# Fostering an Epistemic Shift through Maritime Indigenous and Local Knowledge: A Contribution to Advancing the International Decade of the Sciences for Sustainable Development

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### ABSTRACT

This article examines the transformative potential of indigenous and local knowledge (ILK) within the framework of the International Decade of Sciences for Sustainable Development (IDSSD), as proclaimed by the United Nations General Assembly. By integrating ILK into modern scientific methodologies, the article advocates for an epistemic shift that addresses complex global challenges, particularly in ocean sciences in South Africa. Rooted in indigenous practices and beliefs, ILK offers key insights into environmental stewardship, biodiversity preservation and sustainable resource management. The article underscores the importance of synergistic approaches to knowledge production, emphasising the interplay between 'knowledge for transformation' and 'knowledge of transformation', as conceptualised by scholars such as Lis Lange and Crain Soudien. Drawing on South African higher education's transformation paradigms, the article critiques institutional barriers to radical curriculum change while exploring how decoloniality and critical appropriation can foster inclusive and restorative epistemologies. It highlights the role of ILK as a lever for change, addressing issues of exclusion, dignity, recognition, justice and empowerment. Furthermore, the article situates ILK within broader transdisciplinary approaches advocated by the IDSSD, which call for codesigning and coproducing knowledge systems that bridge scientific silos and embrace cognitive justice. The article concludes by envisioning a humanist approach to knowledge appropriation that transcends racebased frameworks and centres African epistemologies. This approach aligns with the IDSSD's goals to mobilise sciences-including indigenous knowledge systems-toward sustainable development, offering opportunities for epistemic innovation in addressing global challenges such as ocean health and societal well-being.

**Keywords**: transformation paradigms, indigenous knowledge, local knowledge, curriculum development, African epistemologies, coastal communities

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### **I INTRODUCTION**

The International Decade of Sciences for Sustainable Development (2024-2033) (IDSSD) proclaimed by the United Nations General Assembly on 25 August 2023 offers a unique opportunity to harness the power of science to address complex global challenges and ensure a sustainable future for all. This article explores the potential of indigenous and local knowledge (ILK) to catalyse an epistemic shift within the IDSSD framework, particularly in the context of ocean sciences in South Africa. ILK, encompassing the accumulated knowledge, practices and beliefs of indigenous communities, offers invaluable insights into environmental management, biodiversity conservation and sustainable resource utilisation. By integrating ILK into modern scientific approaches, we can foster a more holistic and nuanced understanding of the complex interplay between human societies and the natural world. The article argues that including ILK in the IDSSD provides an opportunity to catalyse epistemic changes for the knowledge production for social and restorative justice and change. The aim of this article is to explore, using a synergistic approach, how indigenous knowledge could shift epistemic discourses and contribute to sustainable development.

The article begins by examining the context and implications of the proclamation of the IDSSD and the call to strengthen the visibility of sciences in combination with other knowledge in reaching the Sustainable Development Goals (SDGs) set by member states of the United Nations (UN) while protecting cultural and natural heritage. As the call is directed at transforming the knowledge production sector in the ocean spaces, the article explores what the transformation of knowledge production might mean in the ocean spaces in the South African context. The article then explores the concept of transformation in South African higher education, drawing on the work of scholars, such as Lis Lange (2014), who discusses two types of knowledge, namely knowledge for transformation, which is the knowledge that needs to be produced to make change possible and knowledge of transformation, which is the knowledge we generate about transformation itself (Lange, 2014:5). Similarly, this article will argue that transformation in

higher education institutions needs to be seen in the interface between knowledge for and knowledge of transformation. While Lange helps to unpack the use of transformation, Jansen (2023:1) assists in developing an understanding of the terms 'decolonisation' and 'decoloniality' as applied to South African higher education. The coupling of Lange's focus on the limits of transformation discourse in South Africa and Jansen's focus on the limits of rhetorical, symbolic and performative politics characteristic of official policymaking, on the one hand, and the social protests movement, on the other hand, provide parameters on how to navigate around the institutional barriers to radical curriculum change. The IDSSD, where indigenous knowledge is seen as a lever for change, should not underestimate the power of institutions to neuter radical ideas.

The article further builds on Crain Soudien's (2021) work on the decolonial moment in South African higher education and its contribution to the conceptualisation of transformation. In the quest for the radical transformation to deal with the issues concerned with and about 'exclusion, dignity, recognition, justice and, critically empowerment' (2021:26). Soudien identified four key positions that have emerged in the South African situation, namely transformation transformation by detachment, bv inclusion, transformation by enlargement and transformation by critical appropriation. In a synergistic approach, the article lays over Lange's typology of knowledge for and of transformation with Soudien's four key positions that have emerged in the South African situation. The article concludes by highlighting that transformation by critical appropriation, advanced by Premesh Lalu (2019) of the Centre for Humanities Research (CHR) at the University of Western Cape, which maintains that "reason" in the modern university has been encoded in the idea of race, or through its proxies such as culture', could assist in the exploration of possibilities of explanations that are yet to come which are beyond race (Soudien, 2021:34-35).

This approach to knowledge appropriation proposes that the modern university in South Africa should be a site for 'inquiring' about what we should desire and whether it is possible to find an alignment between what we desire and what we should desire (Soudien, 2021:36). Desire here, as the animating impulse of the university, is 'to know' (Soudien, 2021:36). The power of humanism's theoretical innovation is its demythologising of the priority of the human and an invitation to think about knowledge differently – less human-centred and certainly in a much broader epistemological scope (Soudien, 2021:37). It is this humanist approach to the decolonial moment and to answer the call of the IDSSD, to think deeply beyond the boundaries of what are thought of sciences, however they are circumscribed and policed. This synergistic approach is futuristic and will provide opportunities for epistemic shifts in providing solutions to the global challenges in the decade of the oceans.

The core of the article focuses on the institutional efforts and policy frameworks that have shaped the development of both ILK and ocean sciences in South Africa. By tracing the historical trajectory and analysing the successes and challenges of integrating ILK into research and policy, the article identifies key opportunities for advancing the transformative agenda of the IDSSD.

# *II THE QUEST FOR SUSTAINABLE DEVELOPMENT*

The United Nations Sustainable Development Summit held on 25 September 2015 adopted the 2030 Agenda for Sustainable Development (2030 Agenda) (UN, 2015). At the summit, heads of state, government leaders and high-level representatives meeting in New York pledged to eradicate poverty-the greatest global challenge-and to promote sustainable development across three dimensions, namely economic, social and environmental, in a balanced and integrated manner (International Institute for Sustainable Development [IISD], 2015). World leaders committed to building on the achievements of the Millennium Development Goals, while addressing their shortcomings. The summit adopted 17 SDGs, envisioned as the blueprint for a sustainable future. However, the 2019 SDG Summit revealed that, while progress was evident in some areas, overall action was insufficient to achieve the goals by 2030 (IISD, 2019). In response, the UN Secretary-General called for a 'decade of action' to mobilise efforts at all levels of society (UN, 2019).

As part of this intensified effort, the UN General Assembly proclaimed the UN Decade of Ocean Science for Sustainable Development (2021–2030) ('Ocean Decade') (see UN, 2017). This initiative seeks to inspire ocean science and knowledge generation to reverse the decline in ocean health and unlock sustainable development opportunities in the marine ecosystem. Guided by the vision 'the science we need for the ocean we want', the Ocean Decade provides a collaborative framework for scientists and stakeholders to advance ocean science and better understand marine systems (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2017).

The ten Ocean Decade Vision 2030 White Papers recognise the important role of indigenous knowledge in the sustainable development of oceans (see UNESCO, 2024). It recommended that the Decade Coordination Unit (DCU) and the newly launched Decade Coordination Office (DCO), which spearheads the Connecting People and Ocean initiative, codesign a theory of change by December 2024 to address the key drivers of Challenge 10 of the White Papers. This Challenge focuses on strengthening society's relationship with the ocean by strengthening meaningful connections, increasing awareness and encouraging actions to ensure a healthy ocean. Regional expertise and multiple knowledge systems, including ILK, are integral to guiding the DCO's strategic direction and fosters collaboration, inclusion and transparency (Glithero et al., 2024). As of April 2025, the DCO has been established and is fulfilling its mandate (see DCO, 2025).

### III IDSSD

The IDSSD proclamation, 25 August 2023, represents a unique opportunity for humanity to leverage the critical role that sciences play in the pursuit of sustainable development in its three dimensions: economic, social and environmental. It serves as a key means of implementation and a response to the complex challenges of our time, aiming to ensure a safe and prosperous future for all (UN, 2023). It is important to note that the preamble to the proclamation acknowledged that humanity faces complex challenges. It emphasised that the full implementation of the 2030

Agenda in all its dimensions requires a more effective and inclusive approach based on the synergistic cooperation of all sciences-basic and applied sciences, and social and human sciences-including indigenous knowledge. This synergistic approach is seen as a key enabler for the development of technology, innovation and education (UN, 2023). The IDSSD views science as important as it is driving innovation and technological changes to tackle global challenges. The IDSSD envisions science as driving the search for solutions to complex problems facing the globe. Sciences are seen as a compass, pointing towards reaching the SDGs. In calling for change in lineal scientific approaches, the IDSSD is a call to action for scientists and society to combine sciences and other knowledge on various scales, beginning with the village, district, country and global level, in order to attain sustainable development.

The IDSSD is premised on transdisciplinary approaches, going beyond the view that science is the only viable knowledge system with solutions to the immense challenges. (UN, 2023). To address these problems, we need to move to a more complex process of problem formulation that embraces all the sciences, including citizen science and indigenous knowledge systems (IKS). Transdisciplinary approaches are rooted in concepts of codesign, coproduce and comanage knowledge production policies (UN, 2023). These approaches offer a means of overcoming the knowledge silos and chasms in science and society (IIDS, 2023). This calls for sciences to be conducted in a different way, treating ILK as integral rather than as an add-on (UN, 2023). We need to build a science for action based on universal values of justice and cognitive justice, where all voices are heard, leaving no knowledge system behind (IISD, 2023). Finally, we must ensure that there is a connection between sciences and policymaking at different levels of decision-making (UN, 2023).

### IV THE TRANSFORMATION PARADIGMS IN HIGHER EDUCATION

Lange (2014:2) argued that since the early days of the democratic transition in South Africa "transformation" as a concept has lost its intellectual, political and moral content through becoming institutionalised. In order

to undo the institutionalisation of transformation, it is necessary to explore its relationship to two types of knowledge: knowledge for transformation and knowledge of transformation.' Similarly, this article argues that transformation at higher education institutions needs to be seen in the interface between knowledge for and knowledge of transformation. In examining the use of the concept of transformation in initiating the radical change posed by the IDSSD, one should pay attention to the caution raised by Jonathan Jansen (2023:1) that 'the role of the social scientist especially in times of national crisis is to be sceptical of new words or terms as they emerge in public discourse'. While Lange helps to unpack the use of transformation, Jansen assists in understanding the terms decolonisation and decoloniality as applied to South African higher education. The coupling of Lange's focus on the limits of the transformation discourse in South Africa and Jansen's focus on the limits of rhetorical, symbolic and performative politics characteristic of official policymaking, on the one hand, and the social protests movement, on the other hand, provide parameters on how to navigate around the institutional barriers to radical curriculum change. The IDSSD, where indigenous knowledge is seen as a lever for change, should not underestimate the power of institutions to neuter radical ideas. It will not be a free ride just because the call has come from the UN. The International Council of Sciences supports it and UNESCO is implementing it.

The decolonial moment in higher education in South Africa occasioned by the #RhodesMust Fall (#RMF) and the #FeesMustFall student protests between 2015 and 2017 also sharply brought the intellectual legitimacy of universities *sharply* in focus. The student protests problematised the university's 'colonial' character and particularly its deployment behind the epistemological and ontological project of global whiteness. Crain Soudien (2021) summarises this event succinctly by saying that '[t]he students challenged the university's relevance for themselves as black people and for the project of social development'. They questioned its ability to name and confront inequality and exclusion. It had failed them and required radical transformation. In the quest for radical transformation to deal with the issues concerned with and about exclusion, dignity, recognition, justice and empowered, Soudien (2021:26) identified four key positions that had emerged in the South African situation, namely *transformation by detachment, transformation by inclusion, transformation by enlargement* and *transformation by critical appropriation.* Soudien (2021:29) provides a summation of the fundamental propositions of the decolonial movement as they relate to the politics of knowledge to deal with the sciences for sustainable development as follows:

- reject the marginalisation of the African voice
- reject the positioning of Africa as a place to learn about and not from (Hendricks & Leibowitz, 2016)
- reject the objectification of Africa as a site for Western scrutiny (Garuba, 2015; Kamanzi, 2016).

These propositions see the founding of universities in Africa as dedicated to erasing indigenous culture and note that the teaching of European forms of rationality was inseparable from the imposition of the juridical framework of European commerce and of the European bureaucratic state apparatus (Soudien, 2021:29 citing Habermas, 1987:2). It is, therefore, a rejection of modernity as a rationale that could lead to the restoration of the human dignity of modernity's other. This view sees Western education, by design, as being implemented to oppose African philosophy, hence the need for African universities to centre African epistemologies in African higher education (Soudien, 2021:30).

### V APPLICATION OF THE TRANSFORMATION PARADIGMS TO FOSTER EPISTEMIC SHIFTS IN HIGHER EDUCATION

So far, this article has highlighted four paradigms focusing on the transformation of the politics of knowledge production that could assist in configuring the role of indigenous knowledge in the imagined future of the university. This article will attempt to historicise the way in which dominant forms of transformation paradigms have contributed to or stifled the transformation of the politics of knowledge production in higher education.

Lange (2014) posits that there are two types of transformation knowledge, namely knowledge of transformation, which is the knowledge that we need to produce in order to make changes possible, and knowledge of transformation, which is the knowledge we generate about transformation itself. The objective of the knowledge *for* and *of* transformation is to effect change in society. In this article, we will historicise the knowledge for and of transformation and the relations between them by focussing on the role of the Department of Science and Technology (DST), later renamed as the Department of Science and Innovation (DSI), in the transformation of the politics of knowledge production in higher education.

### Transforming the national system of innovation

Governments have a number of clearly defined roles and responsibilities to ensure that science, technology and innovation (STI) priorities in a country are addressed effectively and efficiently. This aspect of the role of government in addressing science, technology and innovation within the STI system fits the category of knowledge of transformation. The South African government published the 1996 White Paper on Science and Technology to strengthen and transform the STI system (Department of Arts, Culture, Science and Technology, 1996). The National Research Development Strategy (NRDS) and the Ten-Year Innovation Plan (TYIP) were the instruments used for the implementation of the 1996 White Paper's broad vision and framework of STI activities. The conceptual framework provided by these documents shows an attempt at specifying the notions of and practices of transformation of the STI (DST, 2002). The NRDS and the TYIP were concerned with establishing the priorities, objectives, targets and timeframes for achieving discrete goals and objectives. This was an attempt to translate transformation into policy implementation in STI. This process gave credence to the institutionalisation of transformation in the STI system in South Africa. The underlying premise of the NRDS and TYIP is simple: invest in and nourish and expand those scientific fields where South Africa has a comparative strength in terms of human resources, accumulated knowledge and scientific infrastructure. As such, both documents identified fields such as astronomy, palaeosciences, IKS, biodiversity, infectious diseases, deep mining and other 'strong' fields, such as marine, coastal and Antarctic studies.

## *Knowledge of transformation and the institutionalisation of the IKS*

It is significant to note that the priority areas chosen in the NRDS included sciences, both basic and applied sciences, ocean sciences and indigenous knowledge. In 2004, the Indigenous Knowledge Systems Policy was published, providing a roadmap for the development and mainstreaming of IKS in STI (DST, 2002; DST, 2004). Between 2002 and 2019, two major pieces of legislations with significant implications for the development of IKS in the country were enacted, namely the National Environmental Management Biodiversity Act, which was passed in 2004, and the Protection, Promotion Development and Management of Indigenous Knowledge Act, which was passed in 2019. These two pieces of legislation transformed the legal framework for protecting the environment and indigenous knowledge in the country. At the institutional level, the NRDS and the TYIP created new institutions for developing biodiversity and indigenous knowledge, namely, the South African National Biodiversity Institute (SANBI) and the National Indigenous Knowledge Systems Office (NIKSO).

NIKSO further institutionalised IKS by implementing instruments for human capital development, such as research chairs at the University of Fort and the University of South Africa (Unisa), and also created an IKS centre that was later converted into a Centre of Excellence for IKS at the University of KwaZulu-Natal. NIKSO was also proactive in establishing the bioprospecting platform, focusing on traditional medicines and supporting investment infrastructures in laboratories at the Council for Scientific and Industrial Research and the Medical Research Council (MRC). In the area of knowledge management, NIKSO established 10 IKS recordal centres spread throughout the nine provinces of the country, with a group of young people recording indigenous knowledge on medicines and indigenous food (see Balogun, 2023). The knowledge of transformation and the knowledge for transformation experienced some overlaps. For example, the setting up of the Bachelor of Indigenous Knowledge Systems at the University of Venda and North-West University produced both knowledges contributing to the generation of knowledge and the skills needed for transformation. The South African Research Chairs Initiative (SARChI) chair at the University of Fort Hare University was specifically dedicated to the systematisation of indigenous knowledge to provide knowledge for transformation, the knowledge that will go a long way in advancing epistemic discourses and shifts.

A great deal has been done in the area of producing knowledge of transformation in the field of indigenous knowledge. The efforts of and funding from the DST led to the institutionalisation of IKS at various universities. The institutionalisation of transformation in IKS also saw its entrance into the administrative logic of the state machinery. It contributed to the department's key performance indicators. From this perspective, the transformation of the sector needed to be measured, benchmarked, multiplied, squared, divided, exhibited in graphs and pie charts, and monitored and reported on quarterly and annually. Using metrics to measure performance was conceptualised as a necessary activity to assess the value of the money invested.

In focusing on the knowledge for transformation, one notes that the department made an important investment in funding the research enterprise through the National Research Foundation (NRF). The NRF Act mandated that the NRF consider IKS as one of its priorities. The formulation of the mandate compelled the NRF, with DST funding, to invest in research chairs. For a number of years, the NRF maintained a research fund for IKS that promoted knowledge generation. However, the funding of IKS research met with some institutional resistance from the epistemic community and was stopped. Many of the research projects failed to meet the criteria for IKS. This led to a deficit in knowledge production for transformation, therefore, the production of knowledge needed to shift epistemic discourses. The two chairs in IKS were also discontinued for the alleged failure to meet the criteria of the NRF, after evaluation by non-experts in IKS. The criteria used for the assessment of the performance of IKS instruments was based on criteria that were formulated for dominant forms of Western knowledge and, hence, failed to see the value of IKS. The research work that the Chair at Unisa had done on IKS and Development Education was of such quality that it began to move the needle in the transformation of the epistemic landscape in the country. The IKS chair at Unisa became a dynamic network of IKS scholars. The annual research conversations between academic and organic intellectuals attracted global scholars from all over the world. However, this Chair was assessed as performing below standard as a result of the institutional resistance to transformation in the STI. Sometimes transformation produces contradictory results owing to institutional and professional conflicts.

In summary, what started as an intent to promote worldclass science in the IKS field over the years morphed into science-led missions with an increasing focus on technology development and commercialisation to produce socioeconomic outcomes (Mouton et al., 2020:17). The National Advisory Council on Innovation (NACI) review has shown that the specific focus on these fields has produced demonstrable gains in scientific knowledge output, human resource capabilities and infrastructure but probably not sufficient to provide a foundation for the knowledge for transformation, knowledge that could contribute to the epistemic shifts envisaged by the IDSSD.

## Knowledge of transformation and institutionalisation of the ocean sciences fields

The second area of focus to historicise the efforts at transformation is that of the marine, coastal and Antarctic studies as part of the geographical advantage areas. This area becomes pertinent to this discussion as it is the root base of the intervention for this article: to examine how the phasing of ILK in the maritime sector could also cater for its transformation in line with the International Decade of Science and the Decade of the Oceans. The NRDS and TYIP chose to prioritise oceans as one of the geographical advantage areas in which the country should promote excellent science. The South African government planned to use the potential of the ocean economy to address the challenges of poverty and inequality. South Africa is uniquely bordered by three oceans. With the inclusion of Prince Edward and Marion islands in the Southern Ocean, the coastline is about 3 924 km long (Department of Environmental Affairs [DEA], 2014). South Africa is also located along one of the busiest shipping routes, making it an ideal halfway station to international trade (Venter, 2018; Ncube & Lufumpa, 2017).

In keeping watch over the knowledge of the transformation of the oceans sector, we turn to the joint efforts of the DST and the DEA, now called the Department of Forestry, Fisheries and Environment (DFFE). This field of study was not mentioned in the 1996 White Paper on Science. The process of institutionalisation of the sector commenced in 2002, when the 'Antarctic, Islands and Oceans' was one of five science focus areas identified in the NRDS for long-term action. In 2003, the cabinet approved the transfer of the scientific research functions of the already established South African National Antarctic Programme (SANAP) from the then Department of Environmental Affairs and Tourism (DEAT) to the DST, with the NRF becoming the agency responsible for grantmaking on behalf of the department. In 2005, the DST drafted the Antarctic Research Strategy for South Africa (ARESSA).

The 2008 TYIP continued the NRDS focus on this field of scientific research, referring to 'Antarctic, Southern Ocean and marine science' as part of its Global Change Grand Challenge (GCGC). In 2011, the DST started working on a new Antarctic strategy and research plan, which was never approved. In 2014, the DST's National Marine Research Plan for South Africa, 2014+ and the NRF's South African Antarctic and Southern Ocean Research Plan 2014-2024 were published. The vision of the strategy was to 'build the national marine and Antarctic research system to develop human capital; maximise South Africa's international profile for research in this domain; bring about transformation in the sector; and contribute to innovation and economic growth around the oceans economy' (see DST, 2014; NRF, 2014). Several activities were devised in the implementation of the South African Marine and Antarctic Research Strategy (MARS) such as, for example, the African Coelacanth Ecosystem Programme, which subsequently morphed into several platforms that include infrastructure; the Southern Ocean Carbon and Climate Observatory (SOCCO); the Agulhas System Climate Array established within the South African Environmental Observation Network (SAEON); research bases on Gough Island, Marion Island and SANAE IV (Vesleskarvet, Queen Maud Land); the polar research and supply vessel, the SA Agulhas II; and a new ocean robotics facility at the CSIR as part of SOCCO. Seven SARChI chairs in related sciences have been established since 2000. In 2014, as part of the implementation of the National Development Plan, Operation Phakisa: Ocean Economy was launched with the key purpose 'to maximise the socio-economic return accruing from South Africa's proximity to massive ocean resources' (DST & DEA, 2016:2).

As part of the institutionalisation of Operation Phakisa, South Africa set up a special institute to drive a pro-blue economy programme. The South African International Maritime Institute (SAIMI) was launched to assist the government and other partners in coordinating maritime education, training and research nationally (DEA, 2014). The vision of SAIMI is to serve as a lead partner in providing education and training, skills development and innovation. SAIMI is hosted by Nelson Mandela University (NMU) and the university has developed a range of marine and maritime education and training, research, innovation and engagement programmes to support the country's blue economy. In 2017, NMU launched a dedicated Ocean Sciences Campus, the first of its kind in the country. Other structures supporting the university's ocean sciences include the Institute for Coastal Marine Research (Walker & Johnston, 2019).

The sustainability and competitiveness of the blue economy was, at one moment, described as the new frontier of the African renaissance. There are other instruments at the continental and national levels, such as the Oceans Master Plan, that aim to boost the blue economy across the continent and nationally, which aligns with SAIMI's work. These instruments recognise the importance of Africa's oceans in transforming its economies. Despite this recognition of the importance of Africa's oceans in transforming its economies, SAIMI noted that there was, however, a fragmented approach to transformative ocean governance of the human activities by ocean users, including those between the industry and academia, public and private sectors, technical organisations, governmental institutions and civil society that hinders the delivery of an integrated and multidimensional ocean economy at a regional and national level (see Chasomeris, 2018).

SAIMI's response to the urgent need for meaningful engagements on a fragmented approach to transformative ocean governance by the users was to come up with SAIMI as a think tank. In line with the SAIMI's mandate of research and advocacy, the organisation is being positioned as a leading think tank in the ocean domain, which includes but is not restricted to the maritime sector. The think tank aims to contribute to knowledge generation, policy development, engagement and capacity building within the ocean space.

The SAIMI think tank currently has six thematic workstreams, namely:

- 1. cyber security
- 2. ocean governance
- 3. offshore oil and gas
- 4. oceans economics
- 5. maritime education and training
- 6. maritime ILK systems.

In developing the research agenda for each SAIMI think tank workstream, the research experts decided that a consultative approach would need to be taken.

Some of the objectives of the SAIMI think tank include:

- Providing a platform for thought leaders, policy analysts, researchers and other relevant stakeholders to exchange ideas and generate research and evidence-based policy recommendations.
- Contributing to shaping the country's strategic vision and the wider African region around ocean policy issues.
- Creating a body of knowledge on ways in which South Africa's ocean policy is affected by geostrategic, economic, ecological (climate), social, territorial and cultural factors.

• Maritime research capacity building locally and regionally.

Since its establishment, the Maritime ILK workstream has worked with the NMU academic community to explore the consolidation of NMU's strength in ILK. The exploration for consolidation of the interest in IKL was a collaborative initiative at the university, leading to the creation of a university-wide indigenous knowledge platform. This platform, which was central in the partnership with the other three universities in the province in organising an international interdisciplinary IKS conference held in August 2024.

This SAIMI contribution is a clear commitment to placing IKS-based research high on the knowledge agendas of the universities in the region. SAIMI is a national institution that plans to extend its footprints to other universities in the country. SAIMI has signposted its intentions to undertake impactful research in various sectors of the blue economy. SAIMI also wishes to project its approach to the creation of a research agenda that is integrated, multidimensional and interdisciplinary.

The Institute for Coastal and Marine Research (CMR) is a leading ocean and coastal sciences research entity of NMU, based on the Ocean Sciences Campus. The CMR is a university-wide research and engagement institute that reports directly to the Deputy Vice-Chancellor on Research, Innovation and Internationalisation. The institute strives for excellence in transdisciplinary research and spans across all seven NMU faculties, while including members from external national and international entities. The CMR boasts five research chairs in:

- 1. Law of the Sea and Development in Africa
- 2. Marine Spatial Planning
- 3. Ocean Cultures and Heritage
- 4. Ocean Science and Marine Food Security
- 5. Shallow Water Ecosystems.

The CMR has a rich depth of scholarship and scholars in a broad number of fields. It has a long ocean and coastal marine research and engagement history at NMU. It comprises a multi-disciplinary complement of staff and postgraduate students across all seven faculties of the University, including research associates, collaborators from external research entities and local and international collaborators.

We have attempted to historicise the knowledge of the transformation of ocean sciences in South Africa by outlining the national processes resulting in the institutionalisation of the ocean sciences in South Africa. We commenced with the history of the policy landscape for the marine, coastal and Antarctic studies in South Africa. MARS published by the DST and the DEA in 2016, and its associated draft implementation plan prepared by the DST has been the main roadmap for the development of the sector. It is clear that the MARS became the country's only register for transformation in the sector. This approach meant that the transformation of South Africa's ocean sector was narrowed down in the policy texts and, in the corresponding implementation strategies, to the transformation of the higher education and the national system of innovation, without keeping an eye on the structural conditions that could accelerate, slow down, halt or make impossible social transformation with any depth. The need for accountability in the system meant that transformation had to be measured and demonstrated. In the process of creating metrics for accountability, transformation has been reduced to numbers, percentages and ratios of black and white people and, to a lesser extent, men and women. A number of variables did not make it into the statistical analysis simply because quantitative evidence is comparatively easier to collect and work with, and is amenable to becoming a system-level data set that provides comparable measurements and helps to set time-bound performance targets for the department and its institutions.

## *Knowledge for transformation and the oceans sciences*

Given the colonial and apartheid past in the country, measuring transformation was reduced to measuring equity. As much as it is valuable as metrics or indicators of transformation, this performance-oriented approach often leads to hiding the institution's inability to interrogate transformation itself. As Lange puts it,

'performance-oriented transformation does not deal with complexities of social, organisational or personal change' (Lange, 2014:4). While quantitative evidence is necessary for measuring the attainment of targets that constitute transformation, what intellectual, political, and moral bases remain unattended in different institutions? The NACI review of the NRDS and the TYIP revealed the truncated approach of the performance-led transformation. While the TYIP placed the implementation of the MARS under the Global Change Grand Challenge of the TYIP, the reporting of the performance remained fragmented and operated in silos, with the directors of both the Marine and Antarctic Sciences and of the Global Change Grand Challenge reporting separately to the chief director of Science Missions on similar metrics, without questioning the silo and fragment approach to the nuances of transformation.

At the institutional level, SANBI works in the ocean space and the South African Environmental Observation Network (SAEON) was run and reported differently under the mandate of the DFFE for SANBI and the NRF for SAEON (Walker & Johnston, 2019). Still, they used the same system of innovation. This fragmented approach was more manifest in managing the state-of-the-art research vessel, the Agulhas II. Researchers conducting research in the Southern Ocean and in the Antarctic were funded under the DSI with funds from the NRF, while the DSI also paid for the cost of the Agulhas II voyages for research purposes. However, it was often the case that the scheduling and management of the Agulhas II by the DFFE was at variance with the researchers' timetables and schedules. As far as could be determined, no reviews of the various marine and Antarctic-related strategies and research plans have been conducted. However, the academic community has provided some insights in articles published in the South African Journal of Science.

From an examination of these articles, we can highlight that one challenge associated with implementation is related to a lack of coordination between the designated government agencies. A case in point is the ongoing criticism from scientists and scholars over a lengthy period of time of the availability of scientific time on the Agulhas II. There was only limited DST involvement in decisions concerning the availability and accessibility of the state-of-theart research platform for one of its main groups of end-users (ie researchers at academic institutions and science councils). Of further concern was the fact that the timing for approval of research proposals and the deadline for applying for ship time differed between academic institutions, science council scientists and government departments. This difference resulted in a split mandate in the management of Southern Ocean Sciences. The misalignment in communication and purpose between the two government departments tasked with overseeing and supporting the use of the SA Agulhas II for South African science and logistics was having a negative impact on research.

Consequently, DST's goal of increasing South Africa's contributions to Southern Ocean and climate change science was being compromised (see Mouton et al., 2020:145; Treasure et al., 2013). Given this account, performance-led analysis of transformation remains on the surface of the quantitative evidence and effecting change in the system becomes difficult.

Transformation in 2024, with the proclamation of the IDSSD, has to be conceptualised differently from the time when the need for access and redress called for the change in the nature of society that clearly wanted to make a break from its apartheid past. Today, the conceptualisation of transformation calls for a change in the subject, the object, the means and the objectives of transformation, and the inclusion of the social-cultural and pedagogic institutional spaces. It should become imperative that the nature of transformation called for in the IDSSD and in the Decade of the Oceans is contextual and dynamic, and requires a redefinition of transformation.

The Ocean Decade supports the principle that transformative ocean science needs to be codesigned and codelivered in a multistakeholder environment, and needs to involve the generators of knowledge and the users of knowledge and embrace local and indigenous knowledge holders. It is key to recognise, respect and engage local and indigenous knowledge holders to tackle the ocean challenges. The IDSSD and the Decade of the Ocean both call for the enhancement and expansion of the identification of the required knowledge for sustainability and increase the capacity of ocean sciences to deliver the needed solutions to today's and tomorrow's global challenges (UNESCO, 2024b).

The call for codesign, coproduction and multi- and interdisciplinarity to create the 'Oceans We Want' calls for the breakdown of disciplinary boundaries and departmental mandates, and the seeking of collaborative and new ways of knowledge creation in the South African context. At the DSI, the White Paper and its implementing instrument, the Decadal Plan, highlight initiatives to expand and transform the human resource base of the NSI, and to strengthen and transform the research enterprise. In these respects, the aim of the Decadal Plan is to develop greater synergies between the DSI programmes and the Department of Higher Education and Training – placing education and skills development at the centre of STI policy.

Like the IDSSD, the Decade of the Oceans and the Maritime ILK workstream, the Decadal Plan embraces transdisciplinarity. In the context of these policy frameworks, transdisciplinarity entails research efforts conducted by investigators from different disciplines working jointly to create new conceptual, theoretical, methodological and translational innovations that integrate and move beyond discipline-specific approaches to address a common problem. A critical defining characteristic of transdisciplinary research is the inclusion of stakeholders in defining needs and, hence, research objectives and strategies. At the policy level and the institutionalisation of transformation, the enablers are already in place. At NMU, the Institute for Coastal Marine Research already embraces transdisciplinarity as a methodology for knowledge production (Chasomeris, 2018).

Given the intellectual endowment of the NMU, with two research institutes hosted by the NMU, five SARChI chairs and the various strong disciplinary fields such as the social and natural sciences, and the Transformation and Engagement Office's seven knowledge hubs, the NMU is positioned to enter a new era of knowledge production in partnership with societal stakeholders such as industry, business and indigenous knowledge holders (NMU, 2023). However, there is need to intensify efforts to coordinate and monitor the traditional and institutional culture, which are the ethnographical language that encapsulates subtle but important variations in the manner in which history, memory, behaviour and thinking can combine and manifest themselves at different structures within the university. To leverage this competitive advantage of strong institutions, it is necessary for the researchers and the research to undertake self-examinations in order to eliminate barriers to working towards a new imagined knowledge platform in the university. The Maritime ILK workstream and the Nelson Mandela IKS Platform are new players in the knowledge politics of NMU. They need to tread carefully when they chart their contribution to meeting the challenges of knowledge production pronounced by the IDSSD, the Decade of the Oceans and the DSI Decadal Plan to create new conceptual, theoretical, methodological and translational innovation that integrate and move disciplines-specific approaches to address a common problem.

Knowledge for the transformation requires knowledge about the renewal of knowledge that is critical and open to debate in terms of the potential to transform social practices. In this new knowledge enterprise, we should avoid simplistic versions of transformation that would legitimise unexamined, self-satisfying and essentialised knowledge, whether Eurocentric, postcolonial/decolonial- or IKS-framed. Because of the failure to exchange between disciplines and seek collective solutions in novel ways, knowledge of knowledge for transformation is perceived from the disciplinary prisms. Knowledge for transformation is vital for substantive changes in the nature of knowledge itself. This means that the time to undertake appropriate research for change is required for new projects such as the maritime ILK, and the project cannot be rushed. However, with the barriers such as lack of funding for research and the lack of human capabilities to undertake complex research, the projects could fail because of the absence of strategic knowledge for change. Care must, therefore, be taken to grow the timber for the production of knowledge for transformation. Maritime ILK must establish an enabling system to weave together a formidable team built on deeply researched themes that would earn respect from the varied participants and stakeholders. To build a dynamic and transdisciplinary network of researchers and knowledge holders to produce legitimate knowledge to shift the epistemic landscapes in answer to the IDSSD, it should be committed to an ethical approach to working with all the stakeholders through establishing the following guiding principles:

- Free, prior, and informed consent (FPIC): This will ensure that ILK is shared in a non-extractive and respectful way. Maritime ILK will firmly adhere to the FPIC principle when working with indigenous knowledge holders.
- Adherence to FAIR and CARE data practices: The FAIR (findable, accessible, interoperable and reuse) and CARE principles for indigenous data governance (collective benefit, authority to control, responsibility and ethics) should be respected.
- Codesign, coproduction and co-dissemination: Maritime ILK workstream promotes the development of codesigned and codelivered ocean science that encourages indigenous and local communities' (ILCs) involvement in relevant research and action projects.
- Inclusive capacity exchange and benefit to ILCs: Capacity exchange reflects the need to ensure that the ILC contribution to knowledge generation experience the benefit from it and ensure gender and intergenerational equity.
- Minimising duplication of efforts: The approach that we intend to embark on will ensure that the ILC representatives are not overburdened by the demands coming from multiple ocean science stakeholders at NMU. As we have noted, the university has a large number of academic stakeholders who might wish to engage the ILK communities. Maritime ILK is currently consulting the epistemic community at NMU on the planned SAIMI symposium with traditional leaders and indigenous knowledge holders in the Eastern Cape province. Maritime ILK, via the Indigenous Knowledge Platform, has identified university participants to be encouraged to join their requests and work together to limit the duplication of engagement efforts.

• Accountability: Maritime ILK is committed to establishing mechanisms to deliver on its promise to embrace ILK. Maritime ILK has already scheduled a workshop on monitoring and evaluation to explore the theory of change and equip its stakeholders in the process of setting up monitoring and evaluation processes, resource mobilisation, gap analysis, and facilitating entry points in the research projects.

# *Contribution of indigenous knowledge to sustainable development*

A review of the literature revealed that a contextual and methodological gap exists relating to indigenous knowledge in sustainable development (Jakes, 2024:41). Jakes's work reveals that indigenous knowledge is crucial for sustainable development, offering valuable insights into resource management, biodiversity conservation and climate change adaptation. Jakes indicates that, despite recognising indigenous knowledge as a vital component of sustainable development, there remains a significant gap in understanding the specific mechanisms by means of which indigenous knowledge can be integrated into modern sustainability practices and policies (Jakes, 2024:46). The dearth of work on how indigenous knowledge can contribute to sustainable development emphasises the need for integrating indigenous knowledge into sustainability theories based on its holistic approach. By recommending a systems-based perspective the maritime ILK focus has the potential to contribute to the theoretical models by offering practical insights by showcasing the successful application of indigenous knowledge.

### **VI CONCLUSION**

A return to Soudien's engagement with the Southern Decolonialists who: (i) reject the marginalisation of the African voice; (ii) reject the positioning of Africa as 'a place to learn about and not to learn from'; and (iii) reject the objectification of Africa as a site for Western scrutiny, and call for the urgency of recognising and according value to the knowledge of the previously disadvantaged, has become contentious in how the idea of being human should be engaged with or how the universities could be transformed. Soudien postulates that this contention has produced two distinct approaches. The first is described as transformation by detachment, while a second strand, labelled as an African humanist, contains three sub-strands, namely transformation by inclusion, transformation by enlargement and transformation by appropriation.

#### Transformation by detachment

The transformation by detachment is located in the student protests of 2014 to 2017, during which the students maintained that all the institutions of colonialism, the schools and the universities in the main, were irredeemably tainted by their histories and that what was required is a complete break from them. In the process of historicising the institutionalisation of indigenous knowledge it should be stated that the policy language was never that of detachment. Beginning with the 2005 outcomes-based curriculum, it was never about developing IKS in the curriculum as a detached knowledge from the tainted curriculum. The IKS policy never conceived of a focus on developing IKS as a separate process within the universities, science councils or society.

#### Transformation by inclusion

The transformation by inclusion scholars have been concerned a great deal more with decolonisation and they are fiercely critical of colonialism. Conversely, 'the Detachment position, Inclusionists like Mbembe, make clear that they are not against European knowledge' (Soudien, 2021: 32). They maintain that European knowledge contains, within itself, the resources of its own refutation, and that European knowledge can allow 'us to see ourselves clearly, always in relationship to ourselves and to other selves in the universe, nonhumans included' (Soudien, 202:32). Education or transformation by inclusion was the approach adopted by the developers of the outcomes-based curriculum. They did not mind borrowing the curriculum methodology from Australia and implant it into South Africa. When it came to indigenous knowledge, the process was to include it in other subjects and not introduce it as a stand-alone subject.

### Transformation by enlargement

Transformation by enlargement was championed by Odera Hoppers, a distinguished scholar of indigenous knowledge at Unisa, SARCHi Chair at the Centre for Development Education. She was concerned with the issue of the marginalisation of indigenous knowledges and the importance of integrating displaced knowledge into the repertoire of knowledge traditions that are available in the world. Her criticism of Western knowledge was the conceit with which it constitutes the answers to the world problems. She was a champion of cognitive justice as preferring a democracy of all knowledges where they would all blossom. The IKS epistemic community would gather annually at Unisa for workshops and conferences focusing on IKS as the lever for the transformation by enlargement. The DST, as policymakers, extended invitations to these conferences to ministers to give keynote speeches. The centre became the IKS epistemic Mecca, bringing together indigenous knowledge holders as organic intellectuals enjoying the same standing as the academic scholars. This trend allowed IKS to evolve as an independent field of scholarship, on its own merits and with its own scholars, allowing for the codesign and coproduction of knowledge. It was an exciting experiment in knowledge production that was multidisciplinary and interdisciplinary. Following in its footsteps was the development of the Bachelor's degree in Indigenous Knowledge as a stand-alone degree programme first introduced at the North-West University and currently offered at University of Venda. It was this moment of the dynamic environment that created partnerships that built incredible networks. The establishment of the African traditional medicine laboratories at the MRC and the University of KwaZulu-Natal followed through this tradition of transformation by enlargement. It has certainly been a methodology that stretch the IKS footprint to all universities in the country as evidenced by the recent International Interdisciplinary IKS conference hosted by the NMU. It heralds the success of mainstreaming IKS in the NSI and in higher education

### Transformation by critical appropriation

However, the third strand of the humanist approach to the decolonial moment is transformation by critical appropriation advanced by a scholar Premesh Lalu of the University of Western Cape's Centre for Humanities Research. The central argument is that the modern university is trapped or marred by a seemingly 'intractable epistemic impasse (Soudien, 2021:34.) Lalu argues that reasoning 'in the modern university has been encoded in the idea of race, or through its proxies such as culture' (Soudien, 2021: 34-35). The contribution of the CHR is to explore the possibilities of explanations that are yet to come. These are beyond race. They pivot on making the modern university in South Africa a site for 'inquiring' for what we should be desiring and whether it is possible to find an alignment between what we desire and what we should desire. Desire here as the animating impulse of the university is 'to know'. But when knowing is encoded in 'race' or 'racial knowing', the university is trapped in the coils of dominance. The southern university, Lalu argues, must break the impulse (Soudien, 2021: 36). The work that remains to be done is not simply the issue of access but, the modes of reasoning typified by the modern university.

The power of the humanism's theoretical innovation is its demythologising of the priority of the human and an invitation to think about knowledge differently less human centred and certainly in much broader epistemological scope (Soudien, 2021:37). This suggests not simply the need for transdisciplinary but also the necessity of thinking beyond the boundaries of what are thought of as 'western', 'southern' or however else the boundaries of knowledge are circumscribed or policed. The call to you all from the African humanists is that we should learn in wide and deep ways, learn through exposing ourselves in many ways of knowing as possible (Soudien, 2021:38).

It is this humanist approach to the decolonial moment and to answer the call of the IDSSD, to think deeply beyond the boundaries of what are thought of sciences, however they are circumscribed and policed. It is this approach to knowledge production that we would promote and embrace the new possibilities to enlarge the boundaries as we explore how the inclusion of IKS in the Decade of Ocean and the Decade of the Sciences for sustainable development.

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