



# Chapter 4 Scenarios for the South African Maritime Sector

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## 1. Introduction

The economic importance of maritime trade around the southern tip of Africa was already appreciated by European explorers several centuries ago. In the 15th century, Bartolomeu Dias was appointed by King João II of Portugal to head an expedition to sail around the southern tip of Africa in the hope of finding a trade route to India. Muller (1969) reflects on the significance of Dias's discovery of this route:

*"The sight, during the first days of February [1488], of the African coast west of Mossel Bay must have been a moment of triumph for Dias. At last, for the first time, south of the equator, the coast ran in a new direction, which indicated that the 'southern shore' of the African continent had finally been reached, after more than seventy years, and that the passage to the India of the priest king and the glamorous riches of the East was now in sight."*

In the classic work, *An inquiry into the nature and causes of the wealth of nations*, Smith (1776) states: "The discovery of America, and that of a passage to the East Indies by the Cape of Good Hope, are the two greatest and most important events recorded in the history of mankind."

International trade has grown steeply since these discoveries, with total international trade standing at \$18,3 trillion in 2012 (UNCTAD, 2013). According to StatsSA (2004, 2006, 2012), water transport accounted for R4 594 million direct income for South Africa in 2002, which grew to R8 833 million in 2006 and R11 828 in 2012. In 2012, fishing and related activities showed a turnover of R7 914 million, whereas the building and repair of ships and boats had a turnover of R2 138 million over the same period (StatsSA, 2012). These figures exclude coastal and marine exploration and mining, construction, cargo handling and storage, research, tourism and social services.

While the promise of the maritime sector is highlighted in this retrospective view of the importance of discovering a trade route to India, it also provides a baseline to look at the future of the sector through the lens of scenarios. Scenarios can support future planning and action in South Africa's maritime sector, which has the potential of acting as a catalyst for investment, economic growth, employment creation and enterprise development in the country (Mokhele, 2012).

## 2. Scenarios

The concept of scenario planning originates in military applications. Sun Tzu (ca. 500 BCE) already acknowledged the importance of planning in the face of uncertainty 2 400 years ago by saying that "the general who loses a battle makes but few calculations beforehand. Thus do many calculations lead to victory, and few calculations to defeat: how much more no calculation at all! It is by attention to this point that I can foresee who is likely to win or lose" (Giles, 1910). In modern times, the scenario planning concept emerged as a method for military planning after World War II. The United States Air Force developed 'scenarios' of what



the enemy might do to enable it to prepare alternative strategies. This exercise was aimed at achieving a desired outcome in an uncertain future (Mietzner and Reger, 2004).

In addition to military applications, researchers at the RAND Corporation started to investigate the scientific use of expert opinion in planning for the future in the 1940s (Landeta, 2006). This formed the basis for the Delphi method for forecasting and decision-making, where experts provide structured feedback to questionnaires in two or more rounds (Glenn and Gordon, 2004; Landeta, 2006; Banuls and Salmeron, 2007). Royal Dutch Shell also used scenario tools to good effect in the 1970s, leading to a competitive advantage that enabled them to act quickly during the oil price shock of 1973 (Daum, 2001; Wilkinson and Kupers, 2013).

While Royal Dutch Shell is credited with leading scenario development internationally, it was Clem Sunter who popularised the use of scenarios in South Africa with *The world and South Africa in the 1990s*, featuring the 'High Road' and 'Low Road' scenarios (Sunter, 1987). These scenarios were based on work done by Anglo American Corporation teams in London and Johannesburg, which included Pierre Wack and Ted Newland, who were both previously employed by Royal Dutch Shell. Scenarios subsequently continued to play an important role in the political, economic and social transition in South Africa. Adam Kahane facilitated a process that became known as the Mont Fleur Scenario Project, which was launched in 1992. It explored what South Africa will be like in the year 2002. This scenario development process drew inputs from a very broad group of stakeholders, with all members of the team endorsing the resultant scenarios as valid mental models for how the future might unfold (Kahane, 1996 in Galer, 2004). In addition, the Department of Arts, Culture, Science and Technology (DACST) deployed scenarios and technology foresighting with a 20-year horizon in the development of South Africa's National Research and Development Strategy. In relation to this, Michael Kahn initiated and led the development of the South African National Research and Technology Foresight Project (DACST, 1999). The Dinokeng team (2009) developed *3 futures for South Africa*, which characterises future scenarios for 2020 based on the effectiveness of the state and the engagement of society. The resultant scenarios were named 'Walking Apart', 'Walking Behind' and 'Walking Together'.

Scenarios typically characterise the contextual environment in which a particular focal issue will play out in the future (Wolters et al., 2013). The key question is: "What are the most significant and most uncertain elements that could affect this focal issue in the future?" The various answers to this question result in drivers of change that will typically be represented in a scenario matrix. Based on this matrix, scenario stories are developed that provide perspectives of what the world may look like under different conditions of the drivers of change. Strategies that are robust in the plausible future can then be developed. These strategies steer the drivers of change in the desired direction.

Scenarios can represent different future states for one particular driver, such as the four scenarios for the reinvention of Europe, which are all related to treaties (Leonard, 2011). These scenarios include 'Asymmetric Integration' (working around existing treaties), 'Smaller Eurozone' (existing treaties, but fewer countries), 'Political Union through Treaty Change' and 'Federalism without Federalists' (agreement outside the scope of the European Union (EU) treaties). The 'High Road' and 'Low Road' scenarios (Sunter, 1987) and the geopolitical scenarios for the BRIC countries (Brazil, Russia, India and China) (Suárez de Vivero and Rodríguez Mateos, 2010) were also developed around one main driver. Another popular approach to scenario development is to identify two key drivers and develop four scenarios out of these. This approach was



adopted for the Dinokeng scenarios (2009), the Blue Growth Study (Ecorys et al., 2012) and the Water Sector Institutional Landscape by 2025 scenarios (Claassen et al., 2011). Scenarios can also be based on different combinations of multiple drivers, which has been the case for the Global Marine Trends 2030 scenarios (Lloyd's Register et al., 2013).

A number of scenario projects have recently been completed in the international maritime sector. *Global marine trends 2030* (Lloyd's Register et al., 2013) states that the marine world in 2030 will be almost unrecognisable owing to the rise of emerging countries, new consumer classes and resource demand. The authors identified 'Status Quo', 'Competing Nations' and 'Global Commons' as future scenarios for the marine world. The EU Blue Growth Study (Ecorys et al., 2012) set out to develop a comprehensive, robust and consistent analysis of possible future policy options to support smart, sustainable and inclusive growth from the oceans, seas and coasts. The study identifies sustainability and economic development as the main axes, which result in the presentation of four different scenarios: 'Boom and Bust', 'Pursued Growth', 'Fragile Recovery' and 'Sustainable Growth'. Suárez de Vivero and Rodríguez Mateos (2010) developed geopolitical scenarios that were named the 'Arctic Scenario' (global warming leading to Arctic waters becoming navigable and providing access to resources), the 'Indo-Pacific Scenario' (focused on the greatest concentration of people and the greatest seaway for maritime traffic in this region) and the 'Southern Scenario' (with the southern hemisphere assuming greater importance on the world stage).

The aim of this chapter is to present the development and storylines of different potential scenarios for the South African maritime sector (the Maritime Nation scenarios), and then to reflect on how to best utilise these scenarios as a tool to support decision-making, future planning and action for the sector.

### 3. Drivers of change

Contemporary policies and strategies do not deal comprehensively and systematically with the impact that changing conditions (drivers) may have on the future of South Africa as a maritime nation (DoT, 2008; RSA, 2013; RSA, 2014). This scenario development process drew on South African, as well as international scientific papers, strategy documents and institutional plans (listed in the footnotes of Figure 2 and Figure 3). It also drew on the proceedings of the National Integrated Marine and Maritime Technologies Workshop<sup>1</sup> (Funke and Claassen, 2014a) to identify key drivers related to the maritime sector that could cause significant change and indicate the uncertainty of change. The focal question against which the key drivers are assessed is: "What are the drivers that are most significant and most uncertain that could affect the degree to which South Africa will be a maritime nation by 2030?"

Such drivers should be relevant to the main themes and the cross-cutting themes that were used to structure the content of the presentations at the workshop and to help demarcate the scope of the sector (Figure 1). Shipping and transport, marine resources and marine tourism provide the broad scope for the sector, while the subthemes indicate application areas such as logistics infrastructure, offshore energy and mining, sports and recreation, and leisure.



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<sup>1</sup> This workshop brought together 103 stakeholders from across the maritime sector, representing universities, research organisations, government, parastatal organisations, non-governmental organisations (NGOs) and the private sector. The workshop provided an opportunity for stakeholders to present the latest research and technology in the sector and to engage in networking (Funke and Claassen, 2014a).

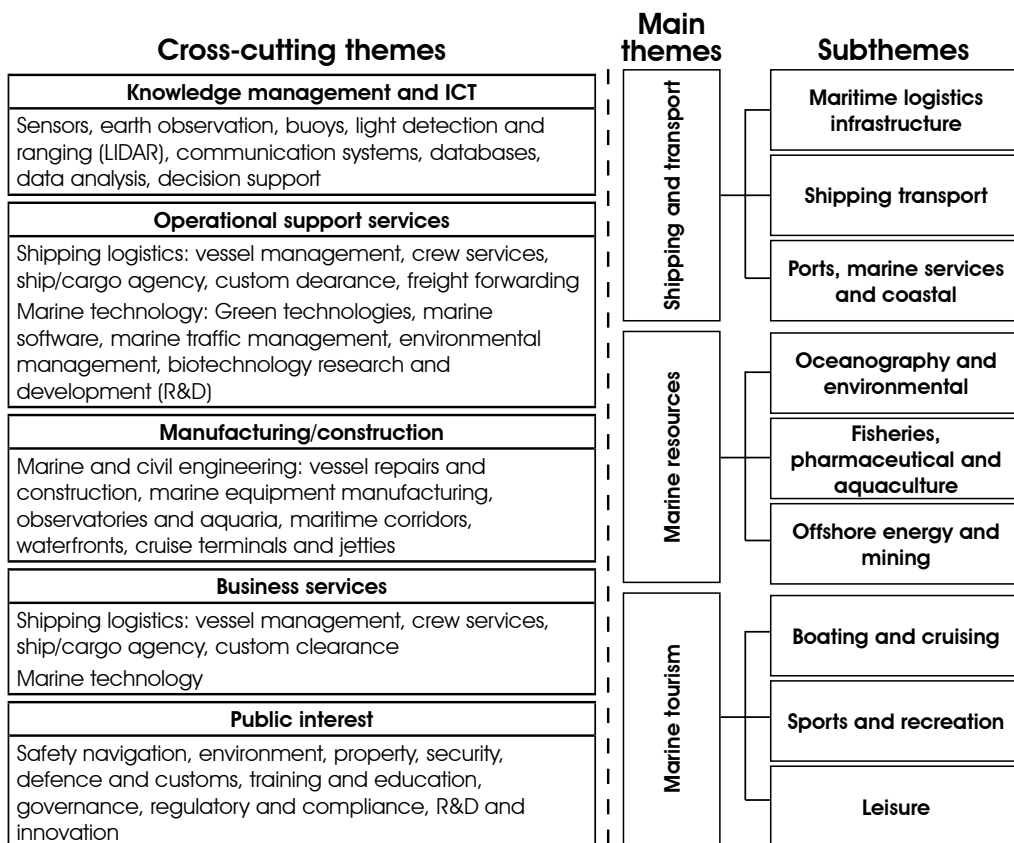
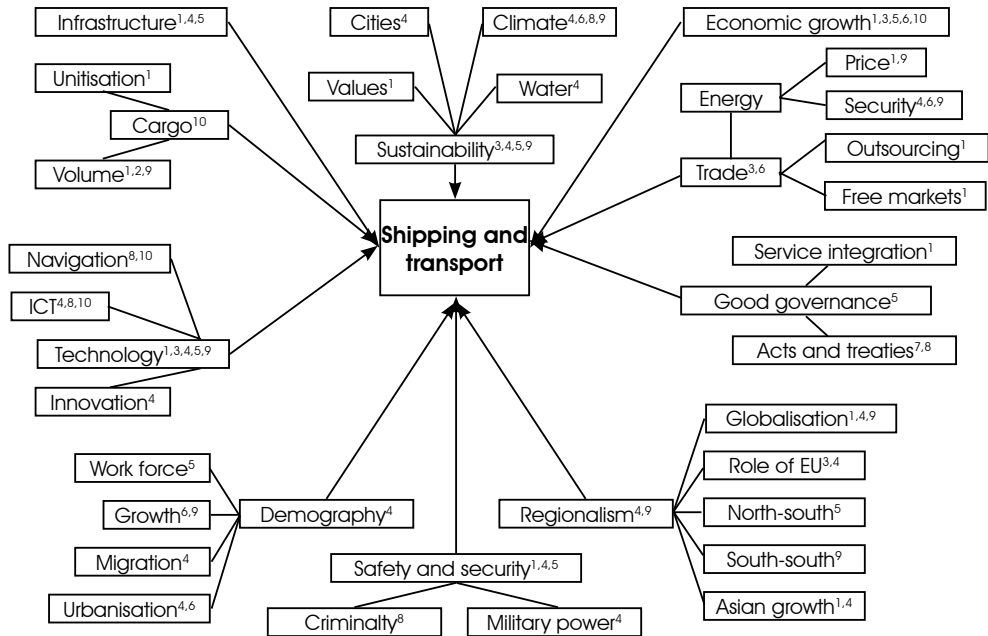


Figure 1: Main themes, subthemes and cross-cutting themes for the South African maritime sector (adapted from Mokhele, 2013).

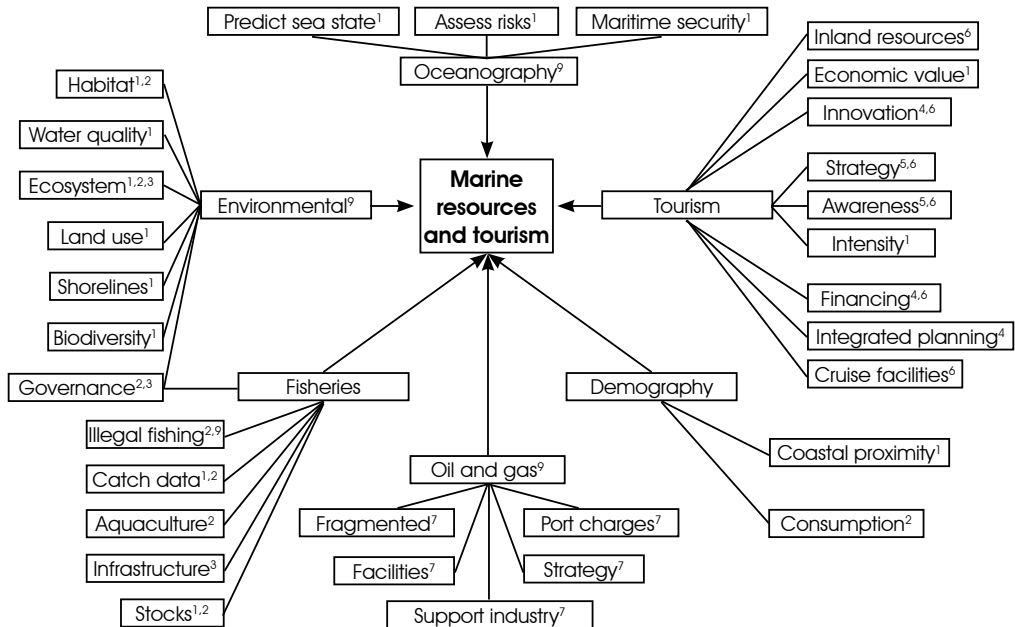
Drivers of change related to 'shipping and transport' were drawn from scientific papers, regional strategies, industry reports and workshop proceedings through data mining (DocFetcher Development Team, 2014). The specific sources are linked by the superscript numbering and footnotes in Figure 2. The drivers fall in the broad areas of sustainability, economic growth and trade, governance, regionalism, safety and security, demographics, technology, cargo and infrastructure. The context in which the drivers are mentioned is related to coordination within shipping and transport and linking different elements to improve overall efficiency (EC, 2011; Leonard, 2011; AU, 2012; Republic of Ireland, 2012; UNCTAD, 2013; Funke and Claassen, 2014a; Pekkarinen and Repka, 2014). The drivers are also listed in terms of the requirement to develop and implement advanced technologies and innovation (Kuronen et al., 2009; EC, 2011; Republic of Ireland, 2012; Leonard, 2011; AU, 2012; Funke and Claassen, 2014a).

The drivers that are significant and uncertain in relation to 'marine resources and tourism' were drawn from global reviews and South African analyses. They include oceanography, tourism, demography, oil and gas, fisheries and environmental issues. The drivers of change related to these areas are shown in Figure 3, with superscript numbering and footnotes indicating the sources. The drivers are also listed in relation to dependencies between different elements, as well as the advancement of new technologies.



(<sup>1</sup>Kuronen et al., 2009; <sup>2</sup>Pekkarinen and Repka, 2014; <sup>3</sup>Walters et al., 2013; <sup>4</sup>EC, 2011; <sup>5</sup>Republic of Ireland, 2012; <sup>6</sup>Lloyd's Register et al., 2013; <sup>7</sup>Leonard, 2011; <sup>8</sup>AU, 2012; <sup>9</sup>UNCTAD, 2013; <sup>10</sup>Funke and Claassen, 2014a.)

**Figure 2:** Drivers of change for the shipping and transport thematic area.



(<sup>1</sup>Burke et al., 2001; <sup>2</sup>Beveridge et al., 2013; <sup>3</sup> Republic of Ireland, 2012; <sup>4</sup> EC, 2012; <sup>5</sup> Tourism Business Africa, 2014; <sup>6</sup>SAMIC, 2012; <sup>7</sup> SAMSA, 2012; ; <sup>8</sup>Funke and Claassen, 2014a.)

**Figure 3:** Drivers of change for the marine resources and tourism thematic area.



## 4. Scenario matrix

The drivers of change identified above were further evaluated from presentations and discussions at the Integrated Marine and Maritime Technologies Workshop (Funke and Claassen, 2014a), the proceedings of the Integrated Marine and Maritime Technologies Thought Leaders Indaba (Funke and Claassen, 2014b), and discussions that were held at regional workshops in Pretoria, Durban and Cape Town (Funke et al., 2014). All of these events (April and May 2014) dealt with the development of the *Research, Innovation and Knowledge Management Road Map for the South African Maritime Sector*.

The discussions at the abovementioned technologies workshop, indaba and regional workshops revealed key characteristics in relation to the drivers of change. The first relates to the extent of the uptake of research, innovation and knowledge management in the maritime sector, whereas the second relates to the extent to which the sector is unified. A unified sector would have shared objectives, coordinate activities efficiently and deploy resources effectively to achieve the shared objectives. These two characteristics constitute the axes for the scenario matrix, as presented in Figure 4. The two axes bring about four possible scenarios.

The bottom left scenario in Figure 4 describes a future where the maritime sector is divided and where there is limited uptake of research, innovation and knowledge management. In such a situation, South Africa could be described as a stagnant maritime nation. This scenario is entitled 'Lost at Sea'. The bottom right scenario in Figure 4 describes a future environment where the sector is divided, but the uptake of research, innovation and knowledge management is extensive. This represents an opportunistic maritime nation and it is called 'Islands of Excellence'. The top left scenario in Figure 4 describes a future where there is limited uptake of research, innovation and knowledge management, but where the sector is unified. This results in a maritime nation lagging behind international peers and competitors in relation to technology development and uptake. This scenario is called 'Rowing Together'. The final scenario (top right in Figure 4) combines the extensive uptake of research, innovation and knowledge management with a unification of the sector to support a prosperous maritime nation. This scenario is called 'Full Steam Ahead'. The characteristics of these scenarios are discussed in the next section.

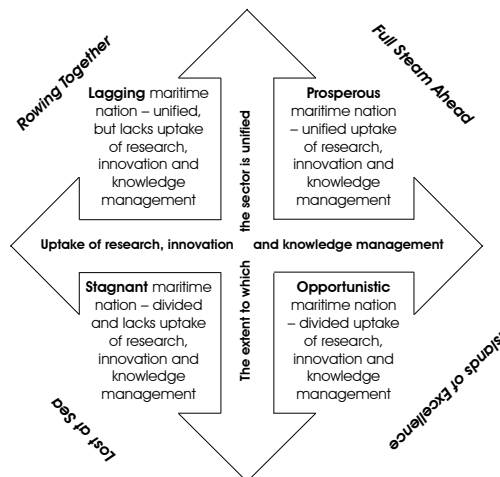


Figure 4: Scenario matrix, with sector unification and technology uptake as key drivers.



## 5. Scenario stories

The 'Lost at Sea' scenario depicts a future with divergent actions and little progress. An investor, reflecting on his experience while looking for investment opportunities, may write the following in his diary on 6 June 2030:

*"I returned from a series of engagements with actors in the South African maritime sector today. I was looking for opportunities to invest in a sector that clearly has a great deal of potential. At first glance, infrastructure investment seemed to be a logical choice. However, it soon became clear that the integration between application areas to optimise infrastructure is lacking. An example is the ship-building and repair sector, which can't secure sufficient long-term commitments with ports to justify specific investments. I was also very surprised at the poor coordination, communication and uptake of maritime-focused research results, which put investments in potentially very lucrative areas such as ecotourism and offshore oil and gas exploration at risk. I have come to the conclusion that the sector is too divided to warrant investment, while the lack of innovation paints a bleak picture for the future."*

The 'Islands of Excellence' scenario describes a future where vibrant innovation is supported by the uptake of research and effective knowledge management, but this is limited to specific actors in the sector and does not translate into an integrated maritime sector. A senior government official tasked with developing the maritime sector may make the following reflections in his management report of 12 April 2030:

*"We have been successful in supporting the fisheries sector as a result of groundbreaking new technological developments. Applied research in the sector has contributed to the development of a solid understanding of existing fish stocks, which we can use to achieve our aim of ensuring productive and sustainable catches. Relevant information is available on an interactive web-based system, which gives fleet operators real-time information about conditions and catch trends. This system also provides processing facilities with relevant information about incoming catches and offers links to distributors and international markets. We also have modern and efficient fish-processing facilities, which could create jobs and contribute to food security. An issue hampering further progress in the fisheries sector is the lack of cooperation between stakeholders, as well as instances of rivalry. This has meant that the significant technological developments that have taken place only benefitted certain pockets of the sector rather than benefitting the sector as a whole."*

The 'Rowing Together' scenario reflects a situation where the actors in the maritime sector work together in an integrated way to make South Africa a maritime nation. However, effort towards this goal is constrained by a lack of innovation, limited uptake of research and poor knowledge management. A labour union leader may say the following in his annual address to the union's members on 4 April 2030:

*"As a labour union, we are pleased to see the high level of cooperation and integration in the sector. This coordinated approach allows for an effective response to the changing demography in our coastal areas and connected inland areas. The development of primary skills, which is coordinated across the maritime sector and with other sectors, has resulted in increased opportunities for employment and skills development for our members. The coordinated sector voice is also conducive to*



*providing South Africa with a strong position in international negotiations and in response to regionalisation. Since the maritime sector is characterised by good governance, government and investors now have more confidence in the sector than ever before. Unfortunately, I don't only have good news... Our main concern at this point is the very slow uptake of research, the slow rate of innovation and poor knowledge management, all of which continue to constrain economic growth in the sector and have a detrimental impact on job creation. Comrades, the battle is not won yet! More is still needed to put bread on the ordinary worker's table!"*

The 'Full Steam Ahead' scenario represents a utopia for the sector. Under this scenario, the sector is unified in its approach to remaining globally recognised as a leading maritime nation and benefits from the commissioning and resultant uptake of research, high levels of innovation and effective knowledge management. The Minister of Maritime Affairs of another country may reflect on this in her address to that country's Parliament:

*"Honourable members. We may call ourselves a maritime nation, but we lag behind other nations in terms of how we leverage our maritime resources to support social and economic development. Here I will present South Africa as an example of a prosperous maritime nation that has managed to pull its maritime sector together into a coherent whole to support and empower national government and policy. This country's focus on maritime safety and security has led to the effective protection of its maritime resources, an improved level of national security and limited criminal activity in its Exclusive Economic Zone. This has resulted in a safer South African coastline and offshore environment, which has led to greater levels of local, regional and international trade. These impressive developments are also underpinned by very effective support infrastructure and knowledge-sharing systems. The country's coordination of its maritime sector is phenomenal, with relevant information flowing across the sector in a seamless way, leading to high levels of innovation and ultimately strongly supporting economic growth. If you think all of these accomplishments are remarkable, the most remarkable fact of all is that South Africa's maritime sector has managed to achieve all of this in only 15 years, after starting from very humble beginnings. I will now table our strategy to emulate South Africa, so that we can also move forward as a maritime nation!"*

## Conclusion

As already suggested, one of the purposes of developing scenarios for the maritime sector is to identify preferred future outcomes and to assist actors to navigate towards such outcomes through explicit decisions and actions. The drivers of change can be used as indicators (Figure 2 and Figure 3) to assess the current state and the trajectory of change related to the scenario matrix (Figure 4). The path towards the preferred option ('Full Steam Ahead') should be consciously planned and incorporated in government and private sector strategies and plans. Inadequate planning and action should be avoided, as this would likely cause a decline in uptake and collaboration and lead to South Africa ending up in the worst-case scenario ('Lost at Sea'). A push towards technology uptake without sector-wide coordination will take the sector towards the 'Islands of Excellence' scenario, whereas sector coordination without the benefit of innovation will lead to a future of 'Rowing Together'.





A potential way forward for the Maritime Nation scenarios presented in this chapter could be to present them to a wide representation of stakeholders in the sector to obtain further inputs and eventual agreement and 'sign off' on their contents. This would require a key stakeholder in the sector taking ownership of the scenarios and committing to making the time and funding available to finalise them. A communication strategy targeting potential users would subsequently need to be developed and implemented. The revised scenarios could then be used for strategy development, planning and management in the maritime sector.

The first group of potential users of these scenarios is made up of the different government departments that operate in the maritime sector. They would need to be made aware of the scenarios and their implications and they would need to apply their minds to how these scenarios (particularly the desired 'Full Steam Ahead' scenario) can be made relevant to the development of national strategies. The second group of potential users is made up of non-government actors. In this category, researchers would need to be made aware of these scenarios, since they can help detect and report change. Their inputs could then be used to track where the maritime sector is heading in terms of the different scenarios. In addition, members of civil society, non-governmental organisations (NGOs) and communities, have practical experience and awareness of what is happening in the maritime sector and could provide feedback on priorities and trends.

If all of the potential users above are aware of the possible preferred and adverse futures for the maritime sector, this may inspire them to consciously adjust their choices, plans and actions so that they can navigate towards and end up living in the 'Full Steam Ahead' scenario.

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