DOSI
DEEP-OCEAN STEWARDSHIP INITIATIVE

POLICY BRIEF
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The Necessity of Traditional Knowledge for Management of Deep-Seabed Mining

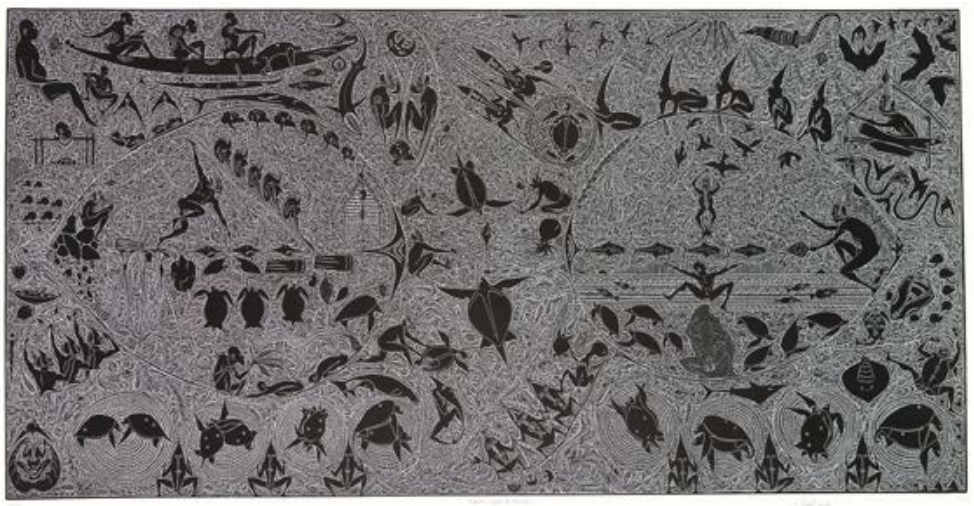

*Fig 1. An interpretation of the cycles of life at sea is illustrated here. Photo courtesy: Alick Tipoti, "Wadth, Zigin Ar Kusikus", linocut, 102 x 201 cm, 2005 © Alick Tipoti/**www.artsdaustralie.com**.*

What is traditional knowledge (TK) as it relates to the deep sea?

Although there is no universally accepted definition of 'traditional knowledge' in international law and environmental governance, we refer here to TK as ***the knowledge, innovations and practices developed from experience gained over the centuries and adapted to the local culture and environment***. It may be collectively owned and passed down through millennia in the form of stories, songs, chants, folklore, proverbs, dances, paintings, cosmologies, cultural values, beliefs, rituals, community laws, local language, and practices. TK helps transmit identity, relationships among peoples, with ancestors and with the environment. For the deep sea, TK is manifested in the preservation and perpetuation of connections between people, species, processes, ecosystems and seascapes. This includes an explicit approach for effective environmental management.

Importance of Indigenous Peoples and Local Communities (IPLCs) as resource custodians in environmental governance practices

Many IPLCs have a deep connection to the ocean and rely on ocean resources. They consider themselves resource custodians and principal rights holders rather than stakeholders, and may have their own customary decision-making processes. TK embodies cultural and spiritual values associated with the natural environment and an important and respectful interaction with Nature. This has led to a Universal Declaration on the Rights of Nature, with a shared vision for collective action on global challenges. Community territory and property rights have extended to the sea in a habit of sustainable management of marine resources over generations (Pratt and Govan, 2010). Maritime cultures often traverse territorial boundaries to form fluid and mobile networks with little adherence to demarcations drawn by administrators or conservationists (Actona et al., 2019). However, present use, historical tenure and indigenous group access can be included in marine spatial planning and fisheries management (Mangubhai et al., 2015).

Overall, environmental governance may be: (i) informed by TK as location-specific knowledge and enhanced knowledge of environmental linkages, including of culturally significant marine species that traverse high-seas water columns and coastal areas; (ii) improved by local capacity building and power sharing, and (iii) benefit from community support of nearby people.

Application of TK and cultural values alongside non-indigenous science

TK has complemented science in the protection of biodiversity (development of the Nagoya Protocol, designation of EBSAs, ILBI/BBNJ instrument, IPBES assessments), as well as in climate action (Paris Agreement, New Zealand Climate Change Response (Zero Carbon) Amendment Act 2019), fisheries management (NOAA **https://voices.nmfs.noaa.gov**), mineral resources management (Inuit Circumpolar Council) and damage compensation (Local Communities in China) (Mamo, 2020). Also, the implementation plan for the UN Decade of Ocean Science for Sustainable Development defines "Ocean science" broadly to include "local and indigenous knowledge" alongside western science and "recognises, respects and embraces local and indigenous knowledge." It can also lead to tribal sovereign power as a waiver to state regulation, as exemplified by Makah Tribe waiver to the Marine Mammal Protection Act (Mamo, 2020) or at a regional level with the concept of oceanian sovereignty in the Pacific (Bambridge et al., 2021; Tilot et al., 2021).

Legal and policy status of TK in the context of deep seabed mining in areas within and beyond national jurisdiction

While coastal states enjoy sovereign rights over mineral resources within their national jurisdiction (i.e., up to 200 nautical miles from coastal baselines and in some cases even further), the United Nations Convention on the Law of the Sea 1982 (UNCLOS) makes clear that these rights must be exercised in accordance with national environmental policies and the duty to protect the marine environment (Article 193 of UNCLOS). It is now commonplace that coastal states have the obligation to incorporate TK into their national marine policies and the duty to consult and involve IPLCs in decision-making relating to offshore activities. This is particularly pertinent where it is clear that IPLCs will be directly or indirectly affected by such activities, whether as an infringement of customary rights and interests (including those pertaining to the protection of culturally significant marine species that migrate through high seas water columns (Ardron et al., 2008; Tilot, 2010)) or as an encroachment of their spiritual and cultural connection to the marine environment.[1]

In areas beyond national jurisdiction, the International Seabed Authority (ISA) is mandated under UNCLOS to administer mineral resources at or beneath the international seabed (also known as 'the Area'). The Area and its resources are deemed the 'common heritage of [hu]mankind' (Article 136 of UNCLOS), whereby the ISA represents and acts for the benefit of humankind as a whole. There is a tendency to assume that the Area is beyond the interests of IPLCs and TK, owing to its vast distance from the coastline and because the subject matter falls within the realms of international law. However, this assumption cannot be further from reality. For IPLCs, areas beyond national jurisdiction are not necessarily viewed any differently from coastal areas, particularly in the many cultures where long-distance ocean travel has long been an intrinsic part of cultural heritage (Lewis, 1972). Additionally, numerous marine species that migrate between coastal areas and high seas water columns (including those superjacent to parts of the Area where DSM activities are projected to occur and which might be impacted by those activities) have major social and cultural significance for IPLCs in those coastal areas, including sea turtles, sharks, and whales (Tilot et al, 2021). In fact, recent literature argues that the common heritage of humankind principle needs to be broadened to include TK and the interests of IPLCs (Hunter et. al., 2018), and that the free and prior informed consent (FPIC) of IPLCs for deep seabed mining activities in the Area should be obtained where necessary (Aguon and Hunter, 2019).

Where and how can TK be incorporated into the Mining Code? *BOX 1*

At the regional level, traditional knowledge can be applied alongside western scientific or technical knowledge in the development of guiding principles for Strategic Environmental Assessments and Regional Environmental Management Plans. For example, TK can contribute to the designation of protected areas (such as APEIs) that are critical to (i) maintain connectivity or ensure survival of key species, including those with major cultural significance for IPLCs, (ii) maintain indigenous navigation rights, (iii) recognize sacred or otherwise culturally significant areas.

At the contract/contractor level, TK should provide feedback into the key elements of the environmental management system, including: the designation of environmental objectives, the collection of baseline data and subsequent monitoring activities, the preparation of environmental impact assessments and environmental impact statements, the design of operations and associated mitigation, as well as reporting and communication requirements. Additionally, the definition of key concepts that trigger action (such as the definition of 'serious harm') could include traditional perceptions and cultural values.

At present, the ISA draft exploitation regulations include provisions for preserving human remains, objects, and sites of an archeological or historic nature that are discovered during mining-related activities, reflecting obligations set within Article 149 of UNCLOS. Such objects (i.e., tangible cultural heritage) are, for many people around the world, intricately linked to the traditional knowledge and cultural practices that are protected by other international conventions, such as UNESCO's 2003 Convention on the Protection of Intangible Cultural Heritage. Preservation of such objects, if found in the Area, will go some way to recognizing these broader cultural values. However, greater effort should be taken to consider TK and cultural values throughout the management process.

1. The New Zealand Court of Appeal recently confirmed this in a case involving an application to mine the seabed for iron sands, see Trans-Tasman Resources Ltd v Taranaki Whanganui Conservation Board [2020] NZCA 86

Case studies illustrating the application of TK in ocean management and practices. *BOX 2*

Protected Areas:

The coral reefs of Polynesia Mana Node (Cook Islands, French Polynesia, Kiribati, Niue, Tokelau, Tonga, and Wallis and Futuna) have a network of marine protected areas where local populations participate, reviving their culture and traditions as a basis for sustainable reef management (Tilot et al., 2021). The French Polynesia and Cook Islands Rāhui or Ra'ui refer to an ancient form of resource management whereby traditional leaders temporarily or permanently close specific areas to the harvest of certain species. In order to ensure the ongoing well-being of the people and their environment, these unwritten rules are often used to revive or build up stocks in anticipation of upcoming celebrations or food shortages (Vieux et al., 2004; Bambridge, 2016; Bambridge et al., 2019). By imposing a Ra'ui, the area concerned is believed to be relinquished to the gods, to be returned and reclaimed later on in restored fashion.

TK is partly integrated in the laws of the Cook Islands (Tilot et al., 2021). The 2017 Marae Moana Act created a multiple-use marine park ("Marae Moana", which can be translated as "ocean sanctuary") that serves to protect and conserve the ecology, biodiversity and heritage values of the Cook Islands marine environment (Flood et al., 1999; IUCN, 2018). Among others, it reinvigorates the local practice of Ra'ui by designating marine protected areas around each of the fifteen islands, reserved for the local communities and closed to seabed mineral activities. The 2019 Seabed Minerals Act also takes the visions and interests of the Cook Islanders into account by prescribing that seabed mineral activities in the Area may not result in irreparable harm to any community, environment or cultural practice in the Cook Islands (Willaert, 2020a; Willaert, 2020b).

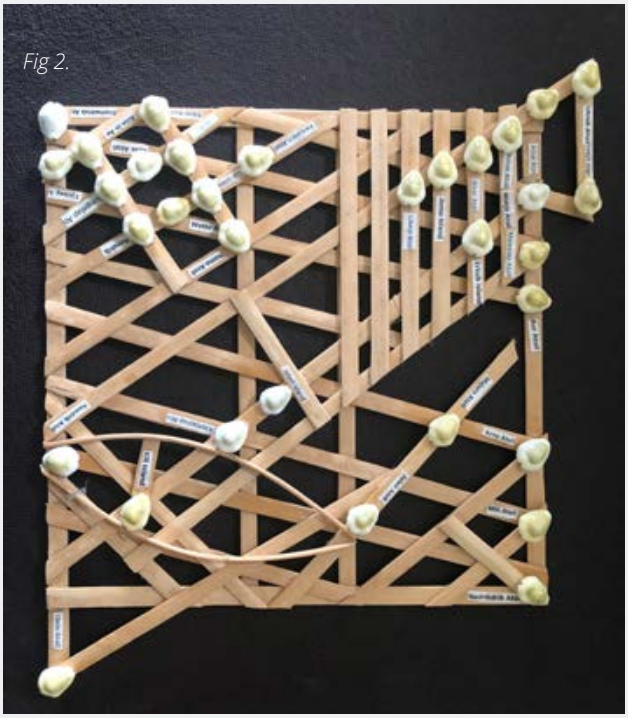

Fig 2. Marshallese navigation stick chart, used for teaching of navigation skills, from WAAN AELON IN MAJELI (WAM). Stick charts explain about wave and current patterns around the Marshalls atolls. Photo courtesy Elizabeth Holland.

*Fig 3. Alick Tipoti, "Kukiaw Bidhiyal", linocut / hand colored , 57 x 38 cm, 2006 © Alick Tipoti/**www.artsdaustralie.com**. Kuki in the Badu Island language means the wind blowing from the Northwest. Kukiaw Bidhiyal means squids of the Northwest season. During this time of the year many Bidhiyal are seen in the sea. Young children from different villages compete against each other for who will catch the most squids.*

Papahānaumokuākea Marine National Monument in Hawaiian waters protects cultural sites on the islands of Nihoa and Mokumanamana, the latter having spiritual significance in Hawaiian cosmology (Kikiloi, 2010). In the nomination document for Papahānaumokuākea as a UNESCO World Heritage Site, traditional chants, ceremonies and beliefs were included as examples of living heritage and evidence of cultural value that is cosmological (State of Hawaii 2008). Papahānaumokuākea was inscribed onto the World Heritage List in 2010 as a mixed (natural and cultural) marine heritage site, recognising the site as a "sacred cultural landscape" and demonstrating that natural heritage may also be cultural heritage (**https://whc.unesco.org/en/list/1326/**).The success of traditional marine management by communities combined with science-based tools and approaches in Pacific Islands may help the world find appropriate solutions to conserve cultural and biological diversity and reach the international targets related to conservation and the sustainable use of biodiversity (Tuquiri, 2001).

Marine Maps and Navigation:

Fisherfolk of Pentakota, a village in Andhra Pradesh in India, refer to the sea surface using landmarks and to depth as *baralu*, the local word approximated for fathoms. The 'Marine Map' was prepared by the fisherfolk through a rural participatory appraisal exercise conducted by the NGO Sakti. A follow up effort by the Indian National Centre for Ocean Information Services (INCOIS) and Sakti brought together various stakeholders – traditional fisherfolk, GIS and remote sensing agencies, biodiversity experts – to showcase the Marine Map and develop high resolution maps that incorporate location-specific knowledge of the

fisherfolk across 33 villages. Indicators include moon phase, star constellations, wind and tides, marine habitats, sun halo, water temperature and smell, birds, sea snakes, and bubbles (Salim and Monolisha, 2019).

Oceanic peoples were proficient navigators capable of reaching, establishing colonies or maintaining trade with distant lands, relying on their intimate knowledge of marine species and processes (among other natural elements) to guide their voyages (Lewis, 1972). Extensive movement of ancestral Oceanic people, or *kanaka maoli*, across vast Oceania was based on their abilities to reliably find small islands in a large ocean using instrument-free navigational techniques based on detailed knowledge of astronomy, oceanography, meteorology and biology (Lewis, 1972; D'Arcy, 2006; Eckstein and Schwarz, 2019; Ey and Sherval, 2016). Most of this knowledge was passed across generations by oral tradition and a formalised system of apprenticeship (Low, 2013) but some tools, such as the stick charts of the Marshall Islands, (Fig 2) were used to represent and teach navigational techniques, ranging from models of the interactions of oceans with land (known as *mattang*) through to more map-like representations (*meddo* and *rebbelith*) of island chains (Ascher, 1995). The physical oceanographic basis of these TK wave concepts and models is only partially understood and doesn't fit easily within a Western scientific framework (Hau'ofa,1994; Wendt, 1976; Waddell, 2000; Genz et al. 2009).

Origin Myths

The Haida, an Indigenous group who have traditionally occupied the Haida Gwaii archipelago for at least 12,500 years (Fedje, 2005), have oral traditions that link Haidas' emergence from the ocean to the formation of the SGaan Kinghlas-Bowie Seamount in the North Pacific Canadian exclusive economic zone, with SGaan Kinghlas as a supernatural being. The Haida Nation designated this seamount as a marine protected area in 1997; Fisheries and Oceans Canada proposed to create an MPA in the same area a year later, officially designated in 2008 (Watson and Hewson, 2018). Here, Indigenous knowledge, governance and scientific field expeditions combined to survey and understand change in the oceans (Mustonen, 2019). Polynesians are said to have one of the richest, most diverse and complex collections of mythological tales and legends about deities, demigods and heroes anywhere in the world (Caillot, 2010; Hecht and Biondo, 2010).

Ancestral connections with the sea

Some African cultures consider the sea as a place of residence for ancestral spirits (Elliot 1972, Dold and Cox 2014) and water divinities (Fig.4) and as such many regard the ocean as sacred, with reverence considered to increase with depth (Bernard, 2013). In South Africa, Nguni-speaking diviner-healers report that they are called upon, physically or in a dream, to travel underwater to acquire knowledge and healing powers. Animals from the deep ocean are also used in traditional medicine and ritual, and are considered strong medicines or charms. The sea is often referred to as 'Komkhulu" or "The Great Place" (Bernard, 2010) and there are increasing calls to recognise and account for the deep respect and the cultural and spiritual significance of the deep ocean in planning and decision making.

For people of African descent, the Atlantic seabed may be considered a culturally important seascape due to the history of the transatlantic slave trade and the ~1.8 million Africans who died at sea during their Middle Passage (Turner et al., 2020). The importance of the Atlantic seabed in African diasporic cultural memory is evidenced through poetry, music, art and literature; leading for calls to consider how the area where those who lost their lives at sea ultimately came to rest - the Atlantic seabed - can be recognised and memorialized internationally (Turner et al., 2020).

In Oceania, there is an ancestor veneration which acts to cultivate kinship and continuity of family lineage. Many creatures can be guardian spirits, some emblematic for certain island nations such as octopuses (Na kika in the Gilbert islands), turtles (Tabakea in Samoa), eels (Riki in Samoa), sharks (Dakuwaqa in Fiji), or whales (Tangaroa for Māori) (Grimble, 2019; Loebel-Fried, 2002).

Fig 4. Moyo Ogundipe (b.1948, Nigeria—d. 2017, United states) Mami Wata, 1999. *Acrylic on canvas 121.9 x 152.4 cm. Collection of Chike Obianwu. Image courtesy Fowler Museum at UCLA; Photograph by Don Cole, 2008*

Essential to incorporating TK and involving IPLCs in decision-making are:

(i) meaningful engagement with the relevant groups under the domestic setting;

(ii) identifying and involving them in the ISA process;

(iii) aligning the sectoral mandates and activities in ABNJ (e.g., between the ISA and the IMO (shipping), FAO and RFMOs (fisheries), ICPC (submarine cables)[2] and the ongoing negotiating process for the conservation and sustainable use of marine biodiversity of areas beyond national jurisdiction (BBNJ));

(iv) engaging contractors, States, NGOs and the regulator in TK.

An important step would be to have TK data repositories that are consistent with the IOC Oceanographic Data Exchange Policy or the relevant UN subordinate body data policy. However, any such repositories must be formed with the free, prior and informed consent of the relevant TK holders, in accordance with the United Nations Declaration on the Rights of Indigenous Peoples. If TK holders do not wish to share their TK, especially for online repositories, then such sharing must not be compelled. Even if sharing is allowed, it must be done through a culturally appropriate and rights-sensitive manner.

Recommended Actions:

- Enable broad engagement using multiple approaches to identify the key holders and repositories of TK and their areas of expertise.
- Consider a broad diversity of deep-sea perspectives, including multi-cultural and spiritual significance, in collective decision making. Within national legislation and ISA regulations, recognize the cultural and social values attached to traditional knowledge and practices related to marine ecosystems and seabed resource management.
- Incorporate traditions related to environment into risk assessment measures through a precautionary approach.
- Foster an adaptive, context-based socio-ecological governance structure that relies on the active participation of local and traditional communities in decision-making, as well as in implementation of DSM projects.
- Integrate TK into marine spatial planning and governance processes wherever DSM projects take place.
- TK holders/experts should be given the opportunity to participate directly in institutional arrangements at the ISA pertaining to the implementation of the Mining Code, including as experts elected to or consulted by the Legal and Technical Commission, in order to ensure that the solicitation, evaluation, and incorporation of TK by the ISA is done in a holistic, culturally appropriate, and rights-sensitive manner.
- ISA Member States should undertake a strategic level of engagement with 'the public' on matters that are beyond the scope of individual EIAs and to gauge the extent to which they are operating in the interests of all [hu]mankind. Such engagement should use multiple media and not only rely on electronic communications and/or the review of technical documentation based on Western practices.
- Raise public awareness of TK through: One Ocean Hub Code of Practice, The International Indigenous Youth Council, Elder councils, showcasing TK in the most appropriate medium.

ABOUT DOSI

The Deep-Ocean Stewardship Initiative seeks to integrate science, technology, policy, law and economics to advise on ecosystem-based management of resource use in the deep ocean and strategies to maintain the integrity of deep-ocean ecosystems within and beyond national jurisdiction.

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2. IMO - International Maritime Organization
FAO - Food and Agriculture Organization
RFMO - Regional Fisheries Management Organization
ICPC - International Cable Protection Committe

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