private sector's model of cost-effective design and construction. With such integration, PPP also benefit the public skills pool through on the job skills and capacity development. We then recommend that policies be developed promoting PPP frontiers for accelerated infrastructure development in the short to medium term, whilst educational outputs are improved within the scarce skill domains such as Maritime Education and Engineering for long term outputs.

Chapter 9

Conclusion

The concept of Maritime Spatial Planning is introduced with an aim to establish its applicability within the domains of the South African territorial waters. It has been globally accepted as a management tool which arrests maritime space use and user conflict whilst enabling frontiers for integrated, cooperative and collaborative management. Recent global trends indicate that increased pressures are expected to intensify as new technological advances are made to explore and unlock natural maritime resources. These together with other global phenomenon such as exponential population growth, coastalization and pressures from climate change are increasing the demand for maritime space and use. Consequent to these stressors, demand for fish as a source of protein (food security) and other sources of energy are predicted to be depleting and migrating away from heavily human active coastal areas as they seek to adapt from these humanly induced climate variability. The demand for offshore oil and gas exploration, renewable energy, shipping transport, conservation of natural biodiversity, military use of ocean space and many others are to reconcile with each other on how best they can benefit from such a vast but highly unpredictable medium, the ocean.

As MSP aims to reconcile current conflicting activities, it is also a planning tool for future uncertainties in relation to climate change. That can be achieved by putting measures to prevent deceitful activities which are detrimental towards sustainable development. In this study, a look at South African legal frameworks to assess if a need for new laws exists was explored. Although, South Africa has strong legislative foundation towards environmental management; it

was found that most of the laws tends to have a needle eye view on broader sustainability aspect as they don't promote harmonization and balance between economic, social and environmental issues. As a cure to that, it is recommended that MSP aimed at sustaining and improving economic appreciation of the maritime domain be developed in South Africa based on models such as that in Germany. It is also recommended that for South Africa to fully explore the benefits maritime space provides whilst growing its economy, not only for short term job creations; strong policies and strategies supported by implementation capacity at operational levels are a requisite. A recommended solution is long term planning and investment on improving the scientific skill base and exceptional educational outputs.

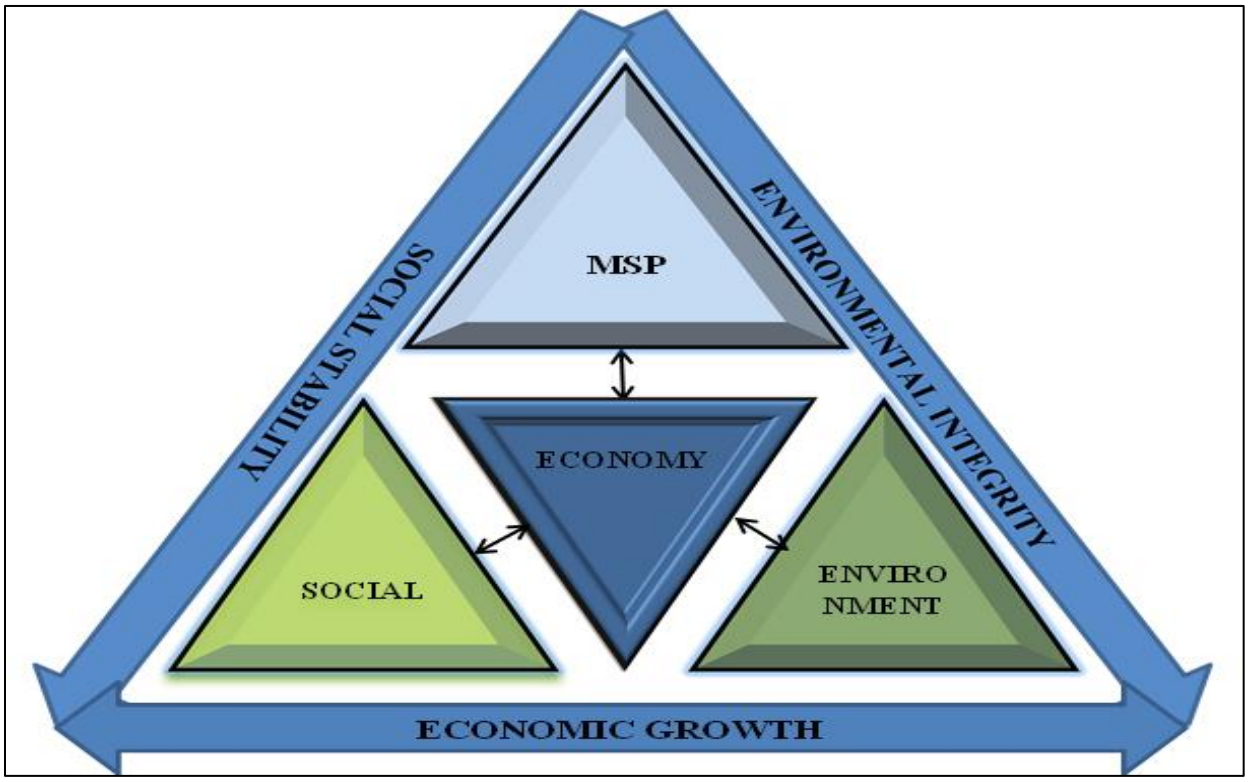

Figure 20: A recommended framework for South African maritime spatial planning initiative with its foundation on "Economic Growth" on the outer shell, whilst the "Economy" being the focal point for MSP development's small scale initiative. Source: Author.

About 90% of global trade in volume is believed to be transported through shipping, thus; it is important to develop plans that enable conservation and protection of maritime environment. The efficiency of global trade thrives on a healthy maritime environment. South African trade with international markets is also dependent on maritime space. Approximately 27.3% of exported

goods are through shipping and about 28% of imported goods enter the country through the maritime ports along the South African coast. Politically, maritime space also helps in enforcing multilateral international relations within the region and the rest of the world at large. Thus, MSP development is not only important for conserving the maritime environment but is crucial for economic development and growth of the country through enhanced international trade agreements with other foreign countries.

Figure 20 above shows a pyramidal scheme of how the three pillars of sustainability should relate. The outer pyramid indicates that economic growth should be the base of all other pillars. The arrows on both the social stability and environmental integrity points downwards indicating that economic growth strives on their strength. The inside pyramid shows the interaction between the three elements believed to be key for the economic sustainability of the country. The economy of the country is seen as central for the well-being of both the environment and social practices. However, MSP is the only mechanism that can enable these multi-sectoral mutual relations. Analysis of data collected through a survey was conducted as part of the study, where understanding of where South Africa is in terms of MSP development. Unsurprisingly, there is a general contented understanding that MSP development in South Africa is somewhat long overdue. The Department of Environmental Affairs (DEA) is seen as a suitable home for such initiative as they already have started developing other projects which may eventually feed into the broader MSP initiative. With other governmental departments having interest within the maritime space, it is expected that high level understanding between these organs of State will be made to eliminate any form of competition from within. Other stakeholders such as research institutes, universities, private companies, governmental agencies, coastal municipalities, general communities and many others shall be consulted and be brought on-board for smooth and progressive process.

Although costs will be incurred during the planning phase and towards implantation of MSP in South Africa, the long term benefits outweigh those of not implementing it. Few compromises might have to be put across board with few sensitive decisions be made. As South Africa aims to fulfill its pre-destined objectives as provided in the NDP 2030 vision, a business unusual approach needs to be put across board. Therefore, there is a need for radical changes in policies

that are pre NDP 2030 vision, and be phased out by new economic based policies which are conscious of the natural resources South African maritime space provides and strives to make South Africa a maritime economic country. These policies must talk to the goals as stipulated in the NDP 2030 vision. Development of MSP is then seen as an initial stage towards achieving those goals as it gives provision for exploring and exploiting resources in an orderly sustainable manner whilst maintaining the integrity of the maritime environment.

This study has achieved its objectives in that, familiarization with the rapidly developing concept of Maritime Spatial Planning and how it can best be practiced in South Africa was discussed in details. Current and future opportunities presented through the development and implementation of MSP with regards to policy recourse was analyzed, with greater emphasis on improving the economic outlook as driven by maritime activities in the country. It is strongly believed that development of MSP will not only help improve the imbalances between economic and environmental agendas but will also highlight the need for improved policies towards high education and increased technical skills pool in the country, a key for sustainable economic growth.

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Appendices

Appendix A: Online Survey Questionnaire

Maritime Spatial Planning (MSP) in South Africa: A nexus between Legal, Economic, Social and Environmental Agendas.

Aluwani Elijah Ramulifho is a Masters Student at the World Maritime University in Sweden. His research undertaking looks at establishing the Legal foundation for MSP development in RSA and future demand for Maritime Space use. It aims at evaluating the importance of Maritime Environment as a medium for Economic Development and addresses the non-linear but inverse relation between the Environment and the Economic growth of the country. It also aims to analyze current policy frameworks in comparison with other global front runners with respect to MSP development, its benefits and opportunities to amend or develop new Ocean Governance regimes.

Mr. Ramulifho has an MSc in Applied Marine Science from the University of Cape Town, BSc HONS (Meteorology - University of Pretoria) and BSc in Mathematics & Physics (University of Venda). He served the Department of Environmental Affairs' Ocean and Coasts Branch before opting to follow his dreams towards acquiring an International Qualification.

He can be contacted via elijah.ramulifho@gmail.com (Gmail) or Aluwani Elijah (LinkedIn) for inquiries and clarifications.

1. Is MSP development a requirement in SA?

- Yes
- No
- Maybe

2. How will MSP help the Maritime Industry in SA?

- Improve the Industry.
- Impair the Industry.

3. Is the stakeholders engagement important for this cause?

- Definitely
- Most definitely
- Maybe
- Not at all

4. Which stakeholders (organisations) are important for this cause?

Please list names of organizations below:

5. What role must the government play in the process of MSP development?

- Leading role
- Facilitation role

6. Which government department (if leading role) must take responsibility?

Give the name of the department below and a short description in support of your choice.

7. Do you think there is a need for new central and focused Maritime Affairs Ministry in South Africa?

Currently, several departments perform and manage activities within the Maritime Space resulting in delayed/prolonged dialogues and decision making.

- Yes
- No

8. What economic implications will this process bring upon SA?

- Benefit the economy
- Repress the economy
- No impact at all

9. Are there legal provisions for the development of MSP in South Africa?

- Yes
- No
- Not adequate

10. Are there any conflicting need for Maritime Space use in South Africa?

- Yes
- No

11. If yes, which are the conflicting activities within South African maritime space?
Please, elaborate by giving examples to your answer above.

12. Do you foresee MSP helping resolve such conflicts?

- Yes
- No

13. If "No" to Question 10 above, do you foresee any possible conflicts in maritime space use?

- Yes
- No

14. If yes, which conflicting activities do you foresee competing for maritime space use in the future?
Please, elaborate by giving examples to your answer above.

15. MSP is a tool for?

- Economic development and environmental planning & management
- Ecosystem-based management (ecological & biological sensitive areas)

16. Does South Africa have scientific capacity to develop MSP?

- Yes
- No

17. If not, what are the discipline (skills) to be improved?
List and elaborate.

18. Which legal regime must be applied to MSP?

- Enforceable
- Non-binding

19. On a scale of 1-5 (with 1 being not important and 5 most important), do you think MSP is important for SA?

Tick one box.

- 1
- 2
- 3
- 4
- 5

20. Do you think MSP will encourage cooperative and collaborative governance?

- Yes
- No

21. Will MSP improve coastal environment protection and health?

- Yes
- No

22. Will MSP improve coastal industrialization development and planning in SA?

- Yes
- No

23. Do you think there is Political Acceptance (Political Will) and acknowledgement towards development of MSP?

- Yes
- No

24. What are your expected outcomes from the development of MSP in South Africa?

25. Thank you for your participation, please feel free to leave your comments and advises below.

Submit

100%: You made it.

Never submit passwords through Google Forms.

Appendix B: Online Survey Responses

1. Is MSP development a requirement in SA?	2. How will MSP help the Maritime Industry in SA?	3. Is the stakeholders' engagement important for this cause?	4. Which stakeholders (organizations) are important for this cause?	5. What role must the government play in the process of MSP development?
Yes	Improve the Industry.	Definitely	DAFF, DEA, DME, Dept of Transport, SANBI, Private mining companies, oil and gas companies (e.g., Shell, BP... whoever has applied for prospecting rights), Universities doing coastal and marine research, CSIR, other private companies involved in ecotourism (e.g., whale watching, shark-cage diving, etc), mariculture, etc.	Facilitation role
	Improve the Industry.	Most definitely	Cape nature CAPE program Public Participation Masifundise Sancor Coastal Links Environmental Evaluation Unit UCT	Facilitation role
Yes	Improve the Industry.	Definitely	SAMSA, government, Port Authority, fishing industry, shipping lines, Navy	Leading role
Yes	Improve the Industry.	Most definitely	Dept of Energy Dept of Transport Oil and Gas industries Oil and Gas regulators De Beers Mining (marine) National Ports Authority CSIR SAIIB Maritime Industry Fisheries (DAFF) NGO sector (WWF) KZN Wild Life Natal Sharks Board	Leading role
Yes	Improve the Industry.	Most definitely	business environmental transport recreation	Facilitation role
Yes	Improve the Industry.	Most definitely	DEA, DAFF, SANBI, Universities, Marine Environmental Consultants, NGOs, etc.	Leading role
Yes	Improve the Industry.	Maybe	All organs of State linked to conservation, environmental management or marine science and biology.	Leading role

Maybe	Improve the Industry.	Most definitely	Department of Environmental Affairs: Oceans and Coast	Leading role
No	Improve the Industry.	Definitely	Employees, Communities living around the port, Unions, Lobby Groups, Local Municipalities, Provincial Government, PCC's.	Facilitation role
Maybe	Improve the Industry.	Most definitely	Goverment and Maritime Industry	Leading role
Yes	Improve the Industry.	Most definitely	Government (Various departments Dot, Roads and Industry, Treasury, Town and Regional planning, Rural Development and land reform and municipalities) Government agencies managing Harbours, Airports, Rail networks,Roads, borders Unions for worker representation and change management Private sector in Shipping industry, freight/cargo handlers, intermodal connectivity owners, supply chain goods production and manufacturing	Leading role
Maybe	Improve the Industry.	Most definitely	SAMSA, Department of Environmental Affairs, Department of Energy.	Leading role
Yes	Improve the Industry.	Definitely	Transnet, Department of Environmental Affairs, Department dealing with Fisheries, Department of Transport, Department of Minerals and Energy, Department of public Enterprise, Security cluster, Coastal Municipalities, Local Coastal community organisation, Coastal business people.	Leading role
Yes	Improve the Industry.	Definitely	Government and Market Players	Leading role
No	Improve the Industry.	Most definitely	Government - DEA, Trade and Industry, Municipalities, DMR, Energy, Fisheries etc, NGO's - as may be applicable to each area Industry - Chamber of commerce, Ports Authority, IDZ's, Private Companies etc, Community - as may be applicable to each area	Facilitation role
Yes	Improve the Industry.	Most definitely	1. Government (National, Provincial and Local) e.g. DAFF and Environmental Affairs and Relevant division(s) within the Municipality. 2. Civil Society Organisations, (Risks and Opportunities) and 3. Fishing Industry Association(s), (Risks and Opportunities).	Leading role
Yes	Improve the Industry.	Most definitely	Maritime Communities (fisheries, shipping etc) Academia and Research Councils	Facilitation role

			Transnet Government departments (Environment, Defence, Fisheries, Transport, Trade and Industry / Public Enterprise)	
Yes	Improve the Industry.	Definitely	All provincial environmental authorities SANBI DEPT ENV AFFAIRS AND TOURISM DEPT MINERAL AFFAIRS SANDF NAVY DEPT TRADE AND INDUSTRY	Leading role
Yes	Improve the Industry.	Definitely	Members that could be considered for inclusion in this group: • National departments with a mandate for marine matters, or operate in this field, e.g.: o Department of Agriculture, Forestry and Fisheries; o Department of Defence; o Department of Economic Development; o Department of Energy; o Department of Land Affairs - Surveys and Mapping; o Department of Mineral Resources; o Department of Public Enterprises; o Department of Public Works; o Department of Rural Development and Land Reform; o Department of Science and Technology; o Department of Tourism; o Department of Trade and Industry; o Department of Transport; o Department of Water Affairs; • Provincial Lead Agencies for Coastal Management; • Conservation Authorities: o CapeNature; o Eastern Cape Parks Authority; o Ezemvelo KZN Wildlife; o iSimangaliso Wetland Park Authority; o Northern Cape Department of Environment and Nature Conservation; o South African National Parks, • Para-Statal Authorities: o Council for Geoscience; o Council for Scientific and Industrial Research (CSIR); o ESKOM; o National Nuclear Regulator; o PetroSA; o South African Data Centre for Oceanography (SADCO); o South African Environmental Observations Network (SAEON); o South African Heritage Resources	Leading role

			Agency (SAHRA); o South African Institute for Aquatic Biodiversity (SAIAB); o South African Maritime Safety Authority (SAMSA); o South African National Biodiversity Institute (SANBI); o South African National Ports Authority / Transnet; and o South African Weather Service (SAWS).	

6. Which government department (if leading role) must take responsibility?	**7. Do you think there is a need for new central and focused Maritime Affairs Ministry in South Africa?**	**8. What economic implications will this process bring upon SA?**	**9. Are there legal provisions for the development of MSP in South Africa?**	**10. Are there any conflicting need for Maritime Space use in South Africa?**	**11. If yes, which are the conflicting activities within South African maritime space?**
I think it should be a collaborative effort with full stakeholder engagement, lead by one of the Universities to have an independent and objective leadership. If government took the role it would have to be a shared lead responsibility to avoid one sector's priorities getting prioritized over another's.	No	Benefit the economy	Yes	Yes	If I understand correctly, the question is asking what the conflicting activities are in the SA marine space. Number 1: Mining vs Biodiversity/Conservation. Other competing sectors include transport, ecotourism, mariculture, fisheries [conflicts are considered beyond the surf zone only, and does not extend into intertidal/surf zone activities e.g., recreation)
National Department of Oceans and Coast DEADP Oceans and coastal Management DAFF Department of Forestry and Fishing	Yes	Benefit the economy	Not adequate	Yes	It depends on your local Industries that they are not cut out the market and their needs are met before international needs in our waters

There should be joint stakeholder engagement to share responsibilities so the Onus is not on one department totally. If it is one Department there must be more clarity in the Laws and their Mandate					
Owing to the fact that SA has a approx. 3400km of coast line, ideally a maritime ministry should be created to allow for quick response, flexibility and development of a maritime nation.	Yes	Benefit the economy	Not adequate	No	
Department of Environmental Affairs: Branch Oceans and Coasts	Yes	Benefit the economy	Not adequate	Yes	
OLD MCM department - they have the most knowledge	Yes	Benefit the economy	Not adequate	Yes	Aquaculture saldanha bay transport and business
DEA (including SANBI) and DAFF Together, these departments are responsible for marine management, so they should lead in developing this important tool.	Yes	Benefit the economy	Yes	Yes	Exploitation of marine resources (mining, fishing, industrial use) versus protection of the environment and ecosystem services.
DEA, Oceans and Coasts - have the scientific and admin capacity.	Yes	Benefit the economy	Not adequate	Yes	Conservation (and eco-tourism) mining, prospecting and fisheries all compete for some of the same areas.
Department of Environmental Affairs: Oceans and Coast	No	No impact at all	Not adequate	Yes	Ports / Harbours and Recreational activites
Department of	Yes	Benefit the	Not adequate	Yes	Example Aquaculture and

Environmental Affairs.		economy			the proximity of the port are in conflict with possible constuction and the impact on the aquaculture activities.
Public enterprise	Yes	Benefit the economy	Not adequate	No	
Department of Town and Regional Planning together with the Department of Transport - The first department (as taken from their official website) looks at rectification of the spatial and other imbalances in both urban and rural areas, as well as the improvement of inefficient and underperforming living environments. The challenge for planning lies in the fact that different interests and expectations for the future are often contradictory and conflict-ridden. A professional approach that combines sensitivity and analytical and strategic skills is hence required to handle the various political, social, spatial, environmental and economic issues at stake.	Yes	Benefit the economy	Not adequate	Yes	Currently most globally Major world players have very active maritime economies in their countries for job creation, import and export controls, export of finished goods,etc. In South Africa it appears ad though the maritime industry is a hindrance to those with the need for developing port land into luxury apartments for the wealthy and also a great focus on our ports as points of tourism only. e.g. Cape town waterfront area, Durban harbour port tourism activities
SAMSA - my view is that this role should be spearheaded by SAMSA together with skills from DEAT as SAMSA	Yes	Benefit the economy	Yes	Yes	Marine environment preservation versus economic development through mineral exploration on the sea bed. Expansion of ports versus preservation of surrounding

has a direct interest in "maritime affairs" whereas DEAT is tasked with landbased environmental issues as well. SAMSA can focus their resources solely towards the marine environment instead of DEAT having to "share the cake" amongst its many responsibilities.					marine environment.
Department of Environmental Affairs- Their mandate is to preserve and protect the marine environment. They already have areas within the coast that they have declared as MPAs. In all the activities within the coast an environmental protection is the most important factor. This department will be able to ensure the marine environment is safe guided during the whole process.	Yes	Benefit the economy	Yes	No	
DOT	Yes	Benefit the economy	Not adequate	No	
DEA - the ministry has existing experience of maritime activities through Oceans and coasts unit	Yes	Benefit the economy	No	No	
DAFF (Fisheries) and Environmental Affairs	Yes	Benefit the economy	Not adequate	No	

An Independent Entity, accountable to the Republic should be established to lead this development.	Yes	Benefit the economy		No	
Sanbi. They are already leaders in ENV mange mentioned and planning with the aim of encouraging sustainable development	Yes	Benefit the economy	Not adequate	Yes	Mining, fisheries and environment. These can result in competing sea use pressure's which are incompatible
12. Do you foresee MSP helping resolve such conflicts?	**13. If "No" to Question 10 above, do you foresee any possible conflicts in maritime space use?**	**14. If yes, which conflicting activities do you foresee competing for maritime space use in the future?**	**15. MSP is a tool for?**	**16. Does South Africa have scientific capacity to develop MSP?**	**17. If not, what are the disciplines (skills) to be improved?**
Yes		Possibly green energy initiatives (e.g., offshore wind farms)	Economic development and environmental planning & management	Yes	
Yes		Poaching from an international level and monitoring of that space	Economic development and environmental planning & management		
			Economic development and environmental planning & management	Yes	
Yes			Economic development and environmental planning & management	Yes	
Yes		Aquaculture	Ecosystem-based	Yes	

		recreaction	management (ecological & biological sensitive areas)		
Yes		Mining, fishing, aquaculture, industries, pollution, conservation areas (MPAs), recreational areas, etc.	Economic development and environmental planning & management	Yes	
No		Same as for question 11.	Ecosystem-based management (ecological & biological sensitive areas)	Yes	We have the skills, unfortunately many of the people with the skills are not employed by government departments and contracting consultants makes the process more costly.
Yes		Ports / Harbours and Recreational activites	Ecosystem-based management (ecological & biological sensitive areas)	Yes	
Yes	Yes		Economic development and environmental planning & management	No	Safety Health and Environment Skills; Port Planning Skills
	No		Economic development and environmental planning & management	No	
Yes		With the reality of global warming more space will be required for maritime activities as the water levels are rising and claiming land. This could be a major conflict area between government and the private sector if it's not rectified early enough before	Economic development and environmental planning & management	No	Greater investment in research.i.e. CSIR,equiping institutions of higher learning to adapt curricula accordingly in the areas of required expertise. Benchmarking internationally with BRICS nations and major players. Policy development.

		too much urban investment. We are already following the Netherlands example of claiming sea area for port development as they have run out of space decades ago. Is it truly necessary to plan building a port between Robben Island and Cape town through reclamation?			
Yes			Economic development and environmental planning & management	Yes	If not, then we should reach out to our African partners or BRICS partners, alternatively, develop this area and invest in the technology and human resources.
	Yes	South Africa has began exploring for oil and if reserves are found that will mean certain areas will be designated as oil blocks. Fisheries and shipping routes might be affected	Economic development and environmental planning & management	Yes	
Yes			Economic development and environmental planning & management	No	Maritime supply chain Technical and Engineering Maritime skills
	Yes	Conservation and Tourism v/s developments especially oil industry activities	Economic development and environmental planning & management	Yes	

	No		Economic development and environmental planning & management	Yes	
	No		Economic development and environmental planning & management	Yes	
Yes		Fisheries, Mining and Environment	Economic development and environmental planning & management	Yes	

18. Which legal regime must be applied to MSP?	**19. On a scale of 1-5 (with 1 being not important and 5 most important), do you think MSP is important for SA?**	**20. Do you think MSP will encourage cooperative and collaborative governance?**	**21. Will MSP improve coastal environment protection and health?**	**22. Will MSP improve coastal industrialization development and planning in SA?**	**23. Do you think there is Political Acceptance (Political Will) and acknowledgement towards development of MSP?**	**24. What are your expected outcomes from the development of MSP in South Africa?**	**25. Thank you for your participation, please feel free to leave your comments and advises below.**
Enforceable	5	Yes	Yes	Yes	Yes	There is lots of evidence in the scientific literature that marine spatial planning and systematic conservation/ biodiversity planning can	Q7. I am concerned that the subtext in question 7 is biasing people to respond "yes". I said "no" because then we would have DAFF, DEA and Maritime Affairs involved in decision-making in the marine environment. I think it would add to the problems rather than solving them. Q21-22 = yes, only if biodiversity/conservation planning is

						minimize losses and generate synergistic gains - financially and ecologically. E.g.: White, C., Halpern, B.S. & Kappel, C.V. (2012) Ecosystem service tradeoff analysis reveals the value of marine spatial planning for multiple ocean uses. Proceedings of the National Academy of Sciences, 109, 4696-4701. Klein, C.J., Steinback, C., Watts, M., Scholz, A.J. & Possingham, H.P. (2009) Spatial marine zoning for fisheries and conservation. Frontiers in Ecology and the Environment, 8, 349-353. I believe that proper, co-ordinated, integrated, well-planned MSP that fundamentall	included as part of the MSP process... define "coastal"...? I consider "the coast" to be dunes to the nearshore, but some others consider "the coast" to extend to the EEZ. See this reference for a mix of conservation planning and marine spatial planning for the South African sandy shores: http://connect.nmmu.ac.za/Members/lharris.aspx?page=mypages&view=Theses Note also the SANBI website (http://bgis.sanbi.org) for access to the National Estuary Biodiversity Plan and the Fresh Water Ecosystem Priority Areas, as well as the Provincial Biodiversity Plans, which may be relevant as background to South Africa's other spatial prioritization programmes (and successes in that field). Good luck with the MSc. I think this is super valuable work - I look forward to the outputs.

						y protects the integrity of natural systems (ecological processes and biodiversity) but also allows for access to goods and services across all stakeholders will require negotiation but is achievable in South Africa. Further, its is the only way forward for truly sustainable development. If this is followed, we can protect our invaluable national assets (natural capital - biodiversity, etc), enhance the economy (see the White et al 2012 paper) and thereby facilitate achieving social goals through job creation, food security, and maintaining healthy ecosystems to support human health and well-being.	
Enforceable	5	Yes	Yes	Yes	Yes	Management of our Water	This is a great initiative and due to lack of MSP internationally so many seas are not

						Management of trawling Management of logo marine protected areas	monitored for the trawling and fishing. My email details are …. I sit on the Olifants Estuary Management Forum where just doing coastal spatial planning is a difficult task.
Enforceable	5	Yes		Yes	Yes	It is an opportunity which will allow SA to get the most out the coast line.	
Enforceable	5	Yes	Yes	Yes	Yes	Using the Oceans Policy as a main governing legislature/ framework, MSP will assist with the operation plan on various ways to implement the policy and also manage conflicting needs by various stakeholders	Wishing you the very best with your study.
Enforceable	5	No	No	Yes	No	All talk no action	
Non-binding	4	Yes	Yes	Yes	Yes	Better management of oceans and coasts	
Enforceable	3	No	Yes	No	No	Being able to prioritize areas for conservation and recognition of all the activities that are impacting on our coastal and marine resources.	Please check the spelling and wording of some of your questions. A couple of questions are also quite redundant making the questionnaire confusing.
Enforceable	4	Yes	Yes	Yes	Yes		

Enforceable	5	Yes	Yes	Yes	No	Maritime Economic Zones; Increased job creation	This is a good topic, and long overdue
Enforceable	3	Yes	No		No	Collaboration	I was not able to answer some of the questions based on limited information available and lack of knowledge.
Enforceable	5	Yes	Yes	Yes	Yes	To assist in rectifying past economical, social, environmental, cultural and ecological imbalances.	Regards. Theresa. Please email me a copy of my input. Thank you for this opportunity to participate. Let me know should you have any queries or questions.
Enforceable	4	Yes	Yes	Yes	Yes	Correct planning on use of maritime space through collective dialogue and adequate research. Entrusting this task to persons who are qualified and skilled in this area and forget about political appointments - get the job done!	Great topic and I hope you forward your completed dissertation to those responsible in government for the said issue.
Enforceable	1	Yes	Yes	Yes	Yes		
Non-binding	5	Yes	Yes	Yes	Yes	dynamics in clusters	
Enforceable	5	Yes	Yes	Yes	No	Identify potential marine economic benefits for creating employment opportunities within the maritime sector and ensure	

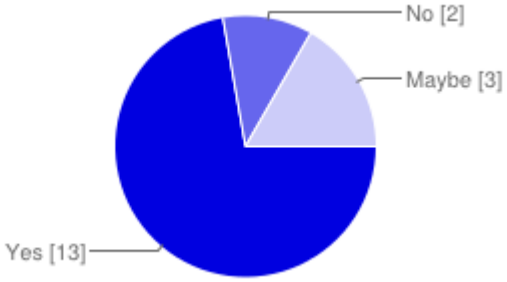
						protection of marine environment.	
Enforceable	5	Yes	Yes	Yes	Yes	Proper and Inclusive marine governance characterized by a participatory approach which involves both industry and civil society stakeholders. This would assist in maximizing benefits while keeping risks low.	None
Enforceable	5	Yes	Yes	Yes	Yes	Investment will be increased leading to job and business opportunities A better coordination within the space Sustainable use of resources for the benefit of future generations	
Enforceable	1	Yes	Yes	Yes	Yes	a spatial development framework with guidelines,regulations and effective sea use 'rights'	
Enforceable	4	Yes	Yes	Yes	Yes	Agreement on the best use of the sea space, effective implementation of the MSP Plan,	1) Related to point 1: MSP is not a legal requirement currently, but is receiving more prominent attention and is now becoming a priority for the DEA. 2) Point 15: should strive for balance between sustainable development and environmental protection 3) Point 7: SA currently considering setting

						good monitoring	up a government coordinating structure for oceans issues - can provide details later as documents currently classified 4) Regarding point 9: Extract from 1 of my documents - if you use this, pse acknowledge me - I can supply reference: There may be different legislative options available to approve the Marine Plan (see Step 1, Task 2, Action 1). Currently, the easiest way appears to be by making use of the existing mechanisms within the ICM Act, especially: • The National Coastal Management Programme (S 44- 45); • Coastal Planning Schemes (S 56 - 57); or • Special Management Areas(S 23 - 24). If the ICM Act is used, the requirements of S 53 of the ICM Act, related to consultation and public participation, will have to be met. This section is produced here for convenience: "53. (1) Before exercising a power, which this Act requires to be exercised in accordance with this section, the Minister, MEC, municipality or other person exercising that power must— (a) consult with all Ministers, MEC's or municipalities whose areas of responsibilities will be affected by the exercise of the powers in accordance with the principles of co-operative governance as set out in Chapter 3 of the Constitution; (b) publish or broadcast his or her intention to do so in a manner that is reasonably likely to bring it to the attention of the public; and (c) by notice in the Gazette— (i) invite members of the public to submit, within no less than 30 days of such notice, written representations or objections to the proposed exercise of power; and (ii) contain sufficient information to enable members of the public to submit representations or objections." In addition to the above legal requirements, it is proposed that the draft Marine Spatial Plan is tabled for discussion at the following existing government structures before it is gazetted for public comment: • WG 8 of MINTECH; • Coastal Committees (National and four Provincial); • MINTECH; • MINMEC; • The Environmental Portfolio Committees (National and Provincial);

							• Cabinet Cluster(s) ; and • Cabinet. Depending on the legal option followed, the final Marine Spatial Plan may have to be gazetted. Ehler and Douvere (2009) point out that as part of this Task , consideration may also have to be given to the following issues, which may take a significant amount of time to address: • "Formal adoption of the spatial management plan, its goals and objectives, rules, and spatial management measures (including zoning plans and regulations, as appropriate); • Approving any new changes in management boundaries, if necessary; • Establishing any new institutional arrangement, e.g., an interagency coordinating council or inter-sectoral coordinating bodies, if proposed; • Approving any new staffing or organizational changes, if necessary; and • Approving the allocation of new funds to implement, monitor and evaluate the marine spatial plan, if proposed."

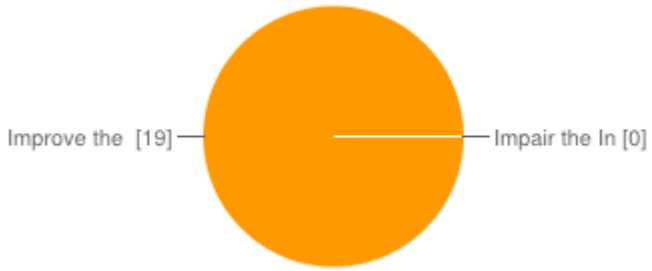
Appendix C: Summary and Analysis of the Survey

1. Is MSP development a requirement in SA?



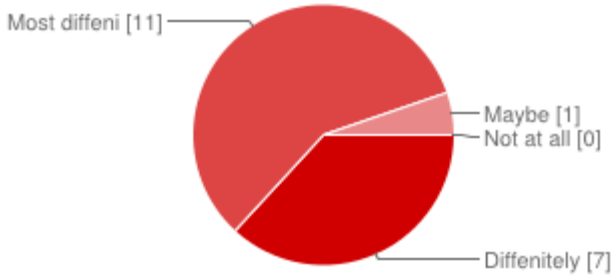
Yes	**13**	65%
No	**2**	10%
Maybe	**3**	15%

2. How will MSP help the Maritime Industry in SA?



Improve the Industry.	**19**	95%
Impair the Industry.	**0**	0%

3. Is the stakeholders' engagement important for this cause?



Definitely	**7**	35%
Most definitely	**11**	55%
Maybe	**1**	5%
Not at all	**0**	0%

4. Which stakeholders (organizations) are important for this cause?

Employees, Communities living around the port, Unions, Lobby Groups, Local Municipalities, Provincial Government, PCC's.

SAMSA, Department of Environmental Affairs, Department of Energy.

Government (Various departments Dot, Roads and Industry, Treasury, Town and Regional planning, Rural Development and land reform and municipalities) Government agencies managing Harbours, Airports, Rail networks,Roads, borders Unions for worker representation and change management Private sector in Shipping industry, freight/cargo handlers, intermodal connectivity owners, supply chain goods production and manufacturing

1. Government (National, Provincial and Local) e.g. DAFF and Environmental Affairs and Relevant division(s) within the Municipality. 2. Civil Society Organisations, (Risks and Opportunities) and 3. Fishing Industry Association(s), (Risks and Opportunities).

Department of Environmental Affairs: Oceans and Coast

All provincial environmental authorities SANBI DEPT ENV AFFAIRS AND TOURISM DEPT MINERAL AFFAIRS SANDF NAVY DEPT TRADE AND INDUSTRY

Members that could be considered for inclusion in this group: • National departments with a mandate for marine matters, or operate in this field, e.g.: o Department of Agriculture, Forestry and Fisheries; o Department of Defence; o Department of Economic Development; o Department of Energy; o Department of Land Affairs - Surveys and Mapping; o Department of Mineral Resources; o Department of Public Enterprises; o Department of Public Works; o Department of Rural Development and Land Reform; o Department of Science and Technology; o Department of Tourism; o Department of Trade and Industry; o Department of Transport; o Department of Water Affairs; • Provincial Lead Agencies for Coastal Management; • Conservation Authorities: o CapeNature; o Eastern Cape Parks Authority; o Ezemvelo KZN Wildlife; o iSimangaliso Wetland Park Authority; o Northern Cape Department of Environment and Nature Conservation; o South African National Parks, • Para-Statal Authorities: o Council for Geoscience; o Council for Scientific and Industrial Research (CSIR); o ESKOM; o National Nuclear Regulator; o PetroSA; o South African Data Centre for Oceanography (SADCO); o South African Environmental Observations Network (SAEON); o South African Heritage Resources Agency (SAHRA); o South African Institute for Aquatic Biodiversity (SAIAB); o South African Maritime Safety Authority (SAMSA); o South African National Biodiversity Institute (SANBI); o South African National Ports Authority / Transnet; and o South African Weather Service (SAWS).

Government - DEA, Trade and Industry, Municipalities, DMR, Energy, Fisheries etc, NGO's - as may be applicable to each area Industry - Chamber of commerce, Ports Authority, IDZ's, Private Companies etc, Community - as may be applicable to each area

Government and Market Players

Cape nature CAPE program Public Participation Masifundise Sancor Coastal Links Environmental Evaluation Unit UCT

Transnet, Department of Environmental Affairs, Department dealing with Fisheries, Department of Transport, Department of Minerals and Energy, Department of public Enterprise, Security cluster, Coastal Municipalities, Local Coastal community organisation, Coastal business people.

DAFF, DEA, DME, Dept of Transport, SANBI, Private mining companies, oil and gas companies (e.g., Shell, BP... whoever has applied for prospecting rights), Universities doing coastal and marine research, CSIR, other private companies involved in ecotourism (e.g., whale watching, shark-cage diving, etc), mariculture, etc.

business environmental transport recreation

Maritime Communities (fisheries, shipping etc) Academia and Research Councils Transnet Government departments (Environment, Defence, Fisheries, Transport, Trade and Industry / Public Enterprise)

DEA, DAFF, SANBI, Universities, Marine Environmental Consultants, NGOs, etc.

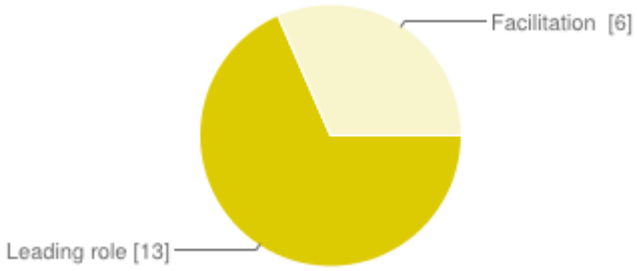
Dept of Energy Dept of Transport Oil and Gas industries Oil and Gas regulators De Beers Mining (marine) National Ports Authority CSIR SAIIB Maritime Industry Fisheries (DAFF) NGO sector (WWF) KZN Wild Life Natal Sharks Board

SAMSA, government, Port Authority, fishing industry, shipping lines, Navy

All organs of state linked to conservation, environmental management or marine science and biology.

Goverment and Maritime Industry

5. What role must the government play in the process of MSP development?



Leading role	**13**	65%
Facilitation role	**6**	30%

6. Which government department (if leading role) must take responsibility?

I think it should be a collaborative effort with full stakeholder engagement, lead by one of the Universities to have an independent and objective leadership. If government took the role it would have to be a shared lead responsibility to avoid one sector's priorities getting prioritized over another's.
DEA - the ministry has existing experience of maritime activities through Oceans and coasts unit
DEA, Oceans and Coasts - have the scientific and admin capacity.
OLD MCM department - they have the most knowledge
Sanbi. They are already leaders in ENV mange mentioned and planning with the aim of encouraging sustainable development
Currently agreed that DEA will fulfil this role - ito the "Oceans Policy" White Paper
SAMSA - my view is that this role should be spearheaded by SAMSA together with skills from DEAT as SAMSA has a direct interest in "maritime affairs" whereas DEAT is tasked with landbased environmental issues as well. SAMSA can focus their resources solely towards the marine environment instead of DEAT having to "share the cake" amongst its many responsibilities.
Department of Environmental Affairs: Branch Oceans and Coasts
Department of Environmental Affairs.
Department of Town and Regional Planning together with the Department of Transport - The first department (as taken from their official website) looks at rectification of the spatial and other imbalances in both urban and rural areas, as well as the improvement of inefficient and underperforming living environments. The challenge for planning lies in the fact that different interests and expectations for the future are often contradictory and conflict-

ridden. A professional approach that combines sensitivity and analytical and strategic skills is hence required to handle the various political, social, spatial, environmental and economic issues at stake.

DEA (including SANBI) and DAFF Together, these departments are responsible for marine management, so they should lead in developing this important tool.

DAFF (Fisheries) and Environmental Affairs

National Department of Oceans and Coast DEADP Oceans and coastal Management DAFF Department of Forestry and Fishing There should be joint stakeholder engagement to share responsibilities so the Onus is not on one department totally. If it is one Department there must be more clarity in the Laws and their Mandate

Department of Environmental Affairs: Oceans and Coast

Department of Environmental Affairs- Their mandate is to preserve and protect the marine environment. They already have areas within the coast that they have declared as MPAs. In all the activities within the coast an environmental protection is the most important factor. This department will be able to ensure the marine environment is safe guided during the whole process.

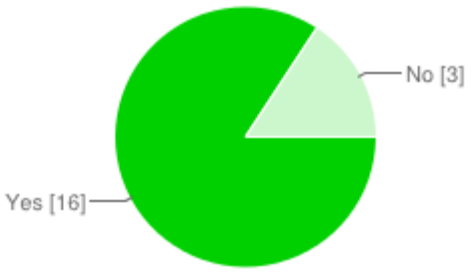
Owing to the fact that SA has a approx. 3400km of coast line, ideally a maritime ministry should be created to allow for quick response, flexibility and development of a maritime nation.

DOT

Public enterprise

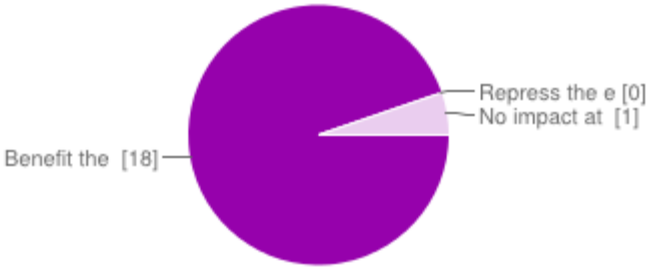
An Independent Entity, accountable to the Republic should be established to lead this development.

7. Do you think there is a need for new central and focused Maritime Affairs Ministry in South Africa?



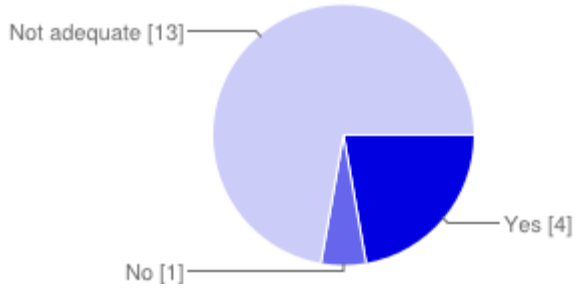
Yes	**16**	80%
No	**3**	15%

8. What economic implications will this process bring upon SA?



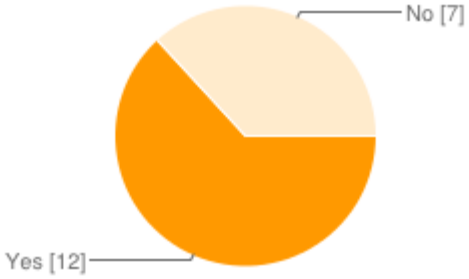
Benefit the economy	**18**	90%
Repress the economy	**0**	0%
No impact at all	**1**	5%

9. Are there legal provisions for the development of MSP in South Africa?



Yes	**4**	20%
No	**1**	5%
Not adequate	**13**	65%

10. Are there any conflicting need for Maritime Space use in South Africa?



Yes	**12**	60%
No	**7**	35%

11. If yes, which are the conflicting activities within South African maritime space?

Marine environment preservation versus economic development through mineral exploration on the sea bed. Expansion of ports versus preservation of surrounding marine environment.

The normal ones: Mining vs fishing vs environment vs tourism vs sub-sea infrastructure vs shipping lanes vs private individuals scenic vistas etc

Ports / Harbours and Recreational activites

Conservation (and eco-tourism) mining, prospecting and fisheries all compete for some of the same areas.

If I understand correctly, the question is asking what the conflicting activities are in the SA marine space. Number 1: Mining vs Biodiversity/Conservation. Other competing sectors include transport, ecotourism, mariculture, fisheries

[conflicts are considered beyond the surf zone only, and does not extend into intertidal/surf zone activities e.g., recreation)

Conservation needs versus the Oil and Gas Explorations Similarly the benthic biodiversity conservation and other marine resources against diamond mining.

It depends on your local Industries that they are not cut out the market and their needs are met before international needs in our waters

Exploitation of marine resources (mining, fishing, industrial use) versus protection of the environment and ecosystem services.

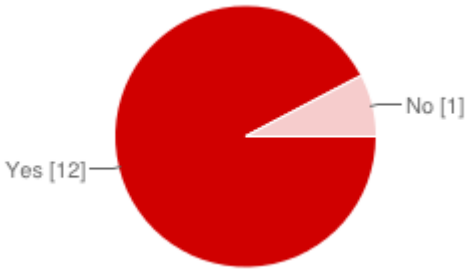
Mining, fisheries and environment. These can result in competing sea use pressure's which are incompatible

Currently most globally Major world players have very active maritime economies in their countries for job creation, import and export controls, export of finished goods,etc. In South Africa it appears ad though the maritime industry is a hindrance to those with the need for developing port land into luxury apartments for the wealthy and also a great focus on our ports as points of tourism only. e.g. Cape town waterfront area, Durban harbour port tourism activities

Example Aquaculture and the proximity of the port are in conflict with possible constuction and the impact on the aquaculture activities.

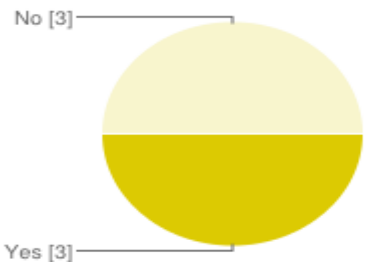
Aquaculture saldanha bay transport and business

12. Do you foresee MSP helping resolve such conflicts?



Yes	**12**	60%
No	**1**	5%

13. If "No" to Question 10 above, do you foresee any possible conflicts in maritime space use?



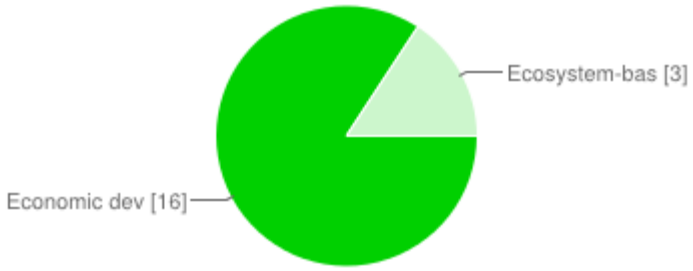
Yes	**3**	15%

No **3** 15%

14. If yes, which conflicting activities do you foresee competing for maritime space use in the future?

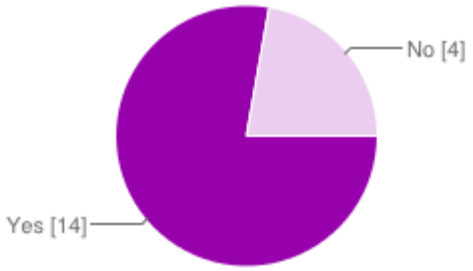
Aquaculture recreaction
Ports / Harbours and Recreational activites
Mining, fishing, aquaculture, industries, pollution, conservation areas (MPAs), recreational areas, etc.
South Africa has began exploring for oil and if reserves are found that will mean certain areas will be designated as oil blocks. Fisheries and shipping routes might be affected
Conservation and Tourism v/s developments especially oil industry activities
Possibly green energy initiatives (e.g., offshore wind farms)
With the reality of global warming more space will be required for maritime activities as the water levels are rising and claiming land. This could be a major conflict area between government and the private sector if it's not rectified early enough before too much urban investment. We are already following the Netherlands example of claiming sea area for port development as they have run out of space decades ago. Is it truly necessary to plan building a port between Robben Island and Cape town through reclamation?
Same as for question 11.
Poaching from an international level and monitoring of that space
Mining vs fishing vs environment (MPAs, spawning grounds, EBSAs, etc) vs recreation vs sub-sea infrastructure vs wind and current farms
Fisheries, Mining and Environment

15. MSP is a tool for?



Economic development and environmental planning & management	**16**	80%
Ecosystem-based management (ecological & biological sensitive areas)	**3**	15%

16. Does South Africa have scientific capacity to develop MSP?



Yes	**14**	70%
No	**4**	20%

17. If not, what are the discipline (skills) to be improved?

If not, then we should reach out to our African partners or BRICS partners, alternatively, develop this area and invest in the technology and human resources.

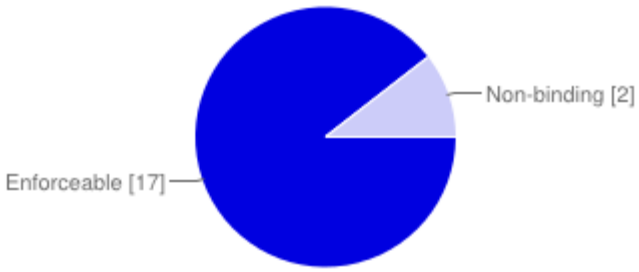
Safety Health and Environment Skills; Port Planning Skills

We have the skills, unfortunately many of the people with the skills are not employed by government departments and contracting consultants makes the process more costly.

Greater investment in research.i.e. CSIR,equiping institutions of higher learning to adapt curricula accordingly in the areas of required expertise. Benchmarking internationally with BRICS nations and major players. Policy development.

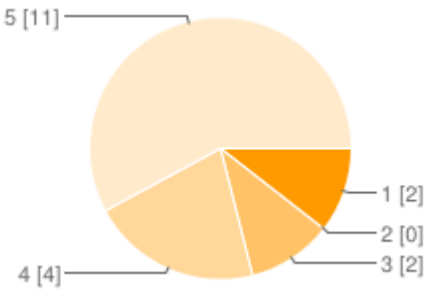
Maritime supply chain Technical and Engineering Maritime skills

18. Which legal regime must be applied to MSP?



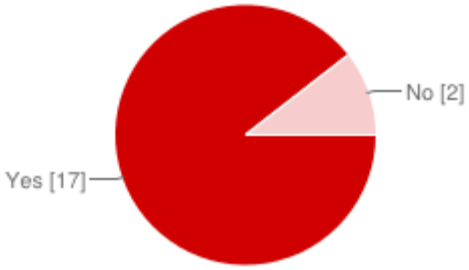
Enforceable	**17**	85%
Non-binding	**2**	10%

19. On a scale of 1-5 (with 1 being not important and 5 most important), do you think MSP is important for SA?



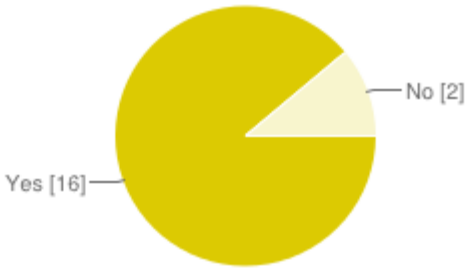
1	**2**	10%
2	**0**	0%
3	**2**	10%
4	**4**	20%
5	**11**	55%

20. Do you think MSP will encourage cooperative and collaborative governance?



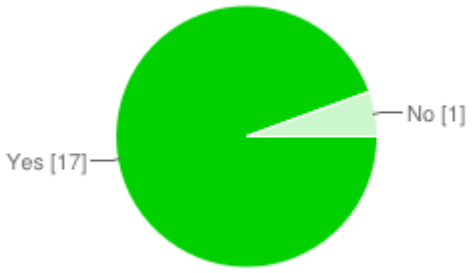
Yes	**17**	85%
No	**2**	10%

21. Will MSP improve coastal environment protection and health?



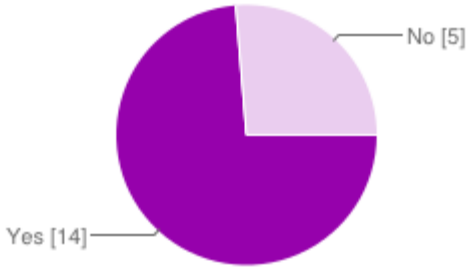
Yes	**16**	80%
No	**2**	10%

22. Will MSP improve coastal industrialization development and planning in SA?



Yes	**17**	85%
No	**1**	5%

23. Do you think there is Political Acceptance (Political Will) and acknowledgement towards development of MSP?



Yes	**14**	70%
No	**5**	25%

24. What are your expected outcomes from the development of MSP in South Africa?

Investment will be increased leading to job and business opportunities A better coordination within the space Sustainable use of resources for the benefit of future generations

All talk no action

a spatial development framework with guidelines,regulations and effective sea use 'rights'

To assist in rectifying past economical, social, environmental, cultural and ecological imbalances.

Agreement on the best use of the sea space, effective implementation of the MSP Plan, good monitoring

Better management of oceans and coasts

It is an opportunity which will allow SA to get the most out the coast line.

Using the Oceans Policy as a main governing legislature/ framework, MSP will assist with the operation plan on various ways to implement the policy and also manage conflicting needs by various stakeholders

There is lots of evidence in the scientific literature that marine spatial planning and systematic conservation/biodiversity planning can minimize losses and generate synergistic gains - financially and ecologically. E.g.: White, C., Halpern, B.S. & Kappel, C.V. (2012) Ecosystem service tradeoff analysis reveals the value of marine spatial planning for multiple ocean uses. Proceedings of the National Academy of Sciences, 109, 4696-4701.

Klein, C.J., Steinback, C., Watts, M., Scholz, A.J. & Possingham, H.P. (2009) Spatial marine zoning for fisheries and conservation. Frontiers in Ecology and the Environment, 8, 349-353. I believe that proper, co-ordinated, integrated, well-planned MSP that fundamentally protects the integrity of natural systems (ecological processes and biodiversity) but also allows for access to goods and services across all stakeholders will require negotiation but is achievable in South Africa. Further, its is the only way forward for truly sustainable development. If this is followed, we can protect our invaluable national assets (natural capital - biodiversity, etc), enhance the economy (see the White et al 2012 paper) and thereby facilitate achieving social goals through job creation, food security, and maintaining healthy ecosystems to support human health and well-being.

Identify potential marine economic benefits for creating employment opportunities within the maritime sector and ensure protection of marine environment.

Collaboration

Maritime Economic Zones; Increased job creation

Management of our Water Management of trawling Management of logo marine protected areas

Correct planning on use of maritime space through collective dialogue and adequate research. Entrusting this task to persons who are qualified and skilled in this area and forget about political appointments - get the job done!

Proper and Inclusive marine governance characterized by a participatory approach which involves both industry and civil society stakeholders. This would assist in maximizing benefits while keeping risks low.

Being able to prioritize areas for conservation and recognition of all the activities that are impacting on our coastal and marine resources.

dynamics in clusters

25. Thank you for your participation, please feel free to leave your comments and advises below.

Wishing you the very best with your study.

Please check the spelling and wording of some of your questions. A couple of questions are also quite redundant making the questionnaire confusing.

None

This is a great initiative and due to lack of MSP internationally so many seas are not monitored for the trawling and fishing. My email details are "…" I sit on the Olifants Estuary Management Forum where just doing coastal spatial planning is a difficult task.

Regards. Theresa. Please email me a copy of my input. Thank you for this opportunity to participate. Let me know should you have any queries or questions.

Great topic and I hope you forward your completed dissertation to those responsible in government for the said issue.

1) Related to point 1: MSP is not a legal requirement currently, but is receiving more prominent attention and is now becoming a priority for the DEA. 2) Point 15: should strive for balance between sustainable development and environmental protection 3) Point 7: SA currently considering setting up a government coordinating structure for oceans issues - can provide details later as documents currently classified 4) Regarding point 9: Extract from 1 of my documents - if you use this, pse acknowledge me - I can supply reference: There may be different legislative

options available to approve the Marine Plan (see Step 1, Task 2, Action 1). Currently, the easiest way appears to be by making use of the existing mechanisms within the ICM Act, especially: • The National Coastal Management Programme (S 44- 45); • Coastal Planning Schemes (S 56 - 57); or • Special Management Areas(S 23 - 24). If the ICM Act is used, the requirements of S 53 of the ICM Act, related to consultation and public participation, will have to be met. This section is produced here for convenience: "53. (1) Before exercising a power, which this Act requires to be exercised in accordance with this section, the Minister, MEC, municipality or other person exercising that power must— (a) consult with all Ministers, MEC's or municipalities whose areas of responsibilities will be affected by the exercise of the powers in accordance with the principles of co-operative governance as set out in Chapter 3 of the Constitution; (b) publish or broadcast his or her intention to do so in a manner that is reasonably likely to bring it to the attention of the public; and (c) by notice in the Gazette— (i) invite members of the public to submit, within no less than 30 days of such notice, written representations or objections to the proposed exercise of power; and (ii) contain sufficient information to enable members of the public to submit representations or objections." In addition to the above legal requirements, it is proposed that the draft Marine Spatial Plan is tabled for discussion at the following existing government structures before it is gazetted for public comment: • WG 8 of MINTECH; • Coastal Committees (National and four Provincial); • MINTECH; • MINMEC; • The Environmental Portfolio Committees (National and Provincial); • Cabinet Cluster(s) ; and • Cabinet. Depending on the legal option followed, the final Marine Spatial Plan may have to be gazetted. Ehler and Douvere (2009) point out that as part of this Task , consideration may also have to be given to the following issues, which may take a significant amount of time to address: • "Formal adoption of the spatial management plan, its goals and objectives, rules, and spatial management measures (including zoning plans and regulations, as appropriate); • Approving any new changes in management boundaries, if necessary; • Establishing any new institutional arrangement, e.g., an interagency coordinating council or inter-sectoral coordinating bodies, if proposed; • Approving any new staffing or organizational changes, if necessary; and • Approving the allocation of new funds to implement, monitor and evaluate the marine spatial plan, if proposed." Contact Niel Malan for elaboration if required

I was not able to answer some of the questions based on limited information available and lack of knowledge.

Q7. I am concerned that the subtext in question 7 is biasing people to respond "yes". I said "no" because then we would have DAFF, DEA and Maritime Affairs involved in decision-making in the marine environment. I think it would add to the problems rather than solving them. Q21-22 = yes, only if biodiversity/conservation planning is included as part of the MSP process... define "coastal"...? I consider "the coast" to be dunes to the nearshore, but some others consider "the coast" to extend to the EEZ. See this reference for a mix of conservation planning and marine spatial planning for the South African sandy shores: http://connect.nmmu.ac.za/Members/lharris.aspx?page=mypages&view=Theses Note also the SANBI website (http://bgis.sanbi.org) for access to the National Estuary Biodiversity Plan and the Fresh Water Ecosystem Priority Areas, as well as the Provincial Biodiversity Plans, which may be relevant as background to South Africa's other spatial prioritization programmes (and successes in that field). Good luck with the MSc. I think this is super valuable work - I look forward to the outputs.

This is a good topic, and long overdue