Implementation of the Research, Innovation and Knowledge Management Road Map for the South African Maritime Sector

Report on Sector Coordination

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Implementation of the Research, Innovation and Knowledge Management Road Map for the South African Maritime Sector: Sector Coordination

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Disclaimer: This report includes the combined proceedings of four regional workshops on the topic of the implementation of the Road Map. The views expressed in the proceedings section of this report represent those of the workshops participants and not the CSIR team or the South African International Maritime Institute (SAIMI), the funder of the workshops.
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Introduction

Background

The Research Innovation and Knowledge Management Road Map for the South Africa Maritime Sector (hereafter referred to as the Road Map) includes a set of eight high-level objectives, each of which characterises and complements the stated vision for the maritime sector. The vision is for South Africa to be globally recognised as a maritime nation by 2030. Each of these objectives has been translated into a number of actions which collectively map out the road that needs to be followed for South Africa to get from the current state to the desired state.

The sector coordination component of the Road Map implementation process set out to communicate the Road Map across the maritime sector, to build on the previously established network for engagement on various aspects of the Road Map, and to facilitate regional Road Map implementation discussion sessions.

The approach to sector coordination followed information sharing and solicitation of inputs thorough email and electronic media, whereas the regional discussion sessions brought people together to reflect on the progress of activities linked to the implementation of the Road Map and to define priorities and opportunities for implementation.

Specific Objectives

The specific objectives of this phase of the Road Map implementation were to:

1. Establish a Road Map implementation network, including academia, government, private sector, non-governmental organisations (NGOs) and societal representatives and provide platforms for sector engagement.
2. Prepare a communication in the popular media to promote maritime awareness and Road Map implementation
3. Facilitate discussions on specific topics related to the Road Map implementation. These include perspectives on current postgraduate research and research gaps for future postgraduate studies.
4. Facilitate a workshop to discuss the status quo of research, innovation and knowledge management in the maritime sector in relation to the Road Map and to identify opportunities and priorities going forward.

The Regional Workshops

The Workshop agenda

Four regional workshops were held during week of 29 May – 2 June 2017. These were held in Pretoria, Cape
The attendance registers are attached as Appendix A. The workshop agenda included an overview of the Road Map, a status quo discussion, a positioning of the Road Map in a national context and a discussion on priorities, opportunities and constraints.

The table hereunder was presented to highlight the complementarity between the Road Map and Operation Phakisa.

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The regional workshops were organised in terms of status quo and future perspectives discussions on research, innovation and knowledge management in relation to the Road Map. The inputs were then organised according to key themes, which are presented in the following section under relevant thematic headings. Key points related to the implementation of the Road Map are provided towards the end of the report.

**Links to national development**

To what extent can we or should we isolate the ocean’s economic contribution from the overall gross domestic product (GDP)? The time has come for us to think differently about the country’s GDP and the contribution the ocean makes to it. Related to this point, the South African economy is currently divided into sectors or silos. This way of viewing the economy does not reflect reality as the value chain and thinking and planning around value creation run across sectoral boundaries.

An important national development was the launch of Operation Phakisa which finally signalled South Africa’s realisation that it is a maritime nation and that it is ready to take the development of the oceans economy seriously. Several examples of positive developments were mentioned. Firstly, the considerable expansion of places like Saldanha will increase the gains for the blue economy in the region. Secondly, there has been a considerable increase in the country’s manufacturing and maintenance ability under Operation Phakisa over the past two years. Thirdly, the South African Boat Builders Export Council (SABBEX) and the South African International Maritime Institute (SAIMI) have been established. Fourthly, Parliament recently approved the Department of Transport’s (DoT) Comprehensive Maritime Transport Policy. These and other developments make it possible to bridge silos within and beyond the maritime sector.

On the negative side, one of the problems with Operation Phakisa is that it promised considerable benefits and job creation to South Africans but in the process also created expectations that have not been met. This is causing considerable dissatisfaction amongst people who feel they have the right to access the opportunities that have been promised. The problem is that these opportunities will not be realised in the short term. While much has been invested in the construction of infrastructure, one still needs an enabling environment for financing, funding and investment through micro-financing, incentives, bursaries etc. This also requires developing an understanding of the “what” and “how” of the overall blue economy market and network. Operation Phakisa needs to communicate how people can really benefit from the initiative without creating false expectations.

R7 billion went into infrastructure for Operation Phakisa. Government hoped to unlock money for boat- and ship building which would create an opportunity for maintenance, repair and manufacturing, but this has not happened yet. An important development in this regard is the Department of Trade and Industry’s (the dti) Marine Manufacturing Development Plan. This plan aims to grow South Africa as a hub for the design, building, manufacturing, repair and maintenance for boats. A number of initiatives support this aim. Examples include a pilot skills development project, the introduction of a 60% localisation programme for working vessels for state-owned companies (which translates to 60% of the vessel having to be constructed in South Africa), attracting government finance and identifying ways to promote the design of boats within South Africa.

In terms of the boat- and ship building industry government involvement is needed and banks need to be more open to assist with financing. What incentives can be made available in this regard?
Also on the point of investment and financing, it is important to realise that economic growth is very important when it comes to South Africa’s maritime sector. The sector is currently not getting the investment it needs. We need to acknowledge that global economic growth is slow and that this will constrain resources for some time. On the other hand, one could argue that because economic growth is slow, now might be the best time to create opportunities because costs are lower.

Finally, it is important to acknowledge that in South Africa we have considerable historical knowledge with regards to our land-based economy and therefore need to recognise that the development of our ocean economy will take time and cannot be expected to happen overnight. We have also been able to develop the right skills in the right sectors – for example engineering and the automotive agriculture industry. Similarly, as a country we have developed the necessary tools to support the land-based economies – for example the Land Bank for the agricultural sector and the Industrial Development Corporation for the mining sector. We now need to develop similar tools for the blue economy, especially finance institutions.

**Regional and international competition and cooperation**

South Africa is a key actor in terms of the coastal and security elements of the continental and regional maritime sectors. Its upcoming position as the chair of the Indian Ocean Rim Association (IORA) will provide it with an even greater opportunity to cement its leadership. Here it is also important to consider how South Africa is being perceived from the outside – is it seen as a nation divided or as a maritime nation? The problem of South Africans themselves not perceiving their country to be a maritime nation persists.

There is also a need to incorporate international convention requirements into national legislation since the two levels are not always completely aligned. South Africa is very good at taking part in conversations and signing conventions with regards to the ocean but the time has come to implement. It is important not to follow the example of some West African countries where champions take it upon themselves to try and make a difference but are unable to obtain buy-in from decision-makers. It is very important to obtain such buy-in so that important decisions can be made and implementation can take place. One should also not underestimate the ambitions of other African countries to become the maritime hub of Africa. South Africa needs to be aware of this competition and find ways of managing it.

On the cooperation side of things, partnerships between neighbouring countries are important (e.g. in terms of piracy, illegal fishing etc.), but it is particularly difficult to implement these due to a lack of regional interest in pursuing and implementing a common strategy. Instead, African countries prefer to pursue international partnerships (for example in terms of higher education). Information sharing between countries is also a big constraint as there is a lack of trust and cooperation between the countries in the region. The region therefore requires a mindset change amongst its leaders so effective partnerships can be established. This also means that leaders should recognise that rather than compete with each other, African countries should work together to increase the opportunities available to everyone. The African Integrated Maritime Strategy (AIMS) provides an opportunity for regional cooperation.

**Sector awareness**

It is important to recognise what has already been achieved in the maritime sector. The South African Maritime Safety Authority (SAMSA) has done quite a lot in terms of raising awareness about the South African maritime curriculum and a considerable number of people from inland areas have been moving to the coast to take up job opportunities in the maritime sector, often because they have become exposed to these opportunities. In addition, while until recently a number of “very loud voices” have been dominating the sector, less dominant voices, such as those of the publishing industry, are slowly but surely also being heard. For instance, the African
Maritime Journalist Association has been mandated to help promote the maritime agenda on the African continent, specifically through the media.

Nonetheless, despite these positive developments, there still seems to be a disconnect between the school and higher education levels in the maritime sector. Learners at schools are generally not being made aware of maritime-related higher education opportunities (e.g. career days are dominated by other sectors such as banking and engineering). Preliminary research conducted by Denel Maritime shows that only four schools offer maritime subjects. Some universities in South Africa do offer maritime-related courses/degree but young people often do not know what these are or where they are being offered. How can one recruit young people to become part of the maritime sector if they are not aware of the opportunities that exist? The South African Maritime Professionals Association (SAMPA) has started addressing this need by developing an information booklet for learners which will help to create awareness about the maritime sector.

Another way of making learners aware of the importance of the maritime sector is by entrenching important concepts, such as those of import and export and transporting goods across the ocean, in the school curriculum. This is akin to the ethos of the South African Constitution already having been incorporated into the school curriculum.

Awareness raising about career opportunities in the maritime sector and more general awareness about the significance of the maritime sector should not be limited to learners at school but should extent all the way to the Presidency. This can be done in two ways, firstly through government and its prioritisation of the blue economy and secondly, through a bottom-up approach such as outreach programmes to youth. An accessible way of making sense of the very complex maritime space is by communicating developments in the sector under the headings food, fuel, transport, tourism and environment. The issue of environmental protection is particularly pertinent if South Africans want to continue enjoying the benefits the ocean has to offer. This includes ensuring the successful management of the newly declared marine protected areas. The ocean economy is everybody’s business and everyone needs to understand that they are part of it. Another priority is to educate politicians about the maritime environment and economy when they have to represent South Africa’s interests at international forums.

**Institutional arrangements/ roles and responsibilities**

There seems to be considerable fragmentation in the sector, including government, and there is a definite need for coordination between the different components of the sector as well as buy-in from different government departments. Often it is important to find the “right” people from different institutions to collaborate with each other, however the problem comes in when people change jobs which requires one to start from the beginning. While Operation Phakisa has already achieved quite a lot in the sector, it does not always pursue its activities in a coordinated and constructive way.

A number of lessons can be learned from the Cooperative Inland Waterways Safety Programme (CIWSP) which is very strong on stakeholder collaboration in the case of inland water body safety incidents, e.g. between the police, the Department of Water and Sanitation (DWS) and SAMSA. Further on the point of inland waters, we need to look at the links between inland waters and the coastal and ocean environments to enhance coordination within the maritime sector and between the maritime sector and inland-based sectors.

An example of a lack of coordination in the sector is the case of small harbours. These currently fall under the Department of Public Works (DPW) but the Department of Agriculture, Forestry and Fisheries (DAFF) and the Department of Environmental Affairs (DEA) also have an interest in them in terms of fisheries management and
environmental protection. DoT is also an interested party. The City of Cape Town recently tried to take the small harbour development/management function from DPW because they argued that DPW was being ineffective.

The sector also needs to be better at organising itself to support high level initiatives. For example when a ministerial delegation meets with other countries on maritime issues, the sector needs to be able to pull together the right people to advise and support the delegation. This also means that the roleplayers in the sector need to learn how to collaborate with each other.

The idea of a Department of Maritime Affairs continues to come up in discussions and should not be taken off the table. Such a department will need to cooperate intensively with other government departments and therefore requires strong and capable leadership.

An example of an institution that needs to be considerably more capacitated and empowered is local government. Looking at shale gas exploration, for instance, local municipalities have been side-lined and left behind due to a lack of capacitation, knowledge and power. Also, while the integrated development plans (IDP) of municipalities often feature exciting plans there are many cases where these are not implemented due to a lack of skills and capacity.

**Training and skills development**

The development of seafarers is a long-term investment which results in a cascading effect back into the sector. Funding for education and training was limited in the past, but SAMSA, SAIMI and the National Skills Fund (NSF) are now supporting seafarer training through Operation Phakisa’s working groups. Nonetheless, still not enough seafarers are being trained in South Africa. Currently, the country only has 240 training seats available and the private sector is also attempting to play a bigger role in this regard.

South Africa is recognised internationally as a place where good seafarers are trained, but seafarers receive very little recognition in South Africa itself [low National Qualifications Framework (NQF) level]. This situation makes it very difficult for seafarers trained in South Africa to find shore-based employment because they would only earn a small percentage of what they are able to earn on ships. It also makes it difficult to find lecturers. In addition, given the lack of recognition of seafarers’ qualifications in South Africa it is difficult for SAMSA to make this career path attractive to prospective students.

Another problem is that South African seafarers are three times more expensive than international (e.g. Indonesian) seafarers. Given the fact that the sea staff constitutes 60% of the cost of running a ship (excl. fuel), and 30% is a fixed cost, this represents a significant portion of shipping costs.

In addition to a need for seafarers, there is also need for the training of crew members, engineers, marine architects. These are skills South Africa once had and that made people employable in the sector. The country has lost many of these skills over time and needs to rebuild them. Other skills that need to be developed are skills in aquaculture and marine tourism, as well as in the legal and policy domains in order to resolve the many issues (e.g. gaps, barriers and red tape) currently characterising the South African maritime policy environment. In developing these skills, South Africa must adhere to international standards to ensure that it is competitive.

It is interesting to note that the South African Institute of Civil Engineers has formed a “marine division” to develop the “marine engineering” sector. This refers to civil engineering/infrastructure, for example, breakwaters, slipways, drydocks/ports and harbours etc. and is different from the standard definition of marine engineers which refers to mechanical engineers who have acquired additional skills and attend to ships’
Offshore oil and gas skills development should also be included in the suite of maritime qualifications offered in South Africa. The need for oil and gas industry-related skills could be assessed on a short- to medium-term basis. The possibility also exists to reskill people rather than training them from scratch. If jobs in the oil and gas development industry are available internationally, South Africa could export its skills until more jobs become available here. Should one train in anticipation of these jobs becoming available or should one wait for the jobs to be created first and then train for them? How available are jobs in the offshore oil and gas industry internationally? If there are many such jobs available, South Africa could export its oil and gas industry-related skills until more jobs become available here.

Ship building and repair is another part of the maritime sector with considerable potential. We need to find the best way of making use of our existing facilities (e.g. the Naval dry dock in Simon’s Town and the ship maintenance facility in Saldanha). Again, reskilling could be a good strategy here. It is also important to conduct skills assessments to determine where the skills shortfalls lie and how to acquire additional skills needed.

From a skills retention perspective, an important question to ask is how one can retain maritime skills and prevent people from working overseas. Why are the job prospects or working conditions in the maritime sector not attractive enough for people to stay here? Here one can argue that it is important to pay people enough so that they will want to stay and not work overseas for better salaries. People with maritime-based qualifications going overseas should also not necessarily be seen as something negative; this is an opportunity for the South African maritime sector to be represented globally.

Maritime industry involvement

It is often very difficult to get industry to become involved or support initiatives in the maritime sector as industry is mostly concerned with how engagements of any kind will boost its bottom line. Some potential industry partners are slowly coming aboard the oceans economy initiative but much work remains to be done.

In this regard, there should be considerable emphasis on public-private collaboration and on looking at learning from other countries, for example Italy. The dti and DoT have tried to promote such collaboration by taking private sector partners to international investment roadshows for oil and gas, ports infrastructure and provision of tugs etc. and to promote South Africa’s maritime services across the world.

Coastal and marine tourism

An important question around coastal and marine tourism refers to issues of scale. Should it be marketed as small, niche, eco- or organic, or should it take on a big, commercial character? What would government prefer and what would the locals and tourists prefer? Also, how can one deal with user conflicts/competing interests such as tourism vs fishing. (Here once can refer to the ecosystem-based management approach as with the Benguela Current Large Marine Ecosystem) and environmental pollution threats such as sewage outfalls. Strategic spatial planning could be implemented to accommodate the needs of competing stakeholders.

Specific areas linked to coastal and marine tourism that could be further developed include:

- South African coastal real estate, which is in demand both domestically and internationally.
- The economies of small towns (fishing towns) and the potential of their harbours and ports to contribute to the GDP through the fishing sector or the tourism sector.
• The development of small-craft harbours which should be multi-purpose and include smaller fishing and tourism operators, fish sales to the public, boat trips, leisure/restaurants, tourist accommodation, recreation e.g. boating/kite surfing/etc. This would also require specific port logistics. It is also important to note that the improvement of small harbours is being constrained by wrecked/sunken boats. There is therefore a need to involve lawyers regarding the removal of wrecks as this is a legal and not an engineering issue.

Coastal and marine tourism also offers potential for public-private partnerships. One example is the potential to set up a cruise terminal at the Cape Town V&A Waterfront (to expedite the process of passengers getting off ships to get through passport control and pursue tourist activities in in Cape Town). Another example is the Volvo Ocean Race.

Education and research (including resources)

From an education perspective it is important to define the role of school level education and higher education in the maritime sector. At school level it is also important to upskill teachers in terms of marine and maritime-relevant content as there is not enough capacity amongst teachers in this regard.

At higher education level it is important not to emphasise the academic track too heavily at the expense of the technical track as this is often where the greatest need for skills lies, e.g. for artisans, plumbers etc. Which skills are needed, where does the capacity lie to develop these skills and how can new programmes be designed to fit with these requirements? There is also a need for more mentorship and internships in the sector to ensure that training is sector-relevant.

From a research funding perspective, a particular concern is that funding for research in oceans energy research in South Africa has dried up over the past two years. Efforts by the South African National Energy Development Institute (SANEDI) to apply for funding for further research have been fruitless despite a considerable amount of advanced research already having been conducted in this space. This issue has had a number of unfortunate consequences. Firstly, the Ocean Energy Industry Association has not been able to get off the ground. Secondly, researchers and students who had been trained in oceans energy work have had to find employment outside of the oceans energy space. Thirdly, opportunities to use oceans energy for commercial purposes such as generating electricity or desalinating water have been negatively impacted.

In addition, more funding needs to be secured for innovation in the maritime space, which currently is difficult to come by.

Nelson Mandela University has a new Ocean Sciences Campus where a number of maritime-related courses are being taught and maritime-related research is being conducted. In addition to the research topics listed in the Road Map, there is also a need for research to be conducted on the following topics:

• A value chain analysis is needed for the maritime sector which should be sector specific but needs to talk to all eight Road Map objectives. Such an analysis would establish the link between the Road Map and industry, who feel disconnected from it at the moment.
• It is important for coastal municipalities to be able to accurately quantify the value of marine and coastal tourism (which they are not currently able to do). This is an area in which more research is needed. Without accurate statistics and research it is not possible to make these local authorities aware of the importance that the maritime sector has for them.
• Research is currently being undertaken to understand how community fishing cooperatives are being
managed and run within communities. The opportunity also exists for these initiatives to be exploited which is why it particularly important that the rights of communities are protected. It is also important to understand the policy mechanisms that exist to support the management and running of these cooperatives and to address any issues that may exist.

- Research should be conducted on the question of whether South Africa’s port are fees really too high compared to other countries and whether this is inhibiting commercial port developments.
- There is a need for more research on South Africa’s ocean space and floor in order to successfully execute aquaculture initiatives in the country.
- Research should also be done one the movement of sand along South Africa’s coast line.
- It is important to pay attention to climate change issues and rising sea water levels and their impact on coastal infrastructure. We also need to guard against inappropriate coastal development. There is an opportunity for research to support planning, “future proofing”/resilience, building methods etc.
- Research should be conducted on how we can ensure that we harness the ocean’s resources in a sustainable manner. Not only does the potential exist for substantial research collaboration on this question, but this need also opens up an opportunity for small sustainability focused businesses to emerge alongside more traditional industries.
- There is a need to investigate what we can learn from other Africa countries and their use of interior water resources such as rivers and inland lakes? Can South Africa harness its own interior water resources and how? A number of insights can be given by CIWSP in this regard.
- The social sciences have not been a part of the bulk of the research and innovation connected to the maritime sector. More social science research is needed and should be integrated into solutions and strategies for the maritime sector. We have to realise that we cannot separate land and sea and we need to manage our human interventions more proactively. Similarly, we need to understand the impact of the ocean and its resources on human settlements more clearly.
- There is also a need for research on how to market African seafarers (i.e. from the continent) to the global shipping industry. What skills should African seafarers have and what skills will they need to meet the changing international requirements of the sector? More research is also needed on the placement and acceptance of South African seafarers in the international community.
- There is a need to obtain a definitive figure for the length of the South African coastline. The number quoted in the Road Map, 3924 km as opposed to other numbers that are quoted, e.g. 3551km, probably includes the Marion and Prince Edwards islands. It would also be interesting to compare the size of the South African land mass to its territorial waters.

The Road Map can be seen as a tool that departments at universities can use to focus their research (such as the topics listed above) and to secure funding. Something that is key for all applied research conducted in the maritime space is that its results need to be directly applicable to end-users, for example, industry or government.

**Applications/projects**

CIWSP has developed an instant response activation programme. This programme includes the South African Police Service (SAPS), the Navy etc. and the response time to attend to an incident is only five minutes. The programme has responded to a number of incidents including drownings, criminal incidents, pollution (e.g. sewage skills).

The “Spread the Love” movement is an international initiative that focuses on people volunteering their time to help anyone with anything they might need. The idea is that if you receive help is that you help someone else in return. This is also something that could be used for people to volunteer to raise awareness and give guidance
about opportunities that can be followed in the maritime sector.

The South African weather service has established a focussed system of wave forecasting called the Ocean Wave Model (ECMWF). It uses swell height and direction and feeds this information into the forecasting system. It can also help to forecast extreme weather events such as tsunamis.

The Ocean and Coast information system is ready for use. It is now possible to monitor every vessel in South Africa’s exclusive economic zone (EEZ) by means of an integrated approach, including the Departments of Defence, Environmental Affairs and Trade and Industry.

FishFORCE, a fisheries law enforcement academy, hosted by Nelson Mandela University and supported by Norwegian funding focuses on combatting sea fisheries crime and related criminal activities.

**Maritime security**

A shift has taken place in terms of the research and general discussions around maritime security both in South Africa and the African continent as a whole. The focus has moved beyond piracy to the notion of the blue economy and the sovereignty of countries constantly being under threat. This is a relatively new development for South Africa as we have relatively straight coastline and have therefore not really been subjected to such threats or concerns about such threats in the past. The shift has therefore been to move from responding to threats to creating the capacity to make the sea a safer space.

There is a problem with illegal fishing in South African waters since we do not have sufficient enforcement capabilities. Little is currently being done in terms of information processing (intelligence).

Ship tracking capabilities should be of interest to many actors in the sectors (for different reasons). The “Silver Mine” system has the information, including the ability to track vessels when transponders (AIS) are switched off, but access to the information is a challenge.

We should consider establishing one entity to coordinate coastal services (rather than having several entities in charge of different elements e.g. the National Sea Rescue Institute (NSRI), the Navy etc.). We also do not have long-range maritime search capability.

There is a need for a maritime safety and security information operations centre. The Navy should play a very different role if we want to optimise national capabilities. We can perhaps start with coordination on domain awareness, with long term objective of integration.

The NSRI functions on a volunteer basis but we may need to start employing people for specific maritime security related services. Other international organisations have a model where highly skilled jobs are filled through appointments and tasks requiring a lower level of skills are carried out by volunteers.

**Policy and regulations**

Good progress is being made with the Marine Spatial Planning Bill which is currently being discussed in Parliament. Under the Marine Spatial Planning Framework all stakeholders have a chance to agree on the best way forward for development. The challenge is that the bill is not clearly linked to the Spatial Planning Act. This is a problem as developments on land impact the coastal and marine environments. The absence of alignment between these three areas of management therefore makes it very difficult to address challenges and opportunities.
In terms of amendments required, there is a need to update the National Environmental Management Act. South African legislation is very good at definitions but problems around alignment and implementation need to be addressed. For example, one should not artificially separate fisheries from aquaculture as it is very important to establish linkages between these two sub-sectors. In terms of implementation, there is now a definite need to move beyond policy development only and to “implement, enforce and police”.

In terms of the need for new legislation, South Africa would benefit from developing a comprehensive maritime security strategy.

A regulatory problem exists around registering ships to the South African flag. This is a costly bureaucratic process with no incentives. If we really want to grow the South African ship register, the process of registering ships needs to become easier and more attractive. Further on the point of ships, we have to address the reluctance of ship owners to register their vessels in South Africa as a national development issue. We will not be able to develop the industry in the manner required if we cannot get this right.

Another regulatory problem refers to the “red tape” that continues to hamper the development of certain parts of the maritime sector, for example tourism and cruise ships. There is a lack of immigration officers at ports and it is impossible to convert one’s maritime visa to a holiday visa which means ship crews are not able to stay on for holidays in South Africa. It should be possible to streamline the different pieces of administration, for example visas, permits, harbor numbers etc., in order to be able to generate revenue for South Africa. This could be done through an electronic port community system as used overseas, but would require the Department of Home Affairs (DHA), the Transnet National Ports Authority (TNPA), SAMSA etc. to buy into it.

While the above points demonstrate the problems of over-regulation, a strong regulatory system can be very important in terms of making South Africa a desirable destination for international vessels, for example to enable us to prosecute those who are evading tax in terms of maritime-related activities or polluting the ocean.

Knowledge management

Knowledge management is about facilitating, sharing and collaboration, in other words, generating the knowledge and then sharing it. It also entails creating a central point for accessing research and information as well as raising awareness about the roles and responsibilities of different organisations. Facilitating collaboration amongst institutions can be beneficial to avoid duplication and to make people aware of what research can be done and where the outputs of such research can be accessed. There is no currently no South Africa-wide maritime directory or “Yellow Pages”, which makes it difficult to find the right people to fill skilled labour positions. We could perhaps learn from the Seychelles or Mauritius, who have been considerably more successful at knowledge management, also by closely involving industry.

Priorities and opportunities

The following 11 opportunities and priorities were distilled from the workshop discussions:

1. Recruit retired former sea captains and other former maritime professionals to assist in upskilling teachers in terms of maritime-relevant information and to teach maritime subjects at schools and universities.

2. Identify what the maritime sector can learn from CIWSP in terms of cooperative governance.
3. Organise a series of targeted theme-specific workshops to discuss how different parts of the maritime sector can take up and implement the Road Map objectives and actions that are relevant to them.

4. Design and distribute a booklet about career awareness in the maritime sector to learners between Grade 5 and Grade 7. Such a booklet would enable them to make informed high school subject choices that would enable them to pursue a career in the maritime sector. Liaise with SAMPA around the booklet for learners they have produced to raise awareness about the maritime sector.

5. Involve local communities in developments in the maritime sector and enable them to benefit from these as well as marine resources.

6. Acknowledge that the Road Map belongs to the sector as a whole, but identify a single custodian/number of key custodians to drive the implementation of its different elements.

7. Develop engineering and technology solutions to support the Small Harbours Development Programme (part of Operation Phakisa). Technology for small harbours infrastructure is considerably different to that for large commercial ports.

8. Explore opportunities around cabotage, especially since our road system is being pushed to limit. Smaller coastal harbours are more efficient in terms of transport and one can cover inland areas more productively because you can create trade corridors.

9. Set up a facility to decommission and break down end-of-life/scrapped vessels in an environmentally friendly way. The scrap metal can then go to Saldanha steel mill.

10. Find ways of making all local dry docks operational and/or consider building additional ones to enable the country to service local vessels and to attract passing vessels for repair, refitting, restocking etc. 12,000 vessels visit South African ports annually and probably even more bypass South Africa while on the South-South trade route.

11. Find ways to connect the South African Weather Service’s (SAWS) technology development training and early warning system service to the rest of the maritime sector so that it can benefit from these services.

The Road Map Implementation Process

The eight key objectives of the Road Map define “what” needs to be done. However, the objectives can only be achieved if action is taken. The following proposed initiatives are three ways in which implementation of the Road Map can continue.

Sector-Wide Engagement

The development of the Road Map followed a broad consultative process (engaging with more than 500 people). The implementation process should continue the broad engagement. This has to date been done by means of the four regional implementation workshops that were held, and the opportunity that was given to all sector stakeholders to comment on the implementation of the Road Map by means of the website that was created for this purpose or by email. Continued sector-wide engagement could take the form of addressing...
some of the priorities and opportunities identified in this document, such as organising theme-specific workshops on the implementation of the Road Map, or focusing on creating awareness about the maritime sector (for example, by producing a maritime focused booklet for learners).

**Supporting Research in Priority Areas**

The Road Map identified several priority areas for research, innovation and knowledge management and specific actions under each objective. This provides clear terms of reference, which can be translated into research plans and actions. The Road Map implementation workshop participants continued to add to the list of important research topics that should be pursued.

While the time frames for research vary according to the topic area, funding support should be for at least five years to facilitate conclusion of the research activities. Partnerships with the public and private sector entities should be encouraged to ensure that the research is relevant and that a pipeline is established for research uptake. Co-funding of the research would ensure ownership, whereas venture capital could be accessed towards the end of the funding cycle. A component of the funding should be focussed on long term outcomes, thus allowing for “blue skies” research. Consideration should also be given on how to communicate blue skies research projects and results to ensure that the value of this research is evident to stakeholders in the sector.

**Post-Graduate Programme**

A considerable number of the research themes identified as part of the Road Map stakeholder engagement process could also be addressed by post-graduate students. In this regard, the coordination of a post-graduate programme aligned with the Road Map objectives would serve to advance research, technology and innovation towards a maritime nation. The Ocean Sciences Campus at Nelson Mandela University in conjunction with SAIMI seems the ideal place to host such a programme.
## APPENDIX A: ATTENDANCE Registers

### 2 June 2017

**CSIR Durban**

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### 1 June 2017

**NMU Conference Centre, Port Elizabeth**

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### Maritime Road Map Implementation

29 May 2017

CSIR Knowledge Commons, Pretoria

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30 May 2017

CHPC CSIR Rosebank, Cape Town

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