

Report of the Cultural Scoping Study

Dugong and Seagrass Conservation Project

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Executive Summary

The multiyear Dugong and Seagrass Conservation Project (DSCP), launched in 2015, spans eight countries, from the east coast of Africa to some of the farthest Pacific Island nations.

The project is executed by the Mohamed bin Zayed Species Conservation Fund, with financing from the Global Environment Facility (GEF), implementation support by UN Environment, and technical support from the Convention on Migratory Species (CMS) Dugong MoU Secretariat.

Project developers at an early stage identified the importance of understanding the cultural relationships between indigenous peoples and local communities (IPLCs) and dugong and seagrass. As a result, the cultural scoping study was conceived, designed, and consultatively developed by a small team of experts to be conducted over a period of 12 months.

The six of the eight DSCP countries participated in this cultural scoping study: Madagascar, Malaysia, Mozambique, Solomon Islands, Sri Lanka and Timor-Leste. This report is a documentation of a “rapid cultural assessment” of these six countries that present a good regional representation of the dugong habitat range.

The aim of the cultural scoping study was to highlight and build as much insightful information and traditional knowledge as possible on dugong and seagrass, towards their effective conservation.

The approach and method of this scoping study were customized to take into account the time and scheduling constraints; the diversity of skills in executing research, survey, and analysis; as well as, the apparent geographic, demographic, and cultural diversity.

The cultural scoping study has given equal importance to seagrass and dugongs in the design of the survey.

It has helped to build a preparatory platform to value the indigenous peoples and local community's traditional knowledge on the dugong and seagrass. It has brought to light the presence of similarities in characteristics of communities that live alongside these species, despite different geographic locations of the sites, and different site demographics.

The findings of this study intend to serve as a comprehensive basis for a broader cultural valuation study in the participating countries, and in other countries contemplating similar conservation interventions.

A total of 22 sites were surveyed in the 6 participating countries and 44 survey records were received for processing that contributed to the analysis presented in this report.

The analysis of the survey shows that the initial deductive (demographic and psychographic) framework to characterize the cultural information (age, gender, education, occupation, and transfer of oral information, beliefs and practices,) held good in providing valuable insight. These parameters should continue to be important fundamental considerations in all cultural studies and studies on traditional knowledge.

The synthesis of the qualitatively analyzed survey information resulted in a valuable data-led (inductive) framework of results per site. The basic framework (schematic presented in Figure 1) that emerged from the data allowed the identification of common characteristics in the perception of the species, and likely drivers of behavior around the species, in all the surveyed communities.

On populating this basic framework with participant responses, the preliminary visual that emerged was a site-based comparability of the density of information (detailed in Appendix 5). This helped in a first rapid visual assessment of the participants' traditional knowledge and perceived cultural significance of the species. Greater the density of information held in the chart, greater the detail of shared information on the species (even if the detail are scattered remnants of indigenous or traditional knowledge) for the surveyed community. And therefore a relatively greater likelihood of transfer of the information.

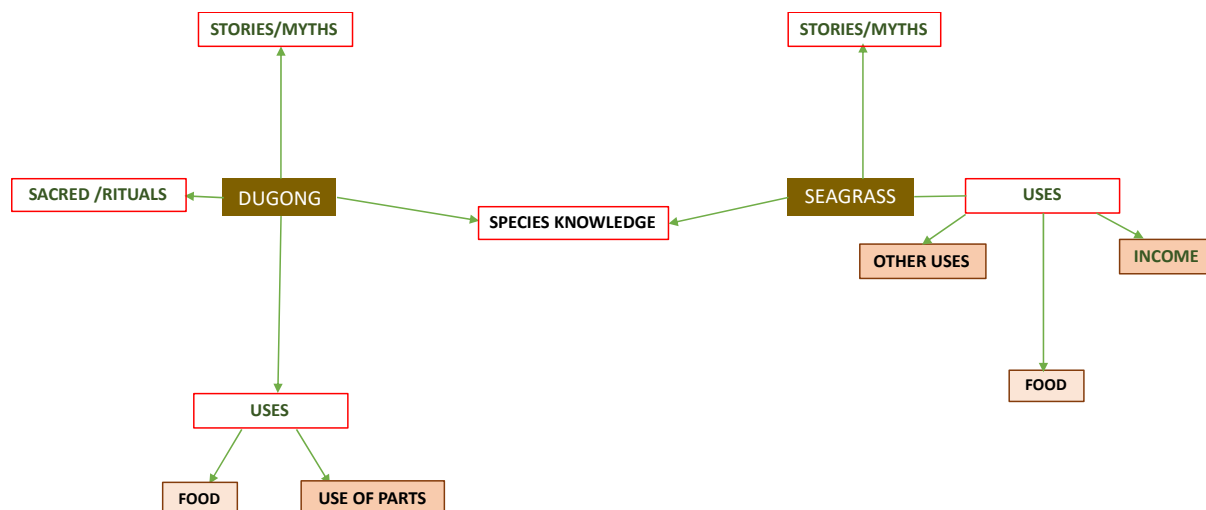


Figure 1: The emergence of recurrent themes in the remarks of the participants across all the sites in all the countries resulted in the development of this schematic.

The survey data and results of the synthesis were corroborated through information from other studies, for rigor.

The cultural scoping study has highlighted that traditional (or indigenous) knowledge, beliefs and practices indicate an intergenerational relationship of the community to the species. The cultural scoping study not only reinforces but offers a more nuanced understanding of what is broadly known by the conservation community that knowledge on cultural characteristics and sensitivities, alongside collaborative exchange of information with knowledgeable community members and their active participation, could help plan, design and execute effective and efficient conservation programs and policies.

The inferences from the survey data analysis and synthesis present particular and key insights for the 22 sites in the six participating countries. We learnt that:

- Language, whether in names of the species, their descriptions, or oral transmission of stories, parables, songs, etc., plays a significant role in the perception and behavior of the community members around these species. It is a first point of entry on cultural characteristics of a community.
- In most sites seagrass beds were seen as important for fisheries, whereas dugong held a more complex and intrinsic value, both tangible and intangible. In the sites in Malaysia, the seagrass fruit are an important cultural link to dugong.
- In the past the traditional beliefs and practices appear to have defined the roles, responsibilities and occupational profiles of communities around dugong in particular.
- Some of the traditional (indigenous) beliefs and practices likely inform, to this day, community codes of conduct such as deterrence or promotion of certain perceptions and behaviors around the dugong and seagrass.
- In majority of the survey sites custom or source stories are an important identifying feature of the species relationship to specific tribes or whole communities. This is likely true also in countries where only remnant practices remain around these species. Most of the custom or source stories recounted are around dugongs, while the seagrass are a supporting feature of the story.
- The custom or source stories show attachment, relationships, uniqueness, priorities, and behaviors towards the dugong and seagrass in an informal way. Custom stories are passed on easily to children and are recounted with fervor through generations, reinforced through present-day experiences.

- Gender and age are important considerations in the transfer of traditional knowledge. Occupationally active fishers and retired fishers of the community transfer experiential knowledge: knowledge of the biology of the species, where it could be found, what value it holds, traditional hunting and fishing activities, etc. Women and elders, meanwhile, play a significant part in cultural education of the younger generation. Women and elders sing songs, narrate stories to children and introduce them to lifestyles in context to their surroundings.
- Differences in the perception of the species and knowledge of the species, were noticed based on the occupation of the participants. The knowledge of the fishers on dugong and seagrass was more detailed and their sensitivity to the species was more evident given their occupation, compared to farmers or traders. Remarks from certain sites also highlighted the degree of penetration of the significance of the species across occupations as well as the likely demand for the species from other occupations.
- Knowledge that is recently acquired that does not have cultural depth, could likely show weak retention over time. This, as the use of language, tools and mechanisms of introduction are culturally unfamiliar or irrelevant. Aided responses from participants showed a lack of personalization of the information and therefore will likely fail to incite the same behaviors that a custom story or a song or a ritual might incite.
- The cultural recognition of the species and relationship characteristics of the species to humans appears to be a significant source of traditional ecological knowledge (TEK).
- Custom or source stories are narrated, recalled and transferred as long as the enabling social and environmental contexts exist. Over time these stories are modified, distorted, diluted or sometimes forgotten. This is a result, often, of changing environments and the loss of pivotal characters or situations. There are a growing list of influences to traditional and cultural beliefs and practices that range from the loss of species, to technology, religion/ religious institutions, rapid socio-economic development, global market influences, alternative livelihood options, etc. What often tends to remain of the story over generations, if at all, is either the fantastical/ supernatural elements; or the core belief; or sometimes the irrelevant (that could be constructive or destructive) narratives.
- Sensitivities due to nature of cultural knowledge/ practices and apprehensions to sharing information because of regulatory and/or legal enforcements of behaviors around dugong and seagrass were noticeable, but not always clearly understood or identifiable through the survey.
- All the participants expressed genuine concern on the uncertainty of the future in maintaining their subsistence livelihoods, as they have known it for generations, if one or both of the species were lost. The participants are acutely aware of the fast pace of socio-economic and technological change that are influencing the nature of their current lifestyles and occupations. Their concerns are around not just the deterioration of their fisheries efforts but also loss of their primary source of food and nutrition.
- The common sentiment across all the participants was for their children to have a better future and to know the dugong and seagrass as their parents and grandparents have known them- as part of their coastal life, their occupational heritage, and as part of their unique cultural knowledge. The participants shared their concern about the losses their children would face to not know or benefit from dugong and seagrass if these species left their seas and coasts, or disappeared.

The cultural survey also highlighted the social dynamics that influence the information that was gathered. Whether, age and/or position related hierarchy in society, the roles and responsibilities of women in the community, the diversity of occupations, or the engagement and perception of children were identified as being as important as the survey site selection, survey execution, data recording and analysis techniques.

These are all critical insights and parameters to consider for further detailed cultural evaluation or for the planning and designing of future conservation interventions.

The results of the cultural scoping study have highlighted that the surveyed communities are not likely to pose the single biggest direct anthropogenic threat to dugong and seagrass.

In particular, the cultural scoping study in the six participating countries has helped highlight entry points of conservation engagement, and mechanisms of conservation support and action.

Further, the framework, techniques, and insights of the cultural scoping study are equally applicable to any conservation study with an intention to characterize anthropogenic influences. It is not bound by geography or number of countries, and, as demonstrated by the DSCP cultural scoping study, can be planned and delivered in a relatively short time frame. The added insight from the framework is that it is possible to discern a format through such a scoping study that allows an “economy of scale” of conservation interventions.

Finally, recommendations have been developed following detailed conversations with the country project leads for the cultural scoping study and their post survey questionnaire responses. Extensive conversations were also held with the DSCP coordinator to align and frame the recommendations to the context of the broader Dugong and Seagrass Conservation Project profile.

The recommendations have been presented in a bulleted format under three distinct sections:

- recommendations that are directly relevant to improving dugong and seagrass conservation efforts in the six participating countries;
- recommendations that are important to consider when designing a cultural scoping study and survey; and,
- recommendations on the potential next steps drawing from this cultural scoping study.

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Introduction

The Dugong and Seagrass Conservation Project (DSCP) began in 2015 to “enhance the conservation effectiveness of seagrass ecosystems supporting globally significant populations of dugongs across the Indian and Pacific Ocean Basins”. This project is executed by the Mohamed bin Zayed Species Conservation Fund with financing from the Global Environment Facility (GEF), implementation support by UN Environment, and technical support from the Convention on Migratory Species (CMS) Dugong MoU Secretariat.

Dugong (*Dugong dugon*) and its seagrass habitat occur in tropical and sub-tropical, coastal and island waters from East Africa to Vanuatu (Marsh et al., 2002). Eight countries - Indonesia, Madagascar, Malaysia, Mozambique, Sri Lanka, Solomon Islands, Timor-Leste and Vanuatu - participated in the DSCP. These 8 countries, of the 40+ dugong range states, are a good representation of the geographical extent of the distribution of dugongs, making the DSCP the first coordinated global effort to study, update records and plan conservation of the dugong and their seagrass habitats.

The DSCP includes 40 national initiatives, focused on incentives, research, policy, education and awareness in the 8 project countries, executed by more than 30 local partners. Each of the countries were tasked to collaboratively work with the local communities to improve fisheries practices, find alternative livelihoods for local coastal communities, improve site management and monitoring at large through, among others, the establishment of Locally Managed Marine Areas (LMMA)/ Community Conservation Areas (CCA)/ Marine Protected Areas (MPA), and mainstream dugong and seagrass conservation priorities into national and regional policies and planning.

A Cultural Scoping Study was commissioned in October 2017 to add a valuable dimension to these efforts. It has offered the DSCP the opportunity to highlight and build community information and traditional knowledge into conservation efforts and activities. Partners from six countries participated in the cultural scoping study, representing each of the Project regions – Africa, Asia and the Pacific.

A total of 22 sites in 6 countries were surveyed that help to outline important insights and learnings in relation to understanding the value of cultural studies in approach to conservation, messaging, as well as in decision-making and policy development.

The report is presented in 5 main chapters:

- Research agenda and Approach
- Data and Analysis methods
- Results of Analysis
- Inferences
- Recommendations

The primary audience for this report are the DSCP management, conservation scientists and outreach teams (engaged in outreach, awareness and education activities).

The content of this report also provides insight into a tailored and specialized approach to design of a qualitative study as well as a tailored approach to qualitative analysis, including where and how the design and analytical method can contribute to other projects and programs. This report can be used to raise support for such studies to be undertaken regularly at the start of and as part of all environmental, conservation and development projects.

1. Research agenda and approach

The research agenda of the cultural scoping study was built on the DSCP objective to “*enhance the conservation effectiveness of seagrass ecosystems supporting globally significant populations of dugongs across the Indian and Pacific Ocean Basins*”..

1.1. Developing the research agenda

Initially, the cultural scoping study was planned by the DSCP Coordination Team as a comprehensive cultural valuation study. Guided by the Terms of Reference for the cultural valuation study, discussions were held with experts on the design and management of the study.

The conceptual framework presented by Iacob et.al (2012) highlights that the term "value" has different connotations such as - use vs non-use, individual vs collective, tangible vs intangible, including public vs private. Value largely derives from the economic realm of a finite measurement structure that facilitates decision-making. Hence, a (cultural) valuation study was understood as a multidisciplinary undertaking that assigns as definitive a value (numerical or judgment) as possible on a set of (cultural) variables that influence a topic (conservation of species). Such a study would have to be based on relatively significant and topically consistent baseline information as well as require significant time, multidimensional and multidisciplinary resource inputs.

The challenge to develop and, for all DSCP countries to contribute effectively to a cultural valuation study, within the time frame of 12 months was recognized by all parties. Based on this reasoning, a pragmatic decision was taken to re-design the scale of the study from a cultural valuation study to a “cultural scoping study”, and to make participation of DSCP countries in the study optional. This scoping study offered to be the stepping stone to any cultural valuation study undertaken in the future.

This scoping study’s primary research objective was to assemble detailed stories and cultural insights from site/s in participating project countries about the local community and their access to, and use of, seagrass and dugong in their daily living and traditions. The study aimed to also note evidence of the presence (gradual loss, or even absence) of any intergenerational cultural relationships to these species; identify the likely reasons for the current cultural traditions and relationships; likely differences in relationship based on age, gender, education or occupation; and, identify traditions, knowledge and cultural norms that are important to consider that could likely contribute to conservation success.

A Cultural Scoping Study work plan and approach was formalized in November 2017.

Partners across the eight project countries were called to express their interest to contribute to the study. Seven partners from six countries (see Map 1) responded positively. They were further contacted to introduce the cultural scoping study and obtain their perspectives and guidance.

Map 1: Global view of geography of the six countries from three continents that contributed to the cultural scoping study. (prepared for DSCP cultural scoping study by Environment Agency Abu Dhabi)



The work on the scoping study began in December 2017.

1.2. Approach to a cultural scoping study

The approach was drawn from the primary research objective and built from a platform of informing likely cultural influences to effectiveness of conservation activities and the protection of the dugong and its habitat. Conservation of the species was the fundamental consideration in defining the cultural scoping study.

The overall phases of the cultural scoping study are presented in Figure 2 .

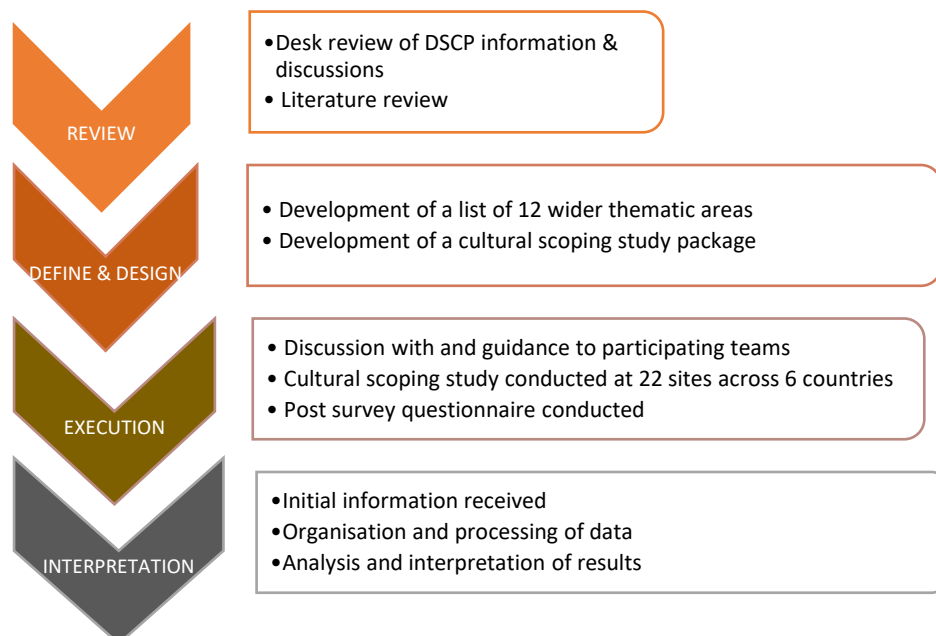


Figure 2: Schematic of the phases of the cultural scoping study

1.2.1. Review of available baseline information

The baseline information for the cultural scoping study was obtained from discussions with experts; DSCP project documents; and, literature external to the project sources.

The discussion with DSCP experts helped to define the terms of the study, inform the approach of the study and advise the development of the study throughout its course.

The DSCP project documents, included project reports, presentations, and project interviews. This material has already shown some distinct cultural linkages between communities and dugongs (See Box 1 below and Appendix 1 for a full compilation of cultural information from DSCP documents).

Box 1: Key information points assembled from DSCP documents

- The common relationship of the dugong noticed across all the countries was for its meat—some indicating specialized hunting, while others benefit of its meat from accidental catch. Majority of the dugong meat, however, being locally consumed
- There is indication that dugong parts have been known to be used for medicine or witchcraft, as trinkets, tools and artefacts, and in two countries there is mention of monetary value associated with the sale of dugong meat.
- In three of the 8 project countries, there is mention of the protection of the dugong that draws from either a legal status, a tribal belief, or community self-regulation (practice of traditional or customary seasonal restriction).

On close scrutiny of the DSCP documentation on information relevant to cultural contexts of sites, it was noticed:

- that within a country there are different practices and beliefs documented around the dugong;
- that there is no profile of who shared, believed, practiced this information (man, woman, old, young, region, tribe, origin, etc.)
- that not all information from the countries consistently cover the same themes in terms of relationship or use; and,
- that likely due to incumbent penalties there is an understandable restraint in the information shared (or available) on dugongs.
- It is also evident that it was necessary to understand the relationship and use of seagrass, as for dugong.

Within the desk-based study, country-specific, species-specific literature and literature on social science/ anthropology, specific to the species in the project region were searched using subscription to Researchgate and Deepdyve online platforms. A full reference list of books, journal articles and reports used in the development of the cultural scoping study have been listed in References.

1.2.2. Defining scoping study themes

The first questions that were raised following the review stage were:

1. Are there commonly known or narrated **oral information** (on dugong and/or seagrass) that are passed on from generation to generation? E.g., Stories, songs, phrases. How does it influence perception of or information on the species?
2. Are there commonly held **beliefs**, or known **practices** or **uses** of dugong and seagrass followed by (or transferred by) ancestors of participants? How does it influence perception of or information on the species?
3. Do **age-based differences** indicate differences in perception of the species or information on the species?
4. Are there **gender-based differences** in perception of and/or information on the species?
5. Does **formal education** influence information on or perception of the species?

6. Priority would be given to fishers who are expected to have the most direct relationship with the species, if any, by nature of their occupation. But if community members holding other occupations were also considered, then are there **occupation-based differences** in information on or perception of the species?

It was clear that the responses to the questions were to be predominantly descriptive with quantitative information to support and contextualize it.

Knowing that communities and their cultural nuances across different communities were being studied, within and across countries, it was necessary to put measures in place to optimise comparability across countries and communities, maximise replicability for future studies as well as find a cohesive, common sense methodology of interpreting the predominantly qualitative information that would be gathered.

Categorizing descriptive information to be grouped under quantifiable variables (such as gender, age, education, occupation, etc.) would allow meaningful comparison across countries or communities e.g. compare differences between responses of men and women across countries or compare differences between fishermen's and others' responses across countries. A further benefit of this would be that it allows better replicability in future studies, e.g. looking into evolution of the differences between men and women over the years or, as with this study, look into the difference between men and women in other countries or for other areas of interest.

Following this assessment a total of twelve thematic areas were identified as relevant to the project countries with focus on dugong and seagrass related knowledge, as well as relevant use and governance of the habitats/ ecosystems of seagrass and dugong. The twelve themes are presented in Table 1.

Table 1: Twelve thematic areas and range of culture and tradition related queries within each theme

THEME	DESCRIPTION/ PURPOSE
1. Language-nature links	This is to take note of names and words (meaning and etymology, where possible and available) relating to seagrass and dugong that could present a first look into perception of the species.
2. Sacred sites, sacred species	This is to help identify and locate the value of the species in the community. It also could provide insight on when, why, where and how these species are/were perceived.
3. Traditional art, construction and architecture	Inspiration from the natural environment in designing and depicting community lifestyles is well known, even to this day. This theme intended to provide insight into whether (and how) the dugong and seagrass may have been literally or symbolically used in a community's life.
4. Medicinal and other such traditional healing uses	The natural environment has been a source of healing in itself and species (or parts of a species) are known to have curative properties. This theme delves into any known and practiced traditional uses of dugong and seagrass.
5. Tradition-based other representation or uses of dugong and seagrass in human lifestyle	This theme seeks to note decorative uses of dugong and seagrass that represent community identity and expression
6. Rituals, festivals, folklore	This theme explores the passing down of specific practices whether oral, ceremonial, practiced by community, clan or specific to an occupation, over generations (or forgotten) in relation to the dugong and seagrass or parts of the species
7. Traditional hunting	This theme is to find out if there is (or there was) a traditionally practiced form of hunting of dugongs in the community. Possible reasons for this practice could be food, sport, medicine, maybe of cultural value such as rite of passage,

THEME	DESCRIPTION/ PURPOSE
	ceremonial requirement, etc. including any traditional/ inherited background to this reason. NOTE: Likely sensitivities or legal issues that might hinder conversations on hunting within the indigenous peoples and local communities. This discussion, if hunting is still practiced (and legally permitted) or was practiced, is to be pursued with sensitivity.
8. Traditional foods	This refers to the seagrass and/or dugong as a traditional part of the diet of the indigenous peoples and local community
9. Traditional / unique fishing techniques	This theme is to note traditional fishing experiences that have relevance to dugong and seagrass
10. Traditional agricultural practices	The idea is to obtain as much information as possible on the influence of dugongs and seagrass in the traditional agricultural practices of the communities.
11. Community coastal land and marine areas management systems based on local traditions	The themes 11 and 12 were intended to record any existing, influencing, or obsolete governance practices of the dugong and seagrass habitats that were influenced by traditional importance or use of marine species, and where relevant influenced the protection of dugong and seagrass. <i>The remit of these two themes was too expansive and therefore was not pursued within the scoping study*.</i>
12. Traditional governance structures and systems in the community	

With prior input from select DSCP country experts on the themes, a comprehensive list of queries within each of these themes were brainstormed, developed and finalized by the study team. Each theme has a set of associated questions, which all together provide the foundation for a comprehensive cultural valuation. The full version of the table including the questions can be found in the Appendix 2 Themes and guiding questions.

These themes provided a comprehensive framework to address active, obsolete/archaic, passive, intrinsic or ingrained elements of a community's beliefs and practices.

1.3. Designing the Field Survey

It was necessary to be mindful of the time and discipline related factors that informed the development of the field survey. These factors have been discussed briefly below.

1.3.1. Logistics

Given the 12 month time frame available for the scoping study, it was decided that maximum time flexibility would be afforded to field work given that

- Social science surveys are time consuming
- Surveys would likely have to be scheduled within existing field activity schedules
- Field staff familiar with the survey sites would need to plan and manage the time and setting of cultural scoping survey

Once the format of the survey was ready, it was expected to be conducted between February and June 2018.

* The DPSIR study commissioned by DSCP would likely address some of the elements of themes 11 and 12.

1.3.2. Skills

It was necessary to focus in on the strengths and expertise of all involved in the survey, particularly acknowledging the challenge of distances between DSCP countries and diversity in the profile of the participating organizations, in ensuring success in the overall ability of the scoping study team:

- to effectively brief the executing team,
- to translate the survey to local language/s,
- to conduct the survey in the local language/s
- to maintain sensitivity to differences in local dialects
- To minimize multiple and varied perceptions of a survey question or its objective, and
- To effectively express the question and facilitate ease of transcription of the response.

This would improve consistency of output, reducing the likelihood of misunderstandings, errors and false perceptions in translation, transcription, and the analysis.

1.3.3. Information rigor

In order to receive a broadly representative, diverse and as robust an information pool as possible within each interaction effort, it was decided that

- **Focus group discussions** were preferred over individual interviews. Focus group discussions are known to create group interaction that would allow respondents to build upon each other's perspectives, deepen the discussion, offer more opportunities to probe, and help understand the group interaction as well as broader community thinking.
- **Collection of demographic variables**, the easiest definitive data to gather, (alongside psychographic variables, such as personality, attitudes, lifestyle, etc.) were prescribed. Early conversations with the DSCP representatives as well as looking into other DSCP material and secondary data sources, suggested that attitudes, behaviours & cultural nuances in communities were most differentiated by these variables, i.e. men thought differently from women, fishers thought differently from those in other occupations, the community elders had different attitudes and knowledge than the youth.
- **Demographic segmentation** was the most pragmatic to action upon later, as it is easiest to identify people based on their demographics (how old they are or their gender or what they work as or how educated they are or their income or where they live) rather than psychographics (e.g. attitudes towards dugongs or seagrass or conversation, personalities like being extroverted, determined or authoritarian), making it easier for learnings from the study to put into action among the community (e.g. specialised education programs for men and women).
- **Corroborative data** from other sources to contextualize and/or validate all the first-hand information gathered was incorporated in the development as an important cross-check mechanism to ensure rigor.

1.3.4. Field execution format

It was established that the survey sites would be selected by the participating organizations in the 6 countries and would coordinate translations, recordings and transcriptions, where necessary. The scoping study survey development team was to provide the format and supporting material for the survey.

The survey was planned as a moderated questionnaire for a semi-structured informal focus group discussion in the selected communities. In order to standardize the format of the survey, guidelines were issued to all participating field offices (see Appendix 3 Survey Pack) on the number of participants per site, broad age categories of participants per site, separate gender surveys per site, preferred

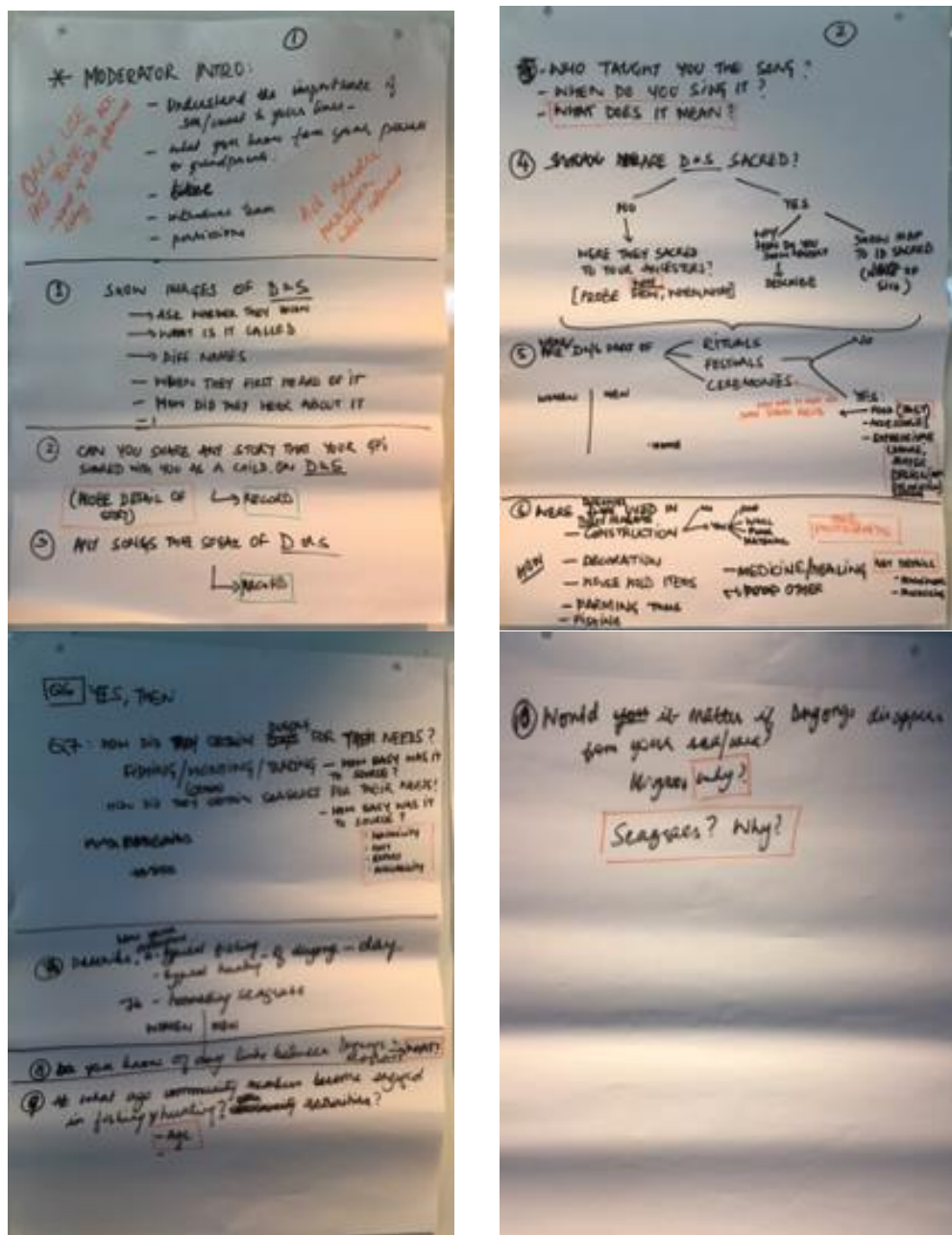
occupational profile and diversity, as well as preparing for ideal conditions and participant convenience in each survey.

The questionnaire was designed keeping in mind the following common elements:

- a distinction in the perception between dugong and seagrass, yet investigating the knowledge of communities of the link between them;
- the perception and role of women in dugong and seagrass appreciation and/or use
- the need to look for information among the older part of the studied communities, yet looking for information about the early age involvement of children in fishing
- sensitivity to some themes have been overcome by directing the question to the past, historical situation.

The questionnaire developed for use in the field was drawn from the study themes. The themes were re-worked into a simplified, executable, but effective questionnaire format designed in active and intensive consultation with the DSCP executing team at MBZ (see Photo 1).

Photo 1: Re-structuring the themes to build a cultural scoping study survey pack



Along with the guidelines, the field teams were provided with a slide presentation to provide an overview of the activity and process of the cultural scoping study, and survey supporting material that included a standard format for recording discussions, community and participant detail, and reference materials used including photos of dugong and seagrass to assess visual recognition of the species by the participants (see Appendix 3 Survey Pack).

1.4. Additional contextual information

There was an opportunity, in addition to the focus group interviews, to find ways to strengthen insight into the generational context as well as an understanding of the contemporary setting of the cultural information that would be obtained from the focus group discussions. To this end two additional surveys were recommended as detailed below.

1.4.1. Oral histories

It was believed that the focus group discussions would offer an insight into or lead to the sources of specialized information pointing to Elders in the community who might hold a wealth of cultural information. A separate file with guidelines was developed for the field staff to identify and record cultural/traditional narratives from Elders around the dugong and seagrass, from the local community.

Although this account would serve to note the presence of traditional influence in the community, these individuals were to be approached acknowledging sensitivities in sharing traditional cultural information or disclosing details of practices or beliefs.

Where such specialized interviews were possible, it was agreed amongst the project team that the details shared would only serve to add validity and value to the information from the focus group discussions, and would be treated as confidential, unless advised otherwise.

1.4.2. Post-survey questionnaires

The time and efforts invested by the field researchers and field country offices to build a rapport with their project communities was considered an equally invaluable reference to cultural information. The passive internalization by field researchers, of community lifestyles and traditions in the course of gathering scientific data on the species, or sharing species conservation practices with the community, was thought important to this scoping study. Further, the likely insight of the project office on the history, politics and governance characteristics of the project site would offer an overview context to the cultural identity and characteristics of the community.

Two post-survey questionnaires, one targeting the field researchers perspectives and the second for the country office were prepared and distributed, soon after the focus group discussion notes were received.

This was also an opportunity for the survey teams in countries to share their thoughts on the challenges to the execution of the survey and their opinion on the value of a cultural study.

2. Data and analysis methods

This chapter presents the characteristics of the data that was gathered from executing the customized cultural scoping survey and the approach to its analysis.

2.1. Data sources and characteristics

The design of the cultural scoping study presented multiple sources of cultural information were categorized into primary and secondary sources as shown in Figure 3. The secondary sources of information broadly helped support/ reiterate/ corroborate primary information.

Figure 3: Data sources for the cultural scoping study



Majority of the primary data that was received was qualitative in nature (perceptions, species knowledge, rituals, practices, uses, stories, etc.). Such data were sorted by thematic categories. This helped highlight the recurrent and common themes across the sites.

The number of sites, number of surveys were the first quantitative data points recorded. Within the surveys, there was a fair amount of quantitative information on number of participants (including by gender and age), occupational and educational profile of participants by site, where available, that were processed.

Two survey questions (**question 1** on species image recognition brought out participant information on the age that they had first heard of or seen dugong and seagrass; and, **question 9** on the age at which children – girls and/or boys – engage in fishing or hunting activities) prompted “semi-qualitative” responses.

2.2. Data mapping and management

All submissions of primary data were mapped into a survey data submissions checklist (see Photo 2) - a simple excel spreadsheet presenting submissions by site and country as an easy binary (✓ and ✗) visual reference on available guideline information and parameters (ethnicity, locality, gender, age, oral history, photographs, audio/ video recordings), as well as indication of whether the countries had participated in the CMS Dugong survey questionnaire.









CULTURAL SCOPING STUDY Checklist of files submitted													
Country													
	INDONESIA			MADAGASCAR				MALAYSIA	MOZAMBIQUE	SOLOMON ISLANDS	SRI LANKA	TIMOR-LESTE	VANUATU
Site													
Survey area													
	Ampasiranana (MAG)	Ambohitantely (MAG)	Ambohitantely (MAG)	Ambohitantely (MAG)	Ambohitantely (MAG)	Ambohitantely (MAG)	Ambohitantely (MAG)	Sika	Tagu	Angoche	Quilombo	Nitro	
2a Survey localisation	X	X	X	X	X	X	X	X	X	X	X	X	X
2b Note taker checklist	X	X	X	X	X	X	X	X	X	X	X	X	X
3a Participant list	X	X	X	X	X	X	X	X	X	X	X	X	X
3b Separate male & female FGD	X	X	X	X	X	X	X	X	X	X	X	X	X
4a Age representation	X	X	X	X	X	X	X	X	X	X	X	X	X
5a Oral history	X	X	X	X	X	X	X	X	X	X	X	X	X
6a Photos	X	X	X	X	X	X	X	X	X	X	X	X	X
7a Audio recordings	X	X	X	X	X	X	X	X	X	X	X	X	X
8a Video recordings	X	X	X	X	X	X	X	X	X	X	X	X	X
9a Post-survey questionnaire-field	X	X	X	X	X	X	X	X	X	X	X	X	X
9b Post-survey questionnaire-office	X	X	X	X	X	X	X	X	X	X	X	X	X
CMS Dugong census/eyewatch questionnaire	X	X	X	X	X	X	X	X	X	X	X	X	X

Photo 2: Excel submissions tracking sheet and first visual on completeness of survey information

This helped to keep track of submissions as well as offer a first look at the quantity and diversity of information that was received.

2.3. Methods

Majority of the information received through the survey was qualitative. Numerical data, and numerical data with descriptive information were tabulated and processed in the best way possible. The focus of this section on method provides a brief overview of the method of analysis of qualitative data that was employed.

Appendix 4 provides a brief note on qualitative analysis.

2.3.1. Analysis method

A multi-disciplinary effort was initiated in the analysis of the study – incorporating knowledge gained from experts during the secondary information collection process, the Post-survey questionnaires of the DSCP representatives, corroboration with the CMS Dugong study, etc. In addition, the active involvement of 2 researchers in the analysis process – one with a background in environment and conservation and the other from a background of research, analysis and interpretation of consumer behavior – ensured that there was a greater level of relevance and objectivity to the results.

In the case of the cultural scoping study, to ensure rigor, both the deductive and inductive analytical approaches were applied consecutively. And within each approach, different techniques were used to sift through, sort, analyze and interpret the information at hand, to derive a maximum of learnings.

The first step was to translate and transcribe all the generated content – Focus Group Discussions, Expert Interviews with the DSCP representatives, and the oral histories from village elders. To this information, a deductive analytical approach was employed using a pre-determined structure, with the themes as a guide, to organize the descriptive data.

Three different analytical techniques were followed within this approach:

- Framework technique to organize the data:** The transcripts for each site were read in detail for thorough familiarity with all the content. Taking on one site at a time and using the 10 thematic areas as a starting point, the transcript for the site was re-read noting each salient remark and collating it under its corresponding theme (see Photo 3). A note was made for each salient point on which site it came from, the gender, occupation and age, where possible and available. This process was repeated for each surveyed site, across all countries.

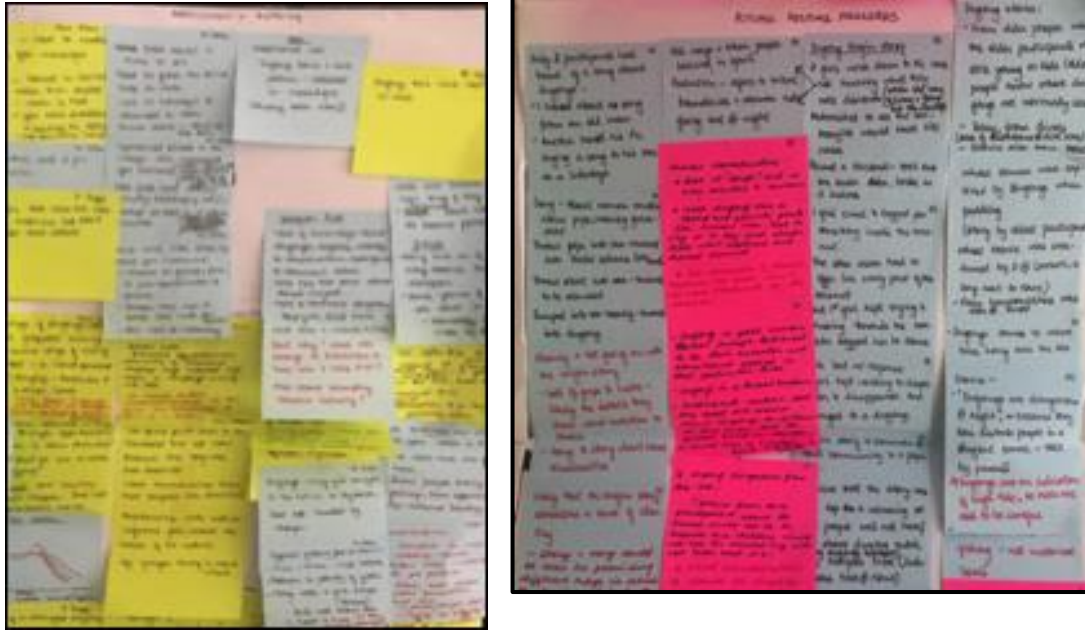


Photo 3: Examples of the process of recording salient points by a thematic area referencing the site and other details per salient point

Once all the qualitative data was indexed and charted as per the themes, by site for all countries, a combination of Content Analysis and Narrative Analysis techniques were used to decode, analyze and interpret this salient remark that was treated as a qualitative data point.

- b. **Content Analysis technique:** Data points in each theme were scanned for words, phrases and concepts that were most commonly used by the respondents, to identify patterns. Similarly, the overall site / country data was also scanned for recurrent themes. These patterns were then connected to non-verbalized aspects of the respondents (implicit data) that were known through the Participant Detail forms that were filled per site by the field researchers. The knowledge of gender, occupation, education, age, and/ or religion and the emerging patterns in the data were used to determine the differences and similarities across and within these groups, where possible. Relationships between different themes were also investigated.

Once this analysis and interpretation was completed for all countries, the Inductive approach was exercised. The thematically organized data was re-configured to represent the pattern that emerged from the participants responses (instead of using pre-determined themes) across all sites of all countries (see Figure 4).

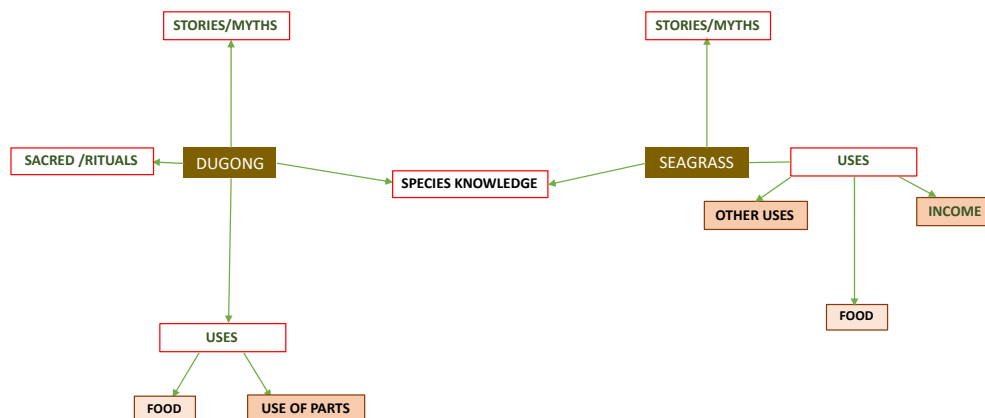


Figure 4: The emergence of recurrent themes in the remarks of the participants across all the sites in all the countries resulted in a re-configuration and linking of themes that offered the best representation of perceptions and cultural significance of the species.

Of the 10 study themes, some became merged and others has to be omitted as there was a clear lack of information or irrelevance of the theme noticed across all sites. This not only

simplified the data organization, but also facilitated cross-country learnings analysis and interpretation, leading to key learnings and a link-back to the research objective and questionnaire. Further, it offered immediate visual reference of the density of information and the similarity/ diversity in the common themes by site and across countries.

- c. **Narrative Analysis:** The cultural narratives, particularly those relating to ancestors; traditional fishing and hunting techniques; and, perceptions of the future narrated by the respondents were analyzed to understand the place and role of dugongs and seagrass in the community and its evolution. An assessment was made of the evolution of cultural codes around hunting and fishing, its evolution over time, the technique/ tools used, and overall manifestation – in changing behavior, attitudes towards these species. Further an information audit was conducted regarding the species and occupations in popular culture and a scoping analysis of the semiotics (signs, meaning, etc.) and semantics (words, language, etc.) around them.

2.3.2. Reinforcing data value

The emerging ‘red thread’ of the narrative within a site or within a country with multiple sites, was cross-checked for alignment with the CMS Dugong MoU Questionnaire data (where possible), and given context with the Oral Histories (where conducted) and Post-Survey Questionnaires (where available).

Such triangulation of the information ensured a level of consistency and reliability of information received through the survey. Where possible other parallel research was also referenced for added value.

2.4. Assessment of limitations

As majority of the data from the survey was qualitative, this section focuses on an assessment of limitations of qualitative data anticipated at large.

The biggest challenge in qualitative data is standardization and rigor. In approaching the design of this survey, all possible efforts were taken to make sure that all participating countries were given the same information and guidelines for execution (see Appendix 3 Survey pack).

Despite this it is important to note that in all the information gathered from the sites there are elements of,

- Inherently assumed contextual knowledge (familiarity of participant or study staff to situations that analyst, researcher or reader might not be familiar with)
- Moderator/ coordinator/ note-taker/ researcher bias
- Loss of detail and nuanced information in translations from local languages to English
- Errors in survey documentation due to misunderstandings, omissions and incomplete information
- Differences in approaching participants or the way the survey was conducted

Further, it is acknowledged that the value of the information entirely depended on

- the site/s chosen,
- number of participants,
- participant profile,
- how the participants were briefed,
- where the discussion took place,
- participant interest,
- how the questions were posed and perceived,
- as well as characteristics of interaction (cultural, occupational, age or gender dominance).

Best efforts were made by all teams to maintain awareness of these limitations and counter them where possible. Steps were taken to find corroborations of qualitative information that was gathered and regular cross-checks for clarity were requested where necessary in processing and reviewing information received from the sites for the cultural scoping study.

3. Results of analysis

3.1. Global summary: tabulated data

A total of 22 sites were surveyed using the questionnaire developed for the cultural study.

Table 2: Number of participants per site by country, presented by gender and survey stipulated age category

COUNTRY	SITE NAME	NUMBER OF PARTICIPANTS					
		MEN			WOMEN		
		Under 45	Over 45	TOTAL	Under 45	Over 45	TOTAL
Malaysia	Sibu	7	2	9	3	4	7
	Tinggi	5	3	8	4	5	9
Solomon Islands	Naro	6	2	8	1	7	8
Madagascar	Ambolobozokely	3	4	7	4	4	8
	Ananalava	3	2	5	3	-	3
	Male focus group 2	2	2	4	X	X	X
	Male focus group 3	2	2	4	X	X	X
	Ankazomborona	21	4	25	7	1	8
	Ankazomborona (individual interviews)	3	6	9	X	X	X
	Ironona	6	3	9	X	1	1
	Lalandaka	9	1	10	X	X	X
	Ampombofofo	3	3	6	1	1	2
	Ampasindava	5	3	8	X	X	X
	Ampasindava (individual interviews)	1	1	2	X	X	X
	Dugong Festival interviews [†]	-	1	1	X	X	X
Mozambique [‡]	Ibo- Quirimbas	1	7	8	X	X	X
	Angoche	3	5	8	X	X	X
	Vilankulos	5	3	8	X	X	X
Timor Leste	Tutuala	X	3	3	X	X	X
	Lore-1	X	1	1	X	X	X
Sri Lanka	Chavankachcheri	2	3	5	2	1	3
	Karainagar	1	6	7	X	1	1
	Moondampiddy	2	4	6	1	1	2
	Pooneryn	4	3	7	1	X	1
	Talaimannar	6	9	15	X	1	1
	Vidataltivu	3	5	8	X	X	X
6 COUNTRIES	22 SITES (44 SURVEY RECORDS)[§]	103	88	191	27	27	54

The Dugong Festival was one of the 22 sites surveyed, where two focus group discussions were conducted, comprised of participants from different communities. 11 individual all male interviews (9 in Ankazomborona and 2 in Ampasindava, Madagascar), with significant modifications to the cultural survey questionnaires, were also reviewed for content and included, where relevant. This made a total of 44 survey records that contributed to the analysis presented in this report (Table 2).

[†] The survey notes did not record any participant numbers or their details. Only one participant details are known as he was the narrator of a mythological story (55 years of age).

[‡] Note from Project Leader: *In Vilankulos case, we made the interviews in the beach - so in this case no women were in the group by the time, as fishermen were preparing to go out to the sea. But in Ibo and Angoche, women were shy to speak and usually when we have these kind of focus group for interviews they tend to point the elders or leaders of the community, and even if women are around they will keep themselves very discrete and not speak much/ and won't say anything different from men. Once I tried interviewing some women apart from the group (in another survey in Inhassoro), but the questionnaire ended up full of "I don't know" and "no answers", maybe they felt like they would need permission/approval from a man to be able to answer, or maybe they simply didn't know. I guess this can also be related to the religion background, or sometimes because they are not very used to participate in decision making processes in the group.*

[§] This includes total sites plus separate male and female survey notes, 3 separate male focus group survey records each from Analalava and Ankazomborona, 2 separate records each from Ampasindava and the Dugong Festival in Madagascar, as well as the 8 individual survey records from Ankazomborona.

3.1.1. Gender-based participation

There is less than 30% representation of women in the survey. The table above also shows that there were no separate all women focus group discussions in 18 of the 22 sites. 5 of the 18 sites show a minimum of 1 woman participant and a maximum of 3 women participants in a majority male focus group discussion. In these 5 sites, the responses or perceptions of the women are not explicitly noted. Hence, it has not been possible to note gender-based differences in the 18 sites. An attempt has been made to include women's occupational role and educational level in the 5 of the 18 sites where the data was available on women.

Most sites where separate women's focus group discussions were not conducted, field officers who organized the surveys indicated that the women in the community were hesitant to participate either out of disinterest, societal characteristics or because they did not feel they could contribute to the topic (see also note by survey leader for Mozambique as footnote under Table 2).

3.1.2. Age representation of focus groups

The guideline provided on age representation notes that "For each representative group, make sure that the age of 50% of the participants is between 20-45 and the other 50% is >46". Not all individual sites have the 50-50 age representation but overall, representation is fairly evenly distributed overall within the genders between these two age groups.

While the grouping is simplified and broad, for this scoping study it was sufficient to indicate differences amongst the younger generation and the older generation participants, as well as the dynamics of their interaction in the focus group discussions. For instance, a relative majority of the traditional stories or stories of consequence/ beliefs recorded are from participants ≥ 45 years of age, among both men and women. There is also use of phrases around information being passed on from "elders" or "ancestors" to "descendants" in discussions across sites by participants, which indicates the generational distinction made amongst the participants (irrespective of whether they are under or over 45 years of age, including in Timor-Leste where participants are 60, 70, 80 and 90 years old) and therefore highlights the importance of age in dating culture, or in understanding cultural depth and context in communities. Another example is the moderator's general comments about the focus group notes at the survey site Palau Sibu in Malaysia: *The older men were more vocal than the younger men who probably kept quiet out of respect*. This is a distinctly cultural behavior that regards the older generation to be inherently more knowledgeable than the younger generation. This, among other possibilities, could indicate the importance given in some of these communities to experiential learning than only formal education.

3.1.3. Educational profile of participants

Only participants from sites where education level data was recorded have been charted. Within these sites no educational information was provided for 8 participants. Participants include both men and women. A separate male versus female education level data was not considered adequate or robust enough to show gender based differences as the representation of women across the sites was poor.

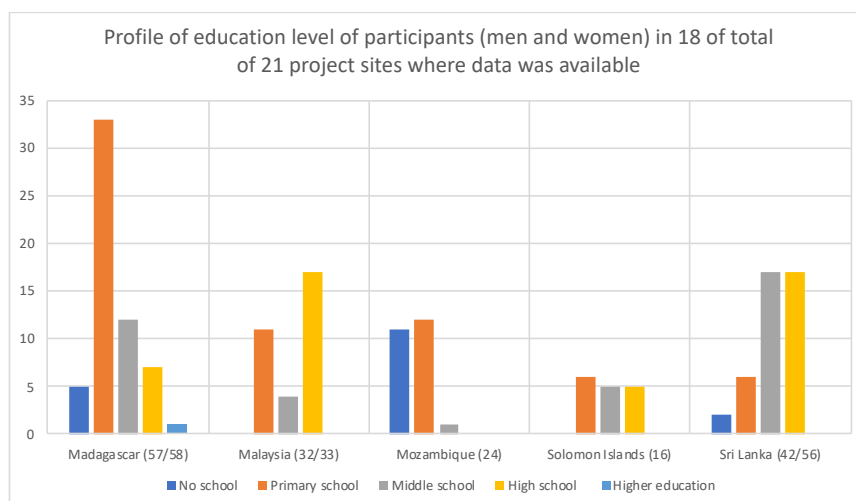


Figure 5: Profile of education level of participants (men and women combined with no age distinction) in 18 of the 22 project sites where data was available. For Solomon Islands, education level of 4 participants was recorded as secondary (not middle or high school) and has been taken to mean high school for this chart.

Total number of participants are listed in parentheses alongside the country in Figure 4. Not all sites in the 6 participating countries show education level information. No educational information was available for Timor-Leste.

Age related differences in education are evident from the survey data as the pie charts show in Figure 5. Of a total of 172 participants, the under 45 year-olds show a greater number (97) enrolled in formal education, and relatively higher numbers in overall primary, secondary and high school education, compared to the over 45 year old participants.

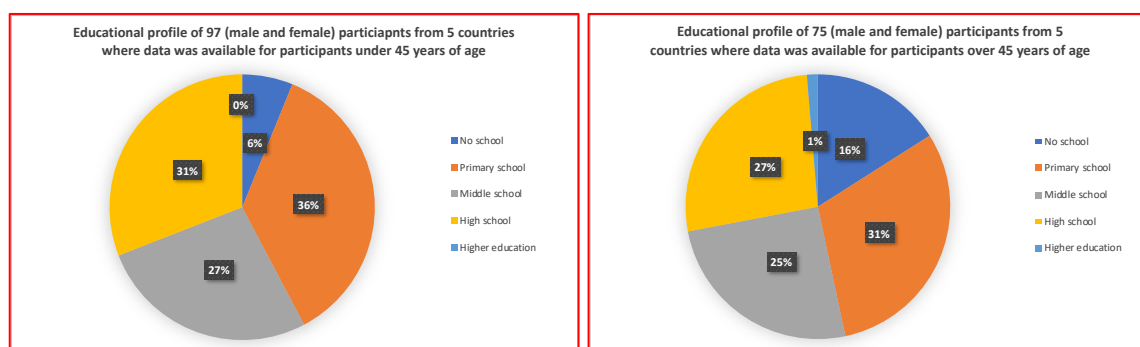


Figure 6: Difference in educational profile of over 45 years old and under 45 years old, male and female participants combined, from 5 countries where data was available

The one anomaly to this assessment is the single over 45 year old individual (woman from Madagascar) who was enrolled in University for a business management course.

3.1.4. Occupational profile

Of the 53 women who willingly participated in the survey, majority (16) of the women identified their role as housewives. Women in other professions, other than one 18 year old student, are housewives (some widowed) and mothers too, but identify by their occupation in the community.

The Table 3 below indicates that the women do not engage in any fishing in any of the sites, but may engage in multiple fish landing related activities (as seen in sites in Sri Lanka). In the Solomon Islands survey site, the women note that young girls (as young as 4-5 years old) engage in bamboo fishing along the shore. It is not understood to be considered an occupational role among the participants of this survey.

However, the survey information shows that women take on multiple roles in the community (one farmer in the Solomon Islands is also a church worker and another is also a teacher) and hold a variety

of occupations (and professions, whether community nurse, power station manager or member of the Comité Local du Parc, Homestay owners/ workers, etc.).

In two of the sites (one in Malaysia and another in Madagascar), the women participants also identify as members of the local Women's Association.

Table 3: Occupations of women (under 45 years old and over 45 years old) across all survey sites (absolute numbers)

Occupation: Women from all sites	Under 45	Over 45
Housewife	12	4
Housewife and head of womens committee	0	1
Student	1	0
Community nurse	1	0
Self employed	1	2
Farmer	7	1
Farmer and market vendor	1	1
Fish landing activity (fish sorting, net mending, fish drying, etc.)	4	4
Market vendor	3	0
Village power station manager	0	1
Teacher	0	1
Comité Local du Parc (Madagascar)	0	1
Other (homestay manager, homestay cook, homestay worker, trader)	4	4
TOTAL	34	20

Among the male participants data from sites in 4 countries (there was no data available for sites in Timor-Leste) show that majority of the participants in both age categories are fishers. This is likely due to the fact that the survey guideline required the field officers who conducted the survey to select participants that represent the fishing community and the farming community (or any one of the two occupations as they were estimated to be the major representative categories in the survey sites. This recommendation was made particularly as their perceptions of dugong and seagrass would be most relevant to the cultural scoping study). Despite this, the diversity in occupations across the sites are evident, as are their perceptions of dugong and seagrass, irrespective of occupation.

Table 4: Occupation of men (over 45 years old and under 45 years old) across all sites (absolute numbers).

Occupation: Men from all sites	Under 45	Over 45
Fisher	74	47
Farmer	3	5
Fisher and farmer	1	6
Other marine fishing related activity (ornamental fish collector, crab collector, lobsterdiver)	3	0
Comité Local du Parc (Madagascar)	15	4
Boat owner	3	4
Boatman (including resort boatman)	4	0
Self-employed	1	0
Other (village head and homestay owner, Imam and school guard, Islamic teacher, Catechist, mechanic)	3	4
Retired fisher	0	7
Elder	0	1
TOTAL	107	78

NOTE: For the purpose of this study, priority was given to the fishing occupation. The total number of men categorized by occupation does not correspond to the total number of male participants. There is a discrepancy as there was no information on participants from Dugong Festival and no information on 4 Timor-Leste participants and 1 participant occupation details were not provided in Madagascar (Ampombofofo).

Overall the Table 4 for men seems to show that the diversity in occupation among the younger age group is greater, and that the fishing occupation among the younger age group continues to be a significant livelihood across communities surveyed.

In both the women and men's occupation tables, and both age groups, there is indication that there are occupational opportunities that are explored outside of fishing and fishing related activities as a livelihood. There is also indication that the younger age groups are more likely to explore livelihoods/ occupations/ professions beyond fishing and fishing related activities. For example, it is interesting to note the greater number of under 45 year-olds in Madagascar (sites of Ironona and Lalandaka) who are part of Madagascar National Parks Comité Local du Parc. This could be an indication of an alternative livelihood opportunity amongst the younger generation.

There are more women who are self-employed than men. The tables show that the greatest diversity in occupations are among the women in the communities surveyed.

3.1.5 Recognition of species images

The number of participants who recognized the images of the species shown during the survey, is presented in Table 5.

Table 5: Tabulated data on the number of participants per site by country who recognized the images of the dugong and seagrass they were shown during the survey

COUNTRY	SITE NAME	Number of participants who recognized			
		DUGONG		SEAGRASS	
		Men	Women	Men	Women
Malaysia	Sibu	9/9	3/7	9/9	3/7
	Tinggi	8/8	5/9	8/8	-
Solomon Islands	Naro	8/8	9**/8	8/8	9/8
Madagascar	Ambolobozokely	/7	/8	/7	/8
	Ananalava	5/5	3/3	5/5	3/3
	Male focus group 2	4/4	X	4/4	X
	Male focus group 3	4/4	X	4/4	X
	Ankazomborona	/25	8/8	/25	8/8 ^{††}
	Ankazomborona (individual interviews) ^{††}	n/a	X	n/a	X
	Ironona	/10 ^{§§}	X	/10	X
	Lalandaka	/10	X	/10	X
	Ampombofofo	/10 ^{***}	X	/10	x
	Ampasindava	8/8		8/8	
	Ampasindava (individual interviews)	n/a	X	n/a	X
	Dugong Festival interviews ^{†††}	1	X	1	X
Mozambique	Ibo- Quirimbas	8/8	X	8/8	X
	Angoche	8/8	X	8/8	X
	Vilankulos	8/8	X	8/8	X
Timor Leste	Tutuala	3/3	X	3/3	X
	Lore-1	1/1	X	1/1	X
Sri Lanka ^{†††}	Chavankachcheri	40/8 ^{§§§}	X	32/8	X

^{**} Survey notes show 9 participants recognized dugong and seagrass. Only 8 participants details listed.

^{††} Assumption from notes where participants say "yes" when asked if they recognize the images of dugong and seagrass

^{††} The questions asked in the individual interviews were not the same as the cultural survey questions.

^{§§} One woman participant.

^{***} One woman participant.

^{†††} No data on the number of participants. Only one participant details are known as he was the narrator of a mythological story (55 years of age).

^{†††} In all the sites, the number of people who have recognized the dugong far exceeds the number of participants. This is explained by project leader as follows: *when the photos were shown everyone want to see it and participate. However, when we ask to interview them they hesitate, I have added the people who actively participated.* No data to show that the 8 participants are ones who recognized the images.

^{§§§} Three women participants.

COUNTRY	SITE NAME	Number of participants who recognized			
		DUGONG		SEAGRASS	
		Men	Women	Men	Women
	Vidaltativu	31/8	X	35/8	X
	Talaimannar	27/16****	X	29/16	X
	Pooneryn	51/8****	X	49/8	X
	Moondampiddy	39/8****	X	50/8	X
	Karainagar	22/8§§§§	X	22/8	X

Note: First number indicates the number who recognized images shown of the specie. The second number denotes number of participants. If first number is missing it means there was no data provided. X= no participants. For all other anomalies, please check footnotes.

Participants who are (or were) fishers or are engaged in marine related occupations are more likely to recognize the images of the species shown because of their occupation. Other likely explanations favoring recognition of species could range from relative abundance of the species, to active presence of the species in the lives of the participant community, or the effective (intra and inter-generational) transfer of formal and/or informal knowledge gathered on the species. It is equally likely that the images are familiar to some of the participants because of conservation interventions in the community.

Data on age when participants knew of the species and age at which children engaged in fishing have been discussed within the qualitative data tables section of the report. The assessment of the tables supports the speculation made above on likely reasons for visual familiarity of the species among participants.

As the survey data did not specify the age category (or educational profile) of the participants who recognized the species it was not possible to note whether there were any age related differences in the recognition of the species.

3.2. Qualitative data: Country profile sheets

The survey focused and largely probed information specifically on dugong and seagrass. Therefore the participants responses are specific to the species. In some communities these species bear more significance and in others they do not as much.

In all the sites the survey staff made sure to conduct and moderate the survey in the local language, and in some cases local dialect, to ensure comfort and ease in exchanges. Therefore all descriptive data presented here are translated versions only and may, to some degree, be open to alternative interpretations. Where there was lack of clarity in interpretation, it has been clearly noted and conscious attempts have been made to avoid actively using such information to contribute to cultural indications in this scoping study.

The synthesis of the country profile sheets by sites revealed certain commonalities across the countries around the species that are discussed below. These topline characteristics and inferences have been drawn from within the content of the qualitative data from this cultural scoping study.

In most survey sites there is a **link** between the local **language** and the **species**, whether dugong or seagrass (names of species, phrases, names of places). These have been listed in a table with details, where available.

In almost all the sites, participants share folklore, **myth** and/or **story** around the dugong on its origin and/or what it represents that are often supernatural in quality, and in most cases the communities appear to tend to humanize the species (either through identifying the similarity in its behaviors to humans or its sexuality given its mammalian features). Often the supernatural bestows “**sacredness**”

**** One woman participant.

**** One woman participant.

**** Two women participants.

§§§§ One woman participant.

to the species and therefore is often accompanied by **rituals** and/or practices that dictate a code of conduct of humans who come in contact with the species. It is important to state that stories, sacred species and ritual/practices are or were likely the case in all survey sites, including where survey notes and records account remnant expressions.

In two sites, seagrass is/ was considered **sacred** or “taboo” area . In these sites its sanctity is largely in relation to the fisheries.

The community’s **use** of the species, both seagrass and dugong, across the sites was information that was thought fundamental to present in the site schematics. Fundamental, as humans value the quality of usefulness whether as food, medicine, or even influence (such as fortune or omen, including trophies). There is a distinctive difference that appears across the sites in the relationship and perception of the two species (seagrass and dugong), to its use. The usefulness of seagrass as fish breeding and fisheries grounds bear a strong nutritional and income source inherently understood and consistently seen across all sites. Both men and women , explicitly (implicitly in a couple of cases) share this perception not just for their own generation, but also in its importance for the future (see Appendix 7). In Sibu (Malaysia) and Naro village (Solomon Islands), the survey notes indicate that there is an added recreational value of a particular species (*Enhalus acoroidis*) of seagrass fruit as a food (mostly as a snack collected by women and children). There is no indication made by participants in the survey of any economic value of this activity.

The dugong, on the other hand, does not have this same status. The survey data seems to indicate that this species likely has/had a more complex and deep-rooted influence on the communities that live alongside it. This influence could range from the community’s code of living, practical and experiential learning/ education, community interactions (amongst themselves and likely also outside their tribe/ clan), their identity (whether in language & linguistic expression, art, practices, food/ nutrition, faith and belief), specialized occupations that are now likely obsolete, among others.

The degree to which stories, rituals and uses are/were known, believed and/or practiced vary in scale from sites to site and are evident in the detail or extent of information that populates the site schematics and the qualitative data tables.

The survey notes overall show significant information on participants’ **knowledge of the species**. This has been presented in the schematic and has also served as a means of identifying whether and how the participants see the relationship between seagrass and dugongs. Some of the information is experiential, and some passively gathered from lifestyles and living alongside these species. Some of the shared information is thought to be “aided” given that conservation projects and awareness education campaigns have a presence in these sites. There is a distinction in the language and expressions used by the participants around these species that seems to indicate what the source of this knowledge is.

Synthesized qualitative data have been presented in the form of site based schematics (in the format presented in Figure 3) by country (See Appendix 6 Synthesis of post-survey questionnaires), and in tables. These presentation formats, facilitate identifying similarities and differences in perception and practices between sites and countries around dugong and seagrass.

The site based schematics in Appendix 6 present as a first level visual reference to the density of information that has been obtained from participants in each site.

The sections 3.2.1 to 3.2.6 are key interpretations and insight obtained from the site data, presented by country. The sites in each country are marked on a map to provide a basic geographical context. This is accompanied by Information on indigenous/ ethnic identity and language of the surveyed sites. This information was not collected consistently across the all sites. In all sites, the local name of the species was of interest as a first insight to perception of the species. This has been tabulated and translated for meaning where available, and possible. Following this, an assessed interpretation of the information from the sites, with broad inferences and implications have been presented.

NOTE: The communities for the survey were selected by the country project leaders. The participant data and their views referenced in this report are only of those who willingly participated in the focus groups discussions from the selected communities. All information (including age, educational or occupational profile or the respondents views) are by no means the best, or only representation or identity of the community, of the tribes in the area or the country they are from.

3.2.1. Madagascar



The indigenous ethnic identities of the participants in the 7 sites are: Antabarana, Tsimihaty and Sakalava.

The languages spoken in the 7 sites are: Antabarana, Tsimihaty, Sakalava (provincial dialects of Malagasy).

The survey responses were translated from these languages into English, and some to French.

Names for dugong and its meaning		Names for seagrass and its meaning (or sp. where known)	
Trozona	Term used for large marine megafauna, including cetaceans.	Ahitra/ Ahitra fleur	
		Ahibilela/ Ahibolela	<i>Cymodocea</i>
Lombohara/ Lomboharo	"Lombo" = Pig "Hara" = reef	Ahipano/ Ahimpano	<i>Halodule</i> sp.
Lombodriaka/ Lombodriaky	"Lombo" = Pig "Riaka"= sea	Andranimasina/ Ahidranomasina	
		Ahitrozona/ Ahotrozona/ Ahitrozo	Grass of the marine megafauna
		Filelatra	<i>Cymodocea</i>
		Mendry	Likely <i>Halophilla</i>
		Lovinjo	Likely <i>Thalassodendron</i>
		Vhitrara	
		Vico/ Viko	<i>Syringodium</i> sp.

The local name *trozona* for dugong was used in all 7 sites to identify the species by the image that was shown to the focus groups, among both men and women. This is an indication of the recognition of the size of the dugong in grouping it among marine megafauna and cetaceans. The names meaning "sea pig" and "reef pig" that were also used to identify the dugong are indications of how they are perceived morphologically and where they have been encountered. Similarly in the case of seagrass, the term "*ahitrozona*" and its variations depict the naming of the species based on the "*trozona*".

The field teams made an effort to identify the scientific names of the local names used by the participants in the 7 sites for seagrass. This is an indication of knowledge of several varieties of seagrass among the participants, some (or maybe all) of which are known/ identifiable by the scientific community, but this does not exclude the possibility of other species that may be known to the local community.

Except in Ironona and Ampombofofo, participants in all other sites were able to state the relationship or connection between dugong and seagrass.

In all of the stories and rituals the human (feminine) form and behavior of the dugong bear great significance and influence. Majority of the sightings related accounts are of a docile, pacifist, considerate creature.

At the same time, its nutritional value - in quantity and quality (protein and fat), cannot be undermined as important for a community whose livelihoods rely on subsistence living.

From all accounts in Madagascar it is clear that among the ancestors of the community, dugong hunting existed, but was likely not frequent or indiscriminate. The effort required (in its capture, killing and slaughter) of the community and beyond, was significant, both in effort and likely also cost and time. But a captured animal appears to have been treated with respect and communally used in its entirety. There is indication from the participants' notes that this would have been a rare and not a regular event. The complex series of activity that appear to precede and succeed a dugong capture indicate that there is likely to have been a markedly different occupational profile and skills of these communities at the time when ritualistic practices around the dugong were prevalent.

Throughout the sites in Madagascar, the value of the seagrass remains constant with very minor variations in perception. Often it appears that its value is obvious and did not require to be expressly stated. One point that is clear is that there is no story or myth around seagrass in sites surveyed in Madagascar.

The community's knowledge base gained through proximity to the species and the close interactions with the dugong and seagrass, do enable inherent informal, experiential learnings that are irreplaceable. It is a form of learning that is not detached from everyday life of the community and has the advantage of being ingrained to allow an ease in intergenerational transfer (through fantastical stories, myths and proverbs) as long as the full context and purpose exist.

The sites in Madagascar also are an indication of differences in dugong and seagrass perceptions across diverse occupational categories. For example, in the Ironona and Lalandaka sites, all participants were local community park rangers; in Ampombofofo, almost all participants were farmers.

What is also evident in all the sites, to varying degrees, is that the stories are waning in detail and context. The practices are recalled in scattered fragments of information, with those that have remained in some cases appearing incomplete, diluted, distorted and irrelevant. Dugong uses and all related specialized occupations are obsolete; and, the species knowledge that was learnt experientially, through practical interaction are now either lost or are re-learned (aided) without necessarily the same cultural context, naturally instinctive or traditional sensibilities. All, likely a consequence of fewer dugong interactions or its absence (encouraged also through legal mechanisms), and therefore weaker network of relationships with the species (with likely changes also to the broader community interaction).

There is indication from responses of participants in Madagascar that it is likely that the most outstanding (and simplified) information is/ can be or could be passed on effectively, particularly when the context and relevance are diminishing.

The interviews conducted with participants at the Dugong Festival show the congregation of individuals from across Madagascar of communities that know, or are curious to know, about the dugong and its habitat. It is a platform for exchange of information, old and new, a revival of accounts of ancestral practices and beliefs, a celebration of the uniqueness of having the species in their seas, and a fertile ground for developing stewardship around the species. This might be what continuity of a culturally defined practice might adapt to without all of the context and purpose, as before.

3.2.2. Malaysia



The indigenous/ ethnic identities of the participants in the 2 sites are: Malay

The languages spoken in the 2 sites are: Malay (Malaysia)

The survey responses were translated from Malay to English.

Names for dugong and its meaning		Names for seagrass and its meaning	
Duyung	Mermaid	Ramput Setu/ Setor	<i>Enhalus acoroides</i> (fruit bearing)
Dugong	Derived from <i>Duyung</i> = mermaid	Ramput Ketam	<i>Halophila sp.</i> (seagrass where there is crab)
(Sea cow)	This name was learnt recently by the men in Sibu as an alternative name for dugong.		

The English term Dugong comes from the Malay term *Duyung*, meaning mermaid. *Duyung* is how most of the participants identified the dugong images that were shown. Only the women in Tinggi referred to it as dugong. The men in Sibu recently learnt that the dugong could also be called the sea cow.

Only the men in Sibu named both the *Ramput Setu* and the *Ramput Ketam*. All other focus groups only mentioned *Ramput setu* or *setor* as the seagrass name they were familiar with. These are two different species of seagrass. The scientific names of each have been indicated by the survey lead in Malaysia. It is believed that both sites know of *Ramput setu/ setor*. This variety of seagrass bears a fruit that is eaten in Sibu. This practice is spoken of extensively in Sibu but remains only as part of a story among focus group participants in Tinggi, and only among women.

Participants in Sibu have provided significant information on their relationship with seagrass and dugongs. There are a few highlights from this site that raise important information worth noting, around religion and tradition, on value of souvenirs and the medicinal practices over nutritional use of dugong and the undervalued significance of incorporating seagrass fruit in their cuisine.

The men of Sibu appear to have a significant depth of information that they have shared around the seagrass fruit and also the variety of uses of dugong parts, compared to the women. The contribution of women in the perception and knowledge of the species is equally remarkable given their occupations might not always lead them to hold this depth of information. It demonstrates that knowledge has been gathered by the fact of living in close proximity to this environment, through personal interest in observations (as the women note) and through practical experience (as would be the case for the fishers and boatmen).

The information shared in Tinggi by women was greater than what was shared by the men. It appeared that the women retained and engaged more in the opportunities available to gather information. Among the men, from the responses to the survey, there is a mild sense of indifference to the dugong and the cultural probing. However, there is a visible sense of concern in their responses to consequences of loss of seagrass for them and for the future (children). This question appears to have

pushed them to vocalize their immediate issues of concern (and apparent helplessness) around trawlers, fishing encroachment and lax enforcement that is likely affecting their fish catch and livelihoods.

While cultural relationships to species is one of the important considerations in the broader conservation discussions, responses from the participants in Tinggi, have highlighted that there is a real and present challenge to the day to day lives of subsistence fishing livelihoods and communities that is being overtaken and marginalized by bigger systems with bigger and better accesses that need to be addressed just as urgently as the protection of species. The multiple disadvantages that subsistence fishing communities face undermine their occupation and their lifestyles, prompting a range of responses that cannot focus on species conservation causes particularly when the future of their own livelihoods are in jeopardy.

3.2.3. Mozambique



The indigenous/ ethnic identities of the participants in the 3 sites are: Koti (Angoche), Makwa (Ibo-Quirimbas) and Xitsua (Vilankulos)

The languages spoken in the 3 sites are: Ecoti, Emakwa, Xitsua and Portuguese.

The survey responses were translated from these languages into English.

Names for dugong and its meaning		Names for seagrass and its meaning	
Nvua	Fish pig (Angoche)	Eyane	Seagrass (Angoche)
Evua/ Nvua	Fish pig (Ibo-Quirimbas)	Tchane	Seagrass (Ibo-Quirimbas)
Nguluve ndjange	Fish pig (Vilankulos)	Mahata	Seagrass (Vilankulos)
Dugongo	Dugong in Portuguese	Erva marihna	Seagrass in Portuguese

Etymologies of the names for dugong and seagrass were not researched for this scoping study. But where possible, first impressions of local names and their meanings have been noted.

All three sites surveyed in Mozambique identify the dugong as being a “fish pig”. It is an indication of the use of naming by context (sea) and morphology (similarity to animals already known). This is not the first country that has the term “pig” for the dugong. In other countries and sites this morphological similarity has also been noticed and is part of the name of the animal in the local language. The use of the term fish for the dugong is likely because of the environment it lives in, its fish-like tail (caudal fin) and its ability to swim. The Portuguese term is a translation of the English “dugong”.

In the case of the seagrass, the Portuguese term is a direct translation of seagrass. In the local languages the terms for seagrass are different and their origins have not been researched. The difference in the names may or may not indicate different species, and could just be a generic term for seagrass. There is no indication from the survey to note otherwise. But this does not exclude the

possibility of other species that may be known to the local community, with different identifying names.

Only male focus group discussions were conducted in all three sites in Mozambique.

Angoche is the only site of the three in Mozambique where participants indicate the use of dugong oil for healing and dugong bones for fortune. The use of the “bones in increasing wealth and production in a farm” has not been discussed any further by the participants (how was this practiced; who officiated this practice; how successful was it considered?) and is likely stated by the fisher who is also a farmer. Depending on how widespread this belief was it could indicate the pervasiveness of the significance of the species beyond just the fishing population of the community.

There is a focus on the sexuality of the dugong (female) that appears to prompt ritualistic practices. It is not clear whether these beliefs are under the auspices of the religious institutions or are vestiges of a cultural practices that have been absorbed (officiated) parochially into Christianity and Islam.

Responses to the survey in Ibo show that there are significant (and severe) deterrents to the capture of dugong, embedded in the community. Whether this is due to broader prohibitions or are actually remnant cultural practices of the community, is not clear from the information in this survey. The dugongs’ place in the religion of the participants (Islam) is not clear either. There are also very significant quantitative nutritional value assigned to its meat which is an important consideration in a community that relies on subsistence livelihoods. In all cases it seems unlikely that the dugong would be (or would have been) thoughtlessly captured.

Overall in Vilankulos, there is a distinct focus on the species from the perspective of its influence to their fisheries activity, and particularly as a source of food (both dugong meat and seagrass for fish). There are noticeable and distinct remarks from participants on deterrence to the capture and killing of dugongs that have both a legal basis (only mentioned in this site) as well as a basis in community belief. Although there are remarks on the similarities of dugong to humans, the animals sexuality has not been raised in the remarks by the participants (unlike in the other sites) in this survey. There is no indication from the participants about the status of or views on “purification” practices and witch doctors in the context of the teachings of Christianity (the religion of the participants).

In case of the seagrass, in all three sites, the relationship lines are quite linear and simple compared to that of the dugong. The role and the value of seagrass is clear to the participants- fisheries contributing to income and food. There is particular and emphatic response to safeguarding the seagrass when asked about what are the consequences of loss of seagrass to children. There is additional insight into the observations and perceptions of seagrass beyond fisheries that are noteworthy (See Appendix 7).

In Mozambique, particularly in relation to the expressions and recollections of the custom or source story, belief in the myth and all associated rituals and practices (irrespective of the sanctity of the animal), it is necessary to also consider recent and historical influences to the seaside communities. Historical influences and displacement of people from inland towards the coast during a long period of civil war and strife likely introduced new and diverse perceptions and ways of living to original settlers of coastal communities. Further, the socio-economic status of the communities appears to have significant bearing on how they value their environment, and perceived these species in particular.

3.2.4. Solomon Islands



The indigenous ethnic identities of the participants in the sites is: Melanesian

The language spoken in the site are: Geri

The survey responses were translated from Geri language into English.

Names for dugong and its meaning		Names for seagrass and its meaning	
Maivu/ Vaivu	Dugong (Vaivu in Di language)	Buburu ni tasi	Grass in the sea or Seagrass
Daki ni Tasi	Girl/ lady from the sea. This also applies to mermaids		

Some of the members of the Naro village (including some of the participants) are from the Kidipale tribe- the tribe of the two girls- who identify as being from the line of the dugong.

In the two languages (Geri and Di) the term for the dugong indicates a human connection.

The male participants provide significant detail on different varieties of seagrass and where they have encountered them. The field staff have noted participant remarks on the images of seagrass shown:

Thalassodendron ciliatum -No other names.

Halophila ovalis – located at Suva near mangrove.

Halophila decipiens – Present but not many.

Cymodocea serrulata and *Cymodocea rotundata* –Many small ones at Kochichi. Lay like carpet.

Cymodocea rotundata – Present in front of village.

It is not clear if *buburu ti nasi* is a generic term for all seagrass varieties.

It is clear from the source story shared by the participants in Naro village that it has a close bearing to the code of conduct in a community.

There were many stories, traditional and contemporary, narrated by the participants throughout the survey among both men and women. Some of these stories extended to the personality of the dugong or characteristics of seagrass, and many appear to have relevance to day to day village life and expressions. This seems to suggest a community that continues to have strong oral traditions.

Generally, men were much more detailed, descriptive and articulate than the women in this survey. Men seemed to speak in terms of practical experiences and learnings, and often in parables. This is likely because a lot of what they said was from the experience of being out on the sea, fishing and depending on the sea for a livelihood, as well as because some of the men were from the Kidipale tribe, a tribe which has a very close link with dugongs. In this regard, Naro village is unique in its perceived relationship to dugong due to the presence of members of the Kidipale tribe in its

community. What is certain, is that this relationship is not representative of all members of the Naro village community or that of the Solomon Islands at large. The Fisheries Law passed in August 2018 that prohibits fishing, retaining, possessing, buying, selling or exporting dugong is clearly not drawn from tribes and communities that revere the species.

The relationship of these custom or source story and beliefs within the ambience of the predominant Christian faith in Naro and elsewhere in the Solomon Islands would be important to understand. The representation of these custom or source story and the land ownership codes in the national or regional legislation would also be an important relationship to consider. There is significant literature, for Pacific Island countries on how different tribal beliefs influence land and sea tenure systems, ownership and other rights and undertakings (Maffi & Woodley 2010, Aswani et al. 2017). Apart from the remark here by participants no further information particular to this tribe or village has been shared within the survey. Further, the accounts on the consumption of dugong meat has led to the insight that inter-tribal marriages do occur between tribes who do, and those who do not eat dugong meat. Whether there is a rule, ritual or code in relation to it, is not known from this survey. This diversity in tribal culture would help to add to the understanding of the dynamics of designing laws and their implementation (enforcement/ compliance, etc.) effectiveness, particularly in relation to species conservation, as it seems likely that these tribal codes and rules are administered and observed with some sanctity.

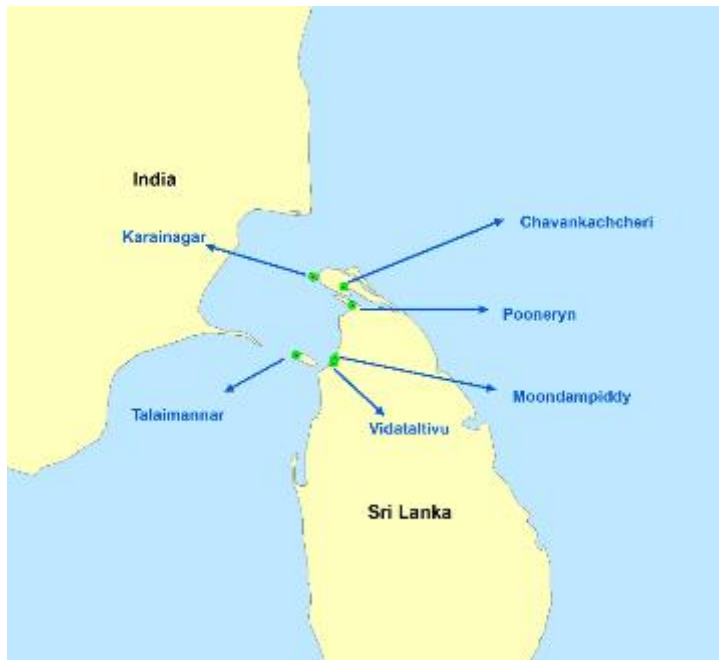
There is a noticeable level of insight amongst the participants, particularly men, into the species and its environment that has likely prompted the comment “ *Before there were less threats to the dugong, now there are things that destroys their lives such as erosion*” (See Appendix 5). It demonstrates a sense of understanding around threats to the marine system as well as its impact on their fisheries, even if not explicitly expressed.

As in Sibuyan, Malaysia, seagrass fruit are consumed here too. But here they are collected as a snack mostly eaten by children. Whether the species of seagrass that bears fruit that is consumed, is the same as the one in Malaysia (Sibuyan) would be worth checking. In either case, the fruit has no economic value assigned to it.

The medicinal use of *Thalassodendron ciliatum* a species of seagrass mentioned by the participants (“*Seagrass leaf of Thalassodendron ciliatum is used as sting medication*”) is of particular interest to note as a recently published article in the Journal of Medicinal Chemistry Research (Abdelhameed et al. 2018) identifies cytotoxic and anti-inflammatory properties of this species. Another generic remark of the participants that broadly bears value is the remark that seagrass have a cleaning property in the sea. Although this is not directly in reference, several scientific papers have studied seagrass (*Cymodocea* and *Halophila*, species relevant to Naro, Solomon Islands) as first level bioindicators and bio-accumulators of trace metal contamination of coastal areas, which in a rudimentary sense are relatable. The consequences of this information, however, are much more significant with regard not just to impact on health of seagrass and transfer of the trace metals through the food chain, but the land-use practices contributing to erosion and pollution.

Overall, there is important potential for TEK leads to explore given the information noted particularly from this site in the Solomon Islands through the cultural scoping survey.

3.2.5. Sri Lanka



The indigenous/ ethnic identities of the participants in the 6 sites are: (Likely Sinhala (Indo-Aryan) and Dravidian)

The languages spoken in the 6 sites is: Tamil.

The survey responses were translated from Tamil into English.

Names for dugong and its meaning		Names for seagrass and its meaning (or spp. Where known)	
Kadal pandi	Kadal = Sea pandi = pig	Kadal pul	Kadal = sea pul = grass
Averia	(cattle in Tamil and Sinhala)		

Overall the survey notes from the 6 sites are almost identical in wording, with very slight differences in detail, of the same perspectives, on the use and knowledge of the species. Chavakachcheri, Talaimannar and Vidaltivu are grouped in one survey synthesis. Moondampiddy and Pooneryn in a second synthesis and Karainagar is the last site on its own with some marginally different information. The groupings should not be taken to indicate similarities related to the proximity of the sites (as this is not the case as can be seen from the locations of the sites on the map), but are entirely based on the recorded, translated survey notes received.

The communities in these 6 sites are of different origins (likely Tamil Indian and Sinhala) and represent different belief systems whether Hindus, Christians, Muslims, and likely also a few Buddhists (**Communication from the project lead:** *In these areas you don't get many Sinhala Buddhist people, Some of the Christians are Sinhala Christians*). Given this, it appears that the survey likely presents partial information for sites that can be understood to be complex cultural communities with multiple influences in the likely perception and use of the species.

The term for dugong in 5 of 6 sites in Sri Lanka is “sea pig”. In Karainagar, this animal is called *averia* which appears to be a broad term for all cattle in both Tamil and Sinhala. Etymologies were not researched in detail for this scoping study and hence the English translation of this term has been included in parentheses.

5 sites used the same term for seagrass. (*kadal pul*) while in Karainagar it appears that it was identified as seagrass (the English term).

Separate male and female focus group discussions were not conducted in the sites. One site is all male, but all other sites have between 1-3 women in a majority male representation in the focus group discussion.

Across all sites it is an economic imperative that appears the strongest drive to hunting and killing of dugongs as well as the valuation of seagrass. No religious or mythological influences or any form of sanctity or divinity are extended to the dugong or to the seagrass in its use. The link that the mythology makes between seagrass and dugong in all the sites is not indicated in the participants knowledge of

the species. This could be an oversight given the obvious nature of this relationship, but at the same time the despair of the participants on their fisheries due to loss of seagrass is not extended to dugongs.

There is an overall perceived consequence of the economic challenges overtaking any cultural or religious beliefs.

There is no humanizing of the dugong in Sri Lanka. In fact the dugong has remained as an animal even in mythology. As it is not a main character in the mythological stories could be another reason that any perceived characteristics of the dugong through the Hindu stories are of no consequence.

3.2.6. Timor-Leste



The indigenous/ ethnic identity of the participants in the 2 sites is: (Likely Timoran (Papuan and Chinese) & Malaysian branch of Polynesian)

The language spoken in the 2 sites is: Fataluku

The survey responses were translated from Fataluku into English.

Names for dugong and its meaning	Names for seagrass and its meaning (or spp. Where known)
Tahi Kuca	Tahi foe
Iltem ro'	Varatasa
Tahi pai	Tahi foje

The two sites rest in the Nino Conis Santana National Park in Timor-Leste.

There have been no details provided on the meanings of the different names for dugong and seagrass. *Tahi* likely translates to sea. *Foje* likely means grass. There is reference in a couple of statements from participants on horses and pigs in relation to dugong. It is likely that one of the names of the dugong could mean horse or pig in Fataluku. This could not be verified any further within the confines of this study.

The first two names in the table for dugong and seagrass were stated in Tutuala village and the names in the last row of the table, for both dugong and seagrass, was used in Lore-1 village.

Only male participants were interviewed in Timor-Leste

The cultural survey questionnaire was modified including some questions being removed. These changes to the questionnaire could have been made due to sensitivity reasons, but there is no indication from the field office of the reasons for this change.

The sites selected for the survey are in a National Park. This likely influences the extent of information shared by the participants. It also appears that one site has the seagrass variety (*Varatasa*) that

participants claim dugongs eat, that the other site does not, which likely affects encounters as therefore perception around the species.

The sparse information in the two sites is likely also due to the small number of participants. There is relatively more information in the site with more participants- which is what was expected when designing this focus group discussion, where participants prompt each other to share information.

Although there is sparse information from the survey. If there had been more information, it would have been possible to draw some similarities and distinctions in the information around morphology and a behavioral aspect of the dugong expressed by the participants in Timor-Leste with other sites in other countries.

Demographic information for Timor-Leste through this survey was not available to help indicate dynamics or transmission of cultural information.

Timor-Leste is a young nation with significant colonization history that surely has influenced its culture and likely also conservation sensibilities of the ethnic communities. This, however, is not reflected in the information received on the cultural survey. The survey data also does not reflect the information gathered from a DSCP document that mentions the *Suco* Regulation which is described as the traditional law for community based management of marine protected areas.

3.3. Cultural data triangulation

As not all of the sites in participating countries are represented in the CMS Dugong MoU Questionnaire, Oral Histories and Post Survey Questionnaires, and as an extensive literature search was not possible within the confines of this scoping study, only a limited triangulation of data was possible. However limited, and not exhaustively analyzed, this information still presents a strong case for the significance of this process as well as the potential within this study for exhaustive triangulation, given time.

Presented below are the four sources of data that were reviewed for alignment and context to the results of the analysis of the content of the Focus Group Discussions. They have been presented by sites of countries where the data was available.

3.3.1. CMS Dugong MoU Questionnaire

The CMS Dugong MoU questionnaire were conducted as individual interviews of male fishers that were extensive in coverage but largely binary/ tertiary in response characteristic, with opportunity to cover brief detail, and little time or space in execution for extensive descriptive accounts given the expanse of information covered and length of the questionnaire.

The CMS Dugong MoU questionnaire is very different in its primary focus, its approach, format and response characteristic in comparison to the cultural scoping study. Because of this, the CMS survey was the ideal cross-reference to note overall alignment of information in sites that overlapped with the cultural survey, or broadly for a country.

The CMS Dugong MoU Questionnaire was reviewed and 13 questions were identified that bore relevance to and could likely support or strengthen responses received in the cultural scoping survey.

The requested data was provided by the CMS Dugong MoU Secretariat in excel spreadsheets. In light of time constraints, however, only responses to question 43 (see Photo 4), the most directly relevant question, were consulted.

CMS Dugong MoU questionnaire responses were only available for 5 of the 6 participating countries. There was no data available for Timor-Leste.

Photo 4: Screenshot of question 43 of the CMS Dugong MoU questionnaire

☐ 40. It is illegal to (intentionally) kill a dugong? Yes ☐ No ☐ Don't know ☐

What about by accident (maybe caught in a net unintentionally)? Yes ☐ No ☐ Don't know ☐

☐ 41. Are any areas routinely / periodically patrolled? Frequently ☐ Infrequently ☐ Never ☐ Don't know ☐

☐ 42. If yes, are penalties ever imposed? Frequently ☐ Infrequently ☐ Never ☐ Don't know ☐

☐ 43. Are there any local customs, beliefs, legends or rituals or stories related to dugongs? Yes ☐ No ☐

If yes, please describe: _____

Where / from whom did you hear this? _____

☐ 44. Additional stories / incidents you wish to report: _____

Data from the questionnaire for the five countries have been presented in summary tables below along with a brief comment on the alignment with or insight to the cultural scoping study survey. While the age of the interviewee was also tabulated against responses, it was not possible to comprehensively assign any insights or trends to age related perceptions within the CMS Survey within the confines of the cultural scoping study.

3.3.1.1. Madagascar

There were no overlap of any survey sites between the two surveys. The Diego region (location of Ambolobozokely and Ampombofofo cultural scoping study survey sites) is covered in the CMS questionnaire but there were no comments from the interviewees on question 43. The CMS questionnaire summary prepared for Madagascar (see Table 6) represents the Southwest Region, a region that was covered in the cultural scoping survey but with no overlap in sites.

Table 6: Summary of CMS Dugong MoU questionnaire response to question 43 for Madagascar (Southwest Region)

Country	State	Age	Occupation	Gender	Notes
Madagascar*					
Q43: Customs, beliefs, legends, rituals, stories		48	Fisher	M	Before being in contact with dugong, wrap the head, sex and the bones are returned in the sea, ask to get other dugong in the next catch (South West Region, Sarodrano).
		48	Fisher	M	
		54	Fisher	M	The rostrum and the ventral side was wrapped with linen before slaughtering the animal; all the bones were returned to the sea, in Ampasindava (Southwest Region, Mahavatse)
		54	Fisher	M	
		54	Fisher	M	
		52	Fisher	M	The head and the ventral side was wrapped with linen to avoid that people were amazed (Southwest Region, Antispoke) Done by the ancestors
		42	Fisher	M	
		29	Fisher	M	
		38	Fisher	M	
		38	Fisher	M	It is taboo to look at the dugong so the body had to be wrapped in Bevohitse. (Southwest region, Bevohitse)
		50	Fisher	M	
		49	Fisher	M	
		49	Fisher	M	
		49	Fisher	M	Dead dugong should be wrapped (Southwest Region, Lambohara)
		41	Fisher	M	
		40	Fisher	M	
		44	Fisher	M	
		46	Fisher	M	The body should be wrapped because villagers may confound it with pig, while many of them don't eat pig. The bones have to be returned to the sea for having chance for the next hunting, know from the ancestors (Southwest Region, Bevato-Belavenoke)
		66	Fisher	M	
		55	Fisher	M	
		46	Fisher	M	
		42	Fisher	M	The body should be wrapped because the sex of the female is similar to those of woman. (Southwest Region, Andavadaoka)
		51	Fisher	M	
		57	Fisher	M	
		39	Fisher	M	
		37	Fisher	M	
		52	Fisher	M	
		61	Fisher	M	
		71	Fisher	M	
		53	Fisher	M	
		42	Fisher	M	
		24	Fisher	M	
		48	Fisher	M	
		52	Fisher	M	

There is an overall alignment in the information from the Southwest Region in CMS notes on cultural beliefs and practices to the details of rituals and practices recorded in the cultural survey. The only difference being that some of the interviewees in the CMS survey note that they do not eat pigs and the likeness to pigs as the reason for the animal to be covered. This was not picked up in the sites where the cultural survey was conducted, likely due to cultural study's focus on ancestral rather than contemporary practices, or simply different information from different sites. But the influence of language- in this case the influence of religion with respect to the name given to the marine animal, and a likely ritualistic cultural practice adapted within a religious system, are characteristics that have, at large, been noticed in other cultural survey sites as well, cannot be disregarded.

3.3.1.2. Malaysia

There were 5 CMS Dugong MoU questionnaire interviewees from Palau Tinggi, and 3 from Palau Sibul. There were no responses from interviewees in Palau Tinggi to question 43. Two of the three interviewees from Sibul present a response to question 43 and they were found to be in alignment with that seen in the cultural survey.

As the number of interviewees representing Palau Sibul and Palau Tinggi was small, all responses to question 43 from the Johor Darul Takzim sites were tabulated (Table 7). The story and significance of the seagrass fruit that was noted in both Sibul (men and women) and Tinggi (women only) was also remarked by several of the interviewees.

The perceptions of being scared of the dugong and note on bad luck recorded amongst male participants in Tinggi are a sentiment somewhat represented overall in some of the responses of interviewees in the CMS survey.

Interestingly, there is slightly more insight (albeit brief) on dugong tears in the CMS survey than in the cultural survey. This is significant as this triangulation has provided an extended context to cultural information gathered through the cultural scoping study.

Table 7: Summary of CMS Dugong MoU questionnaire response to question 43 for Malaysia (Johor Darul Takzim)

Country	State	Age	Occupation	Gender	Notes
Malaysia	Johor Darul Takzim	48	Fisher	M	Humans eat seagrass fruit ("stu"); Pregnant women crave it turn into dugongs.
		50	Fisher	M	
		27	Fisher	M	
		65	Fisher	M	
		48		F	
		35	Fisher	M	
		50	Fisher	M	It is a curse
		52	Fisher	M	
		35	Fisher	M	
		65	Fisher	M	It is actually a woman
		79	Fisher	M	
		62	Fisher	M	
		61	Fisher	M	Dugong tears; love potion; collected in moonlight
		66	Fisher	M	
		61	Fisher	M	
		61	Fisher	M	
		67	Fisher	M	
		64	Fisher	M	Dugong as guardian
		65	Fisher	M	
		64	Fisher	M	
		68	Fisher	M	
		64	Fisher	M	
		55	Fisher	M	Dugong brings bad luck
		52	Fisher	M	
		48		F	
		38	Fisher	M	
		67	Fisher	M	
		52	Fisher	M	Similar to humans, so do not eat it
		30	Fisher	M	
		61	Fisher	M	Lives in pairs. Live as a family, move together (found dead together)
					Cannot be mistreated

3.3.1.3. Mozambique

Vilankulos was the only one of the three sites of the cultural survey was covered in the CMS dugong MoU questionnaire (Table 8). Overall the responses of the interviewees are similar to the cultural survey participants with noticeable alignment being in the belief that dugongs show where fish are.

The other distinct alignment in both surveys is the reasons for deterrence in the capture of dugongs. The legal reasoning for the deterrence is recognized in both surveys as are the community beliefs to the deterrence. This stands in support of what was noticed in Vilankulos that was unique and not remarked in other sites in the cultural survey for Mozambique.

Table 8: Summary of CMS Dugong MoU questionnaire response to question 43 for Mozambique (Vilankulos)

Country	State	Age	Occupation	Gender	Notes
Mozambique	Vilankulos	22	Fisher	M	They help man show the best roads (fishing areas?)
		40	Fisher	M	Helps the man and it shows the channel (fishing areas?)
	Q43: Customs, beliefs, legends, rituals, stories	48	Fisher	M	"at a long time your fishing was not prohibited but today they are conserved by the state" (Is this to say that dugong were hunted before? Is this a statement expressing discontent?)
		37	Fisher	M	"who fishes dugong suffers consequences"
		29	Fisher	M	Forbidden to kill dugongs because they indicate where the fishes are
		31	Fisher	M	Dugong protect against turtles (??)
		61	Fisher	M	Forbidden to capture dugongs

3.3.1.4. Solomon Islands

As Naro village was not covered as a site in Solomon Islands, the closest regional site – Honiara, Guadalcanal responses, have been tabulated from the CMS Survey (Table 9).

The cultural survey recognized the unique perception of dugongs in Naro, particularly among members of the Kidipale tribe, that was not thought representative of all of the Solomon Islands. As no other site was surveyed for cultural information, the comparison with the data from the CMS survey provides some important alignment to insights noted in the country inference section for Solomon Islands. It is likely that there is no single story of the dugong that represents the Solomon Islands, that there are distinct differences in the custom or source story stories of different tribes that likely determine the differences in perception of the dugong, and likely also influence community codes of living. The one noticeable commonality between the two surveys is that the origin of the dugong is attributed to a female human.

Table 9: Summary of CMS Dugong MoU questionnaire response to question 43 for Solomon Islands (Honiara, closest region to Naro village)

Country	State	Age	Occupation	Gender	Notes
Solomon Islands	Honiara/ Guadalcanal	45	Fisher	M	Yes-a woman who jump into the sea ashamed of her brother. Dugong always stay two-by-two unless they got a baby
	Q43: Customs, beliefs, legends, rituals, stories	50	Fisher	M	A woman jumped into the sea change into a dugong
		60	Fisher	M	
		48	Fisher	M	A woman jump and turned into a dugong at Poposa area
		38	Fisher	M	
		20	Fisher	M	
		55	Fisher	M	A woman ashamed of their brother jump into the sea has change into dugong

3.3.1.5. Sri Lanka

There was no other site than Talaimannar that was common to both the CMS and Cultural surveys for Sri Lanka. There was no responses recorded to the VMS Dugong MoU questionnaire's question 43 in any of the sites in Sri Lanka to be able to compare or validate the data form the cultural scoping study.

3.3.2. Oral Histories

The primary purpose for the collection of oral histories from the oldest member of the community , an Elder, was to identify the presence of intergenerational narratives around the dugong and seagrass.

There were a total of 3 oral history transcripts that were received through the cultural scoping survey. One from Madagascar and two from Malaysia.

3.3.2.1. Madagascar

The account of the 103 year old Elder from Ambolobozokely in Madagascar supports and adds further detail to remarks recorded in the focus group discussions across majority of the sites in Madagascar on how dugongs are perceived as well as the effort, rituals and practices surrounding dugong capture

and slaughter. A key remark of the Elder attributes the lack of respect of tradition that has led to the disappearance of the dugong.

There are significant leads presented in the Elder's account on the community's traditional ecological knowledge (TEK) that are worth consideration for further research.

NOTE: There are restrictions advised on the dissemination of the transcript from the Elder and therefore this oral history is not available to those outside the cultural scoping study team and is only available for reference for the purpose of this study.

3.3.2.2. Malaysia

Two oral accounts were submitted from Malaysia. One from an elderly man (an *Imam*, a religious head) in his 70's from Palau Sibu and the other a 72 year old woman from Palau Tinggi. Both accounts add further insight to the data from the focus group discussions in the two sites.

In both sites the dugong is known by its local name *duyung*. The term dugong appears to have been learnt through conservation interventions. From the oral account in Palau Tinggi it appears that the *duyung* is perceived differently from the dugong. While the *duyung* invokes stories and certain behaviors, the perception and behaviors around the dugong appear to be more recently learnt ("*...dugong cannot be eaten but he Duyung can be eaten*").

The story narrated by both elders in the two sites further demonstrate that the *Enhalus* fruit is at the center of the story. There would be no story without it. It could be said that the story has survived, and therefore the community's relationship with the *duyung*, only because of the seagrass fruit.

Both elders accounts demonstrate key relationship characteristics between the community and the species - both dugong and seagrass. They offer significant context for designing tailored conservation interventions.

The complete accounts of the oral histories are presented in Appendix 8. Also presented in the Appendix is a compilation of the stories, songs and practices unique to communities from the 6 participating countries, drawn from the focus group discussions. This Appendix is available on special request from the DSCP Coordinator until FPIC's have been obtained for some of the content from certain countries.

3.3.3. Post-Survey Questionnaires

There are two post survey questionnaires each with a different value to triangulation as explained below.

Post survey questionnaires were only received for three countries – Madagascar, Malaysia and Mozambique. A full tabulation of the responses to the two questionnaires have been presented as separate tables in Appendix 6.

The Post-Survey responses were reviewed and synthesized after the site/country analysis was conducted, and inferences documented. This was done to avoid any bias in the perception of the analysts from the perception of the moderators and notetakers on the information from Focus Group Discussions or broader context of the site and country. This allowed objectivity in identifying alignments and divergences on the documented inferences.

The gist of the information, particularly that which broadly relates to, supports or contextualizes insights from the sites, has been highlighted here.

3.3.3.1. Moderators and Note takers

The responses of Moderators and Note takers provide insight to the reason why the site was chosen. This provides an informed reference to the setting of the community, and perception of the field staff on the community. The responses were of particular value in identifying alignment of site specific inferences made during analysis to the assessments of the field staff of the communities they surveyed and are familiar with.

- The sites were chosen because the country office that conducted the surveys had been engaged with the community in the site for a few years, at least, through DSCP, or earlier, through other research and outreach programs.
- The sites were known to either historically have been or are at present (the last remaining) hotspots for dugong and its specialized habitat.
- One marked difference in field staff perception that is worth highlighting, that significantly diverges from inferences made through the analysis was in Ironona and Lalandaka in Madagascar. The field staff express certainty on the amount of traditional knowledge of the fisher participants from these sites (compared to other sites), whereas the analysis showed otherwise.
- Majority of the community activity across the three countries are marine related, with the predominant occupation historically and/or at present being fishing, in most cases subsistence fishing, with the activity being male-dominated.
- There is a range in the economically active population of surveyed sites (See Table 10) that was provided by site, where available. Such data would offer additional context to cultural information, when adequately elaborated and studied further, on, for example, the age structure of the population, indicate the occupational health and status of the community (i.e., viability of occupations, occupational residents and migrants, etc.) among others. This would be equally useful in profiling the communities for broader conservation and development activities. For the present, Table 10 shows the marked difference in the participation of women in economic activities, albeit a relative consistency across the three countries.

Table 10: Information from the post survey questionnaires on the economically active populations in the surveyed sites

Site	Economically active population (%)	Male and female component of the percentage	
		Male	Female
Ambolobozokely (Madagascar)	-	-	-
Ampombofofo (Madagascar)	-	-	-
Ampasindava (Madagascar)	52	70	23
Ananalava (Madagascar)	55	75	25
Ankazomborona (Madagascar)	40	65	20
Nosy Hara -Ironona and Lalandaka (Madagascar)	-	-	-
Palau Sibü (Johor, Malaysia)	29.63	79	21
Palau Tinggi (Johar, Malaysia)	40.7	87.3	12.7
Angoche (Mozambique)	74	-	-
Ibo-Quirimbas (Mozambique)	64	-	-
Vilankulos (Mozambique)	72	-	-

- In all sites the transfer of traditional knowledge has been noted as being passed down either through stories, lifestyle or practice, from ancestors and Elders to the younger generation, as a norm. All three country sites, however, express differently but remark equally that this traditional knowledge is diminishing due to change in or loss of context (absence of species or rare encounters with species, regulatory deterrents, change in occupations and lifestyle, etc.). This is consistent with inferences made in many survey sites in the analysis, not just in the

Madagascar, Malaysia and Mozambique. Often this sentiment was plainly stated by the participants or implicitly suggested in the focus group discussions and have been recognized in the analysis.

- In all three countries, the field staff have identified specialized persons and/or institutions, and disciplines (history, sociology, anthropology, etc.) as those that would add value to comprehensively understand the context of the sites under study. This is also the understanding that was highlighted at the stage of the development of the cultural scoping study.

A tabulated synthesis of the field staff responses of value to the cultural study have been presented in Appendix 6 for reference.

3.3.3.2. Field Office

The Field office responses to the post survey questionnaire offer a broader country perspective to the cultural information from the sites. Again, only 3 countries submitted the post-survey field office responses – Madagascar, Malayaia and Mozambique. There are two different organizations that provided responses for different groups of sites in Madagascar (C3 for Ironona, Lalandaka, Ambolobozokely, and Ampombofofo; MIHARI Network for Ampasindava, Ananalava , and Ankazomborona). The tabulated synthesis of responses presented in Appendix 6 note the contributions of the two organizations separately.

In Madagascar, the response to political, historical, infrastructure development considerations have been expressed in terms of existing park establishments, regulation mechanisms like “Dina” and other collective community activities and initiatives. In terms of cultural transmission, however, following the mention of divergence in perception noted in section 4.3.3.1, this cross-check raises the need to delve deeper into understanding whether what the survey shows (sparse and scattered remnants of descriptive cultural data amongst participants, particularly from Ironona and Lalandaka) in terms of the divergence is, in fact, real and if so, why and what are the factors contributing to it.

Extensive historical context offered for Mozambique is useful in adding to the complex dynamic of the cultural patterns and profile noticed in the sites of the country. Among the three sites, Vilankulos’ Bazaruto National Park was established as early as 1971; Ibo that sits within the Quirimbas Archipelago National Park was established in 2002 and Angoche is within the Primary and Secondary Environmental Protection Area that was declared in 2012. It is interesting to perceive a preliminary understanding, likely a recurrent theme across most countries, combining this historic and development information from the post-survey questionnaire and what was gleaned from the cultural survey data in site schematics. It can be said that:

- There are greater dugong numbers in protected areas established early on (as in Vilankulos compared to Ibo and Angoche))
- There are more record of sightings by participants in areas that have been protected for longer (Vilankulos compared to Ibo and Angoche)
- There is regulatory awareness in the older protected area (Vilankulos compared to Ibo and then Angoche) likely because of longer period of educational and awareness activities?
- There has allowed a higher tourism profile and therefore economic advantage in Vilankulos compared to Ibo and Angoche.
- There are fewer cultural nuances in Vilankulos compared to Ibo, and in Ibo compared to Angoche.

Following from this, the remarks of the field office to the inferences from the cultural survey sites show significant alignment in leading towards the same question: “which factor plays a major role, or a better long-lasting role, in protecting the species- traditional knowledge and beliefs or legal frameworks that protect the species, or the right combination of both?”

Similarly in Malaysia, the spiraling decline in catch, technological changes to fishing techniques, development of coastal infrastructure, and the promise of greater economic opportunities are

resulting in increasing the disconnect between the inhabitants and the environment they knew and relied upon. This impending, if not already apparent challenge was picked up in the response of the fishers, particularly from Palau Tinggi. The field office response aligns with what the country inference highlights: “change in livelihoods, adapting to a changing socio-economic landscape, is changing (or depleting) traditional knowledge and practices. It is driving the inhabitants further away from the environment they know, have relied on and continue to rely on for the present. Does it help the species if they are no longer part of the culture of the coastal inhabitants? “

Whether anomalies or alignments, the ability to contextualize, cross-check, strengthen or question perceptions and inferences is a valuable technique in this qualitative analysis that has served to build and strengthen the knowledge base of the cultural survey.

All countries equally identified the importance of a cultural study in contributing to a comprehensive approach to the conservation of the species. They have provided suggestions for valuable applications of such a study as well as expanding the remit of any future cultural study to plug gaps identified, make the effort multidisciplinary, and improve visibility of such information to allow better and guided engagement of the international conservation community (See Recommendations).

3.3.4. Corroborating literature

There was a limited amount of literature researched in-depth for triangulation given time constraints. However, some of the indications from sites on medicinal use of seagrass, seagrass as a bio-accumulator and indicator lent themselves to some known and easily identifiable material on research platforms (they have been raised within the sites where such uses have been recorded).

In relation to land ownership, tribal governance, historical and traditional influences including matriarchal/matrilineal characteristics of some tribal societies particularly in the Pacific Island countries, and their influences to habitat protection and conservation of species at large has been prolifically discussed in literature. This was found to be particularly pertinent with reference to the Solomon Islands.

There is ample potential to corroborate traditional ecological knowledge, including participant insights to biology and behavioral characteristics of dugong, from scientific literature. There is equal potential, in published literature, to substantiate inferences made on the influence of species on the socio-cultural and socio-economic codes of communities; the differences in behavioral influences of culture, religion, economy and technology in relation to the protection of the species.

A full list of references are presented at the end of the report.

3.4. Qualitative Tables

Five significant descriptive (some quasi-qualitative) responses were tabulated. These tables provide context to the country profile sheets. These are:

- Age at which participants first knew of dugong and seagrass
- Age at which children (current generation) engage in fishing activities
- Fishing/hunting techniques and perceptions on the future of the occupation
- Summary of responses on “What do you think will happen if dugong and seagrass disappeared?”
- Summary of responses for “What would your children lose if dugong and seagrass were lost?”

Note: There is no data for Timor-Leste as the questionnaire was modified, and there were no responses recorded to these specific categories of questions.

The responses of participants (separately presented for male and female where data is available) are to the survey questions from the submitted survey sheets. Age based responses could not be collected as the survey notes did not specify participant age to the responses.

The first two of the listed tables (Tables 11 and 12) are presented along with a brief note each on the likely insight the data offers. In the case of the table on fishing and hunting techniques, and future of the occupations (Table 13), inferences of participants responses are presented. Whereas Table 14 and Table 15 present a bulleted summary of responses in the words of the participants. Perceptions of men and women are presented alongside each other to show gender differences in information.

Appendix 7 presents a complete record of responses of participants, both men and women, from sites in all the participating counties where information was available on these topics.

3.4.1. Age at which participants first knew of dugong and seagrass

Majority of the responses in Table 11 show that the participants knew of the species having heard of them from Elders and/or from having observed or encountered them when young, or while at sea. In all cases this is a representation of the influence of the species in the lives of the community, the proximity in living alongside the species as well as a function of their livelihoods. Compared to women, more male members of the community have seen a dugong which is largely attributable to their occupation as fishers, unlike in the case of the women of the community. More women than men have recently (last 2-3 years) known of the species. But both men and women who have recently heard of the species are from the younger generation.

Recognizing change within their lifetime is significant as seen in Malaysia (Palau Sibu) where the men note that while they have known and grown up eating the fruit, the younger generation have not eaten the *Enhalus* fruit as there are no more fruit since 1990's.

Table 11: Response of participants (male and female) to age at which they first knew of dugong and seagrass

COUNTRY	SITE NAME	AGE WHEN THEY FIRST HEARD***** OF			
		DUGONG		SEAGRASS	
		Men	Women	Men	Women
Malaysia	Palau Sibü	7-10	10	Young age	-
	<p>*Women: Young participants claimed they knew of dugong only in the last two years. Older generation as early at 10 years old.</p> <p>* Men: All men claimed that the seagrass fruit they ate were plenty in 70's. But after 1990's they found no more fruit. (current younger generation have not eaten this).</p>				
	Palau Tinggi	Young age	7-8	20's	-
	<p>* Women: most participants knew about the dugong in the last few years. Response in the table is of 1 participant.</p> <p>* Men: all knew this animal as <i>Duyung</i> since young.</p>				
Solomon Islands	Naro village	Young age	Young age	2	Young age
	<p>*Men: First know of dugong since young age and stories of dugong from parents and older people. When we started to go out to the sea we actually saw the dugongs ourselves. Some saw it when it was dead and brought to land, others know it through old stories. We know of seagrass since "running naked around"- about 2 years old. During low tide it is visible from shore.</p> <p>*Women: Growing up they heard stories about dugongs from their elders. As we grown up we see seagrass.</p>				
Madagascar	Ambolobozokely	15	Young age	Young age	-
	<p>*Men: We heard from our parents. When we started to go fishing.</p> <p>*Women: "We know this by our parents."</p>				
	Ananalava	-	-	-	-
	* Men and women recognize images and have heard of the dugong. Two men have seen it a long time ago.				
	Ankazomborona	12-13-15	3 years ago	-	-
	*The answers recorded of both men and women is for marine algae, not seagrass. Hence omitted.				
	Ironona	10	X	2 years ago	X
	Lalandaka	10, 16	X	Young age	X
	Ampombofofo	Teens	X	-	X
	* For others it was just a story they heard from their parents.				
	Ampasindava	10-15-18	X	Since we started fishing	X
	Dugong Festival interviews	2 years ago, 14	X	-	X
Mozambique	Ibo- Quirimbas	Heard from elders	X	-	X
	Angoche	Heard from elders	X	-	X
	Vilankulos	Heard from elders	X	-	X
Timor Leste	Tutuala	Heard from elders	X	Heard from elders	X
	Lore-1	Heard from elders	X	Heard from elders	X
Sri Lanka	Chavankachcheri	-	X	-	X
	Vidaltivu	-	X	-	X
	Talaimannar	-	X	-	X
	Pooneryn	-	X	-	X
	Moondampiddy	-	X	-	X
	Karainagar	-	X	-	X

3.4.2. Age at which children engage in fishing activities

There is a recognition amongst most communities in the benefit of formal education. This, in many sites (see Table 12), is seen in the later age at which children become engaged in fishing compared to

***** The answers to this question are either participant averages or the only numerical response that was recorded during the survey. It is only indicative and not absolute information, and is specific only to the respondents who participated in during the survey.

previous years. Formal education is also an indication of the option of alternative livelihoods to subsistence occupations. The choice in occupational options are particularly noted in Malaysia and Sri Lanka where the participants explicitly mention it.

This data marks a first record for the current sites within the DSCP that should be monitored over time to understand upcoming trends, particularly in context of the strength or dilution of familiarity with their natural environment, and the transmission of traditional, practical and cultural knowledge gathered from occupations and interactions with the species.

Table 12: Responses of participants (male and female) on age at which children become engaged in fishing activities

COUNTRY	SITE NAME	AGE AT WHICH CHILDREN START FISHING	
		Men	Women
Malaysia	Sibu	Before 7-10, now 18	Before 9-10, now 17+
	<p>*Men: Before it used to be age 7-10 for boys. Girls rarely went out fishing. Nowadays they start fishing after high school, at the age of 18. They may fish for fun earlier but it is only for catching squid.</p> <p>* Women: Nowadays children go to sea after their SPM exams, around 17 years old. In the old days, in the 80's, it was 9-10 years old.</p>		
	Tinggi	12	15-16
	<p>* Men: "Before they start fishing at the age 12 onwards. Nowadays they go fishing if they like it."</p> <p>* Women: "Depends whether children like to try out fishing. Usually during primary school they go fishing with their dad. If interested they become fishers at age 15-16. Girls rarely go out fishing."</p>		
Solomon Islands	Naro	7	4-5 (girls), 12(boys)
	<p>*Men: Age from 7 up, already they hold spears along the coast.</p> <p>*Women: At 4-5 years girls already start bamboo fishing. Boys engage in hunting usually at 12 years old.</p>		
Madagascar	Ambolobozokely	15	10-12
	Ananalava	10 (girls or boys), 12, 16	12
	<p>*Men: The average age a girl or boy begins to fish is 10 years old (16 and 12 mentioned by different focus group interviews held in the same site. No detail about whether this was for both boys and girls).</p>		
	Ankazomborona ⁺⁺⁺⁺	10-12-16	14
	Ironona	12	X
	Lalandaka	15-16	X
	Ampombofofo	10-15	X
	Ampasindava	12	X
	Dugong Festival interviews	10	X
Mozambique	Ibo- Quirimbas	7-10	X
	Angoche	10-12	X
	Vilankulos	7 or younger	X
Timor Leste	Tutuala	-	X
	Lore-1	-	X
Sri Lanka	Chavankachcheri	-	X
	Vidaltivu	-	X
	Talaimannar	-	X
	Pooneryn	-	X
	Moondampiddy	-	X
	Karainagar	-	X

++++ Individual interviews from Ankazomborona and Ampasindava are not included as the survey questions did not cover this question.

3.4.3. Traditional fishing/hunting techniques and perceptions on future of fishing

The information provided by participants on hunting techniques of their ancestors, are diverse. Hunting is spoken of almost always as practices of ancestors. In some sites the detail is remarkable and in others quite basic or non-existent. The lack of detail is likely a result of increasing distance from first-hand knowledge, loss of context, indifference and in some cases it could also be the result of communities deliberately distancing themselves from a cultural norm because of policies that penalize this behavior.

There is a range of perceptions that have been noted in the participants response to the future of fishing and hunting occupations. The focus is largely on the future of fishing (there is indication that fishers might have resorted to dugong hunting either for food or for income, which could likely be because of inadequacy of fisheries efforts).

Table 13: Overall inferences on responses to traditional fishing/ hunting techniques and future of fishing/ hunting occupations

Inferences of fishing/hunting techniques	Inferences of future of fishing/hunting occupations
<ul style="list-style-type: none"> • There is no definite indication from any site that these practices still exist in their communities, or in pockets elsewhere, as they are spoken of in the past tense. • In sites where there are detailed accounts of ancestral hunting techniques, it is remarkable to note the information that is gathered on not just the biology, behavior and habitat of the dugong but also all associated species (knowledge on seagrass varieties for example and in some cases other fish that are seen around dugongs) including information on physical parameters such as season, tide, geography, etc. • There are also cultures where dugongs are traditionally not hunted as in Naro village, particularly the Kidipale tribe (that identifies as the bloodline of the dugong) in Solomon Islands. As this is only one site in Solomon Islands that was culturally surveyed, it is not representative of the entire country. Naro village participants indicate themselves that there are other neighboring tribes that hunt dugongs for its meat. • There are mechanisms for the protection of dugong in all cultural survey countries that are enforced through bans, prohibitions and stiff penalties on hunting. But it is likely that this does not preclude the existence of the practice altogether. • Traditional fishing practices accounted by the participants across the countries are distinctive in that there is no mechanization of fishing and the effort was much more pronounced in relation to the catch. These are accounts of subsistence fishing and in majority of the cases it was the occupation of the men of the community. • In fishing techniques where special nets were used (likely in efforts for nominal income from sale of fish), dugong have been accidentally caught. • There are women who are equally aware of the practices around the hunting of dugongs by ancestors as well as in the subsistence fishing effort. The men in Palau Tinggi in Malaysia indicate that women nowadays go out to sea to help fish with their husbands. 	<ul style="list-style-type: none"> • There is a range of perceptions on this matter. • In sites where other opportunities exist and there is access to higher education (without an economic impediment) and mobility, there are remarks made about later entry into fishing or about parents voluntarily opting an alternative livelihood for their children. • There are similar decisions also made where there is an apparent and adversely impacting resource competition and /or scarcity that marginalizes subsistence occupations. It also is driving people in some communities to supplement their income sources or change occupations altogether. • The men in Tinggi speak of technology in fishing as the future with the impression of infinite resources. This indicates the exposure of these communities to possibilities and options to answer their likely declining returns in fishing effort. • In other sites the children follow on the footsteps of their parents. • With likely easier access to education (or likely mandatory education policy), some sites show an adaptation to continue the tradition of children fishing with their parents on holidays and weekends or helping with fish landing or other land-based activities before and after school. • In almost all sites, these fishing activities are expected to be taken up or passed on to the boys of the family.

3.4.4. Summary of perceptions on loss of seagrass and dugong

The summary of responses shown in Table 14 note a distinct difference in value characteristics between the dugong and seagrass in the lives of the community. There is also a marked gender difference in the responses.

The loss of dugong appears to present a diverse set of responses among men that represent indifference, ecological importance, heritage value, economic value and as food. Among women, the responses largely appears to present as loss of heritage. The value of seagrass is undeniable in its habitat for fish that determines the status of fisheries for these communities. There are a few who respond with indifference but the overwhelming majority respond to its ecological importance, economic advantage and its value as food. Among women, the perceptions are similar to men, but also include a heritage value.

Table 14:: Summary of responses on “What do you think will happen if dugong and seagrass disappeared?”

Dugong	Seagrass
<p>MEN:</p> <ul style="list-style-type: none"> • Lose economic value from tourism • Don't know • Don't know what the benefit is so don't know what the disadvantage would be • Don't know the relationship • Other animals related to it would disappear • Seagrass will overgrow • Will not change anything • Our descendants will not know of it • Unfortunate as it is an advantage compared to countries who don't have it • All rituals, stories and practices associated with it will disappear • A part of our culture will eventually disappear • They are already gone • Marine fauna richness would be lost • Coast would be threatened • A source of our food, of protein, will be lost <p>WOMEN:</p> <ul style="list-style-type: none"> • Don't know • Difficult for dugong to become extinct- the sea is a big place and they might move elsewhere. • Our stories from grandmothers will not be ok because our children will not see the animal from the story. • Our children will not know of it • Will not change anything • New generation will not have any knowledge of the species • There can be consequences to ecological equilibrium. Like the food chain for example, even if we don't understand all the details. 	<p>MEN:</p> <ul style="list-style-type: none"> • Fishes will migrate elsewhere • Fishes will lose habitat, so decrease in fish • Fishes will lose food so our catch will reduce • Marine fauna and coast will not be protected • Fish will starve • Seagrass is already disappearing • Will not be able to catch shrimp anymore • Place to fish prawns and fish close to shore will be lost • We will lose an area to fish <p>WOMEN:</p> <ul style="list-style-type: none"> • Fishes will disappear too • Fishes will not have to eat • Our children will not be able to see what seagrass is • Fishes will die, turtles too • Fish will have no place to play • Will not really matter • Dugong will lose its food • There can be consequences to ecological equilibrium. Like the food chain for example, even if we don't understand all the details.

3.4.5. Summary of meaning of loss of seagrass and dugong for future generations

Almost all the responses to the meaning of the loss of dugong for their children are around its value as a heritage that includes all the stories, rituals and uses around it. There is a sense of a developing indifference as many of the younger participants don't see the value of the dugong anymore as they don't see dugongs in their environment, unlike some of the older generation of both men and women. Some of the despondent remarks of the older generation already appear to be the case in many sites.

Again, overwhelmingly the response to meaning of seagrass loss to their children is prompted by seagrass value as an income and as a food source. There are a couple of poignant remarks made by a participants about the loss of an entire fishing culture if seagrass were lost.

Table 15: Summary of responses for "What would your children lose if dugong and seagrass were lost?"

Dugong	Seagrass
<p>MEN:</p> <ul style="list-style-type: none"> • Lose a sense of heritage • Not be able to see the dugong anymore • Only read of it in books • We don't know • They are always here • Dugong already is endangered • Will lose our custom stories (no dugong as related proof of woman changing into dugong) • Already our children don't see it • Knowledge of these species will be lost • Will lose our culture in relation to the dugong • Will not be able to see the beauties of the sea <p>WOMEN:</p> <ul style="list-style-type: none"> • Lose knowledge concerning these species. Seems common but it is serious. • Will remain just stories for our children • Will not know what kind of animal it is • Then stories from our grandparents will not be ok, because then our children will not be able to see the animal • Don't know because we don't see them • They will only know the animal through photos, not alive • Nothing to lose 	<p>MEN:</p> <ul style="list-style-type: none"> • Huge loss to fishing industry • Coastlines will be eroded • Not be able to find fish or squid • Don't know • They are always here • Will lose a habitat • Will find it hard to fish, find money, etc. • They will not have fish to eat • Lose an entire culture whether son or daughter of fishers • Extinction of fish and food resources • No place to earn income from <p>WOMEN:</p> <ul style="list-style-type: none"> • Lose knowledge concerning these species. Seems common but it is serious. • There would be no work or job for them • Will not be able to see what seagrass is • There will be no fish • Will only know it though photos not alive. • Nothing to lose

4. Inferences of the Cultural Scoping Study

The DSCP cultural scoping study provides a unique opportunity to demonstrate the value of cultural characteristics in conservation, across a diverse geography.

The process of developing the cultural scoping study itself offered as valuable insights as the data received from the study sites. The inferences from the cultural scoping survey data are presented first. This is followed by inferences on the design and execution of the survey.

4.1 What did we learn from the cultural scoping survey?

Traditional (or indigenous) knowledge, beliefs and practices are born of and evolve based on the local community's proximity and degree of dependence on nature. Many of the surveyed sites **indicate an intergenerational relationship of the community to the species**. This presents an insight into the behavior of the communities in relation to the species. This also is a window into information on the species. The relationship is, however, influenced heavily by any change in context.

Information from survey participants show that:

- Despite differences in geography and unique cultural characteristics of the survey communities, there is a **distinct similarity in the relationship of the community to the species** in the 22 surveyed sites, across the 6 countries.
 - A vast majority of the local community participants, both men and women, recognize that the **seagrass beds are important for fisheries**, whether for their own consumption or for income.
 - The relationship with the **dugong** on the other hand is more complex. The species appears to **hold an intrinsic value** to the local communities, both tangible and intangible. Many of the surveyed communities regard the dugong as either a representation of humans (being born from humans or having human characteristics, both physical and emotional) or having a range of sympathetic relationships to or for humans.
- **Language**, whether in names of the species, their descriptions, or oral transmission of stories, parables, songs, etc., **plays a significant role in the perception and behavior** of the community members around these species. It is a **first point of entry on cultural characteristics** of a community. For example, in all the sites, the local name for the dugong is a visual perception of the species –sea pig, reef pig, fish pig, sea cattle, lady of the sea, mermaid etc.- ascribing certain characteristics to its identification, eliciting a certain behavior and attitude, and giving a context to the stories, songs, parables, rites and rituals that are developed around it. In certain sites, for example, the human form of the dugong, particularly the female of the species, is a reason for its name- mermaid (Palau Sibu and Palau Tinggi, Johor, Malaysia) or lady of the sea (Naro village, Solomon Islands). This physical characterizations extends into some of the content of the source stories as noticed in the Malaysia and Solomon Islands survey sites. In terms of affecting behavior, where the dugong is called “sea-pig” in the local language, the Muslim members of the community would not touch or consume the animal. Or in Madagascar for example, the species of seagrass known to be eaten by the dugong - *Ahitrozona*, carries the name for dugong (*Trozona*, is a common term used to identify large marine megafauna/ cetacean, in this case the dugong) and is carried in the names of physical sites – *Antambohotrozona* - where these species are encountered.
- In the past the traditional beliefs and practices appear to have **defined the roles, responsibilities and occupational profiles of communities around dugong in particular**. Some examples include - **persons officiating specific rituals** that accompanied a dugong hunt or capture, particularly seen in sites in Madagascar with the *Anjoaty* tribe specialized in the ritual dugong slaughter. No other community member, not even the hunter was allowed this role; the **healers and seers** who use charm in Malaysia, or helped overcome taboos and curses from

dugong capture seen in certain sites in Madagascar and Mozambique; **traditional medicine practitioners** who used dugong parts (seen in almost all of the surveyed sites) and certain varieties of seagrass (Solomon Islands); and, the **artisans**, for example, in Malaysia and Sri Lanka who used dugong parts to create specialized objects (ornaments, trinkets, walking stick, etc.).

- Some of the traditional (indigenous) beliefs and practices likely **inform community codes of conduct such as deterrence or promotion of certain perceptions and behaviors around the dugong and seagrass**. For example, the fear of the dugong capsizing their canoes/boats deters night fishing and hunting activities, or from using certain channels during high tide. Or the curse of capturing a dugong resulting in personal, economic or social losses. In the case of seagrass, because of an inherent understanding of its value to fisheries, there is no deliberate destruction of the seagrass beds. Participants in Naro village (Solomon Islands) note that the seagrass beds are shown respect and considered sacred describing them as fish gardens or taboo areas for replenishment of sea resources. Their need to safeguard these sites seems to enhance their perception of threats to healthy seagrass beds (motorboat blades injuring seagrass or erosion and run-off from land-use practices).
- In majority of the survey sites **custom or source stories** are an **important identifying feature** of the species relationship to specific tribes or whole communities. All the custom or source stories recounted are around dugongs, while the seagrass are supporting features of the story. This is particularly seen in Madagascar, Solomon Islands, and Malaysia. There is tremendous value in a custom or source story, whether it is to understand what prompted its birth, its parameters, or what it aims to attain. Every detail of the story is likely to hold depth of information on the subject of the story, the surrounding environment and the reason for a particular behavior or response it hopes to incite, elicit or command in the members of a community. Given the participant responses, it is likely that there is (or was) a custom or source story in Mozambique given taboos and curses that are mentioned. In the case of Sri Lanka and Timor-Leste, however, there is not enough data from participants in sites to substantiate any ritual based relationship to dugong and seagrass.
- The **custom or source stories show attachment, relationships, uniqueness, priorities, and behaviors towards the dugong and seagrass in an informal way**. Custom stories are passed on easily to children and are recounted with fervor through generations, reinforced through present-day experiences. For example, just the visual presence of dugongs, to specialized encounters with dugongs (like the stories brought back by fishers on how dugongs showed them where the fish were) validated the custom or source story and commonly held perceptions of dugongs. In the case of seagrass, in particular the fruit bearing seagrass, its presence was acknowledged by children and women not just for the fruit it bore, but as seen in Malaysia, is an important element in the transfer of the custom or source story. As long as the seagrass fruit is collected and consumed, the custom or source story would bear relevance to share.
- **Gender and age** depict important considerations in the **transfer** of overall traditional knowledge. Occupationally active fishers, and retired fishers of the community transfer **experiential knowledge**: knowledge of the biology of the species, where it could be found, what value it holds, traditional hunting and fishing activities, etc. Children, from a young age help their parents to sort out the day's catch and prepare for or aide fishing/ hunting activities in almost all the survey sites. Early engagement of children (including those who go to school) to fishing activities, exposes them to their own encounters and experiences with seagrass and dugong. Women and elders, meanwhile, play a significant part in **cultural education** of the younger generation. Women and elders sing songs, narrate stories to children and introduce them to lifestyles in context to their surroundings. For example, the seagrass fruit is collected by women and children in Malaysia and women cook the fruit into daily dishes. In the Solomon Islands site, the children collect the fruit and barbeque it. Women and children, from a very young age, in Malaysia and Solomon Islands catch fishes and crustaceans in seagrass beds in shallow waters. This is likely the case in the other sites too.

- **Differences in the perception of the species and knowledge of the species, were noticed based on the occupation of the participants.** The knowledge of the fishers on dugong and seagrass was more detailed and their sensitivity to the species was more evident given their occupation, compared to farmers or traders, for example, in the same community or similar communities not far from each other. This difference was noticed in two sites in Madagascar, Ampombofofo where majority of the participants were farmers, and in Ambolobozokely where majority of the participants were fishers. Differences in the significance of the species was also noticed between occupations. In Angoche in Mozambique, there is mention of dugong bones being used to increase wealth and production in a farm. In Ankazomborona, Madagascar, there is mention of seagrass use as fertilizer. These remarks indicate the penetration of the significance of the species across occupations. It also indicates the likely demand for the species from other occupations.
- There is indication that **knowledge that is recently acquired that does not have cultural depth, could likely show weak retention over time.** This, as the use of language, tools and mechanisms of introduction are culturally unfamiliar or irrelevant. There has been outside intervention in all of these communities (whether for projects on environment or development, of local or international enterprise) that influence their original way of life and perceptions. In many of the responses of the participants across many sites there were distinctly noticeable aided responses. The responses were all “correct”, whether it was the “threat of climate change that destroyed seagrass” or that the “dugongs and seagrass play a vital role in ecosystem”. Some of these aided responses however do not indicate a personalization of the information and likely will fail to incite the same behaviors that a custom story or a song or a ritual might incite.
- The cultural recognition of the species and relationship characteristics of the species to humans appears to be a **source of traditional ecological knowledge (TEK).** This was picked up through the varieties of seagrass that participants from different sites were familiar with in their local language, and in particular, where participants are able to specifically identify the species of seagrass the dugong prefers and where it can be found or remarks of the participants on special value of certain species of seagrass or even the one site in Madagascar where seagrass is used as fertilizer in farming. This was also noticed in the detail of the biology, behavior and habits of dugong remarked by participants gathered through their fishing and hunting experiences.
- The survey highlighted that **custom or source stories are narrated, recalled and transferred as long as the enabling environmental contexts exist.** Over time these stories are modified, distorted, diluted or sometimes forgotten. This is a result, often, of changing environments and the loss of pivotal characters or situations. There are a growing list of influences to traditional and cultural beliefs and practices that range from the loss of species, to technology, religion/ religious institutions, rapid socio-economic development, global market influences, alternative livelihood options, etc. What often tends to remain of the story over generations, if at all, is either the fantastical/ supernatural elements; or the core belief; or sometimes the irrelevant (that could be constructive or destructive) narratives.
- **Sensitivities** due to nature of cultural knowledge/ practices and **apprehensions to sharing information** because of regulatory and/or legal enforcements of behaviors around dugong and seagrass were noticeable but not always clearly understood or identifiable through the survey. In the Solomon Islands for example, while the story of the Kidipale tribe was shared by the participants, on further probing, the moderator was informed that the “*Custom story belongs to the tribe. It is taboo to tell the story to outsiders. It is the story of the tribe. To get the full story, get it from Roe.*” In Madagascar, several of the focus group participants from different sites mention different aspects of rituals and rites preceding and succeeding the capture of a dugong. However, the oral history narrated by a 103 year old Elder that bears similar, but more definitive, details of the rituals and rites, has requested for it to not be shared publicly (outside this study). As the survey was particular to avoid inhibition of participants in sharing cultural knowledge, many of the questions, particularly those

pertaining to hunting, were phrased in the past tense. While this served the purpose of gathering information, it does not preclude the fact that hunting still exists in some of these communities where for a variety of reasons, often for food or as substitute income.

- All the participants expressed genuine concern on the **uncertainty of** the future in maintaining their **subsistence livelihoods**, as they have known it for generations, if one or both of the species were lost. The participants are acutely aware of the fast pace of socio-economic and technological change that are influencing the nature of their current lifestyles and occupations. Their concerns are around not just the deterioration of their fisheries efforts but also loss of their primary source of food and nutrition.
- The common sentiment across all the participants was for their **children to** have a better future and to **know the dugong and seagrass** as their parents and grandparents have known them- **as part of their coastal life, their occupational heritage, and as part of their unique cultural knowledge**. The participants shared their concern about the losses their children would face to not know or benefit from dugong and seagrass if these species left their seas and coasts, or disappeared.

4.1 What inferences did we pick up from the design of the study?

There have been important inferences with regard to the survey design (approach and execution) and analysis highlighted in this section.

4.1.1 Survey development and execution

The secondary data sources (Figure 3) were a good reference for the survey to incorporate the dynamics of age-based hierarchy, gender-based differences in roles, educational and occupational profiles, as well as the profile, capacity and skills of the executing teams in the participating countries. Key inferences brought out through the survey design and execution are presented below.

- a. In some communities, having young and old participants in the same focus group, meant that the young did not get to speak up much, and the older participants had the maximum share of voice. This is true for **hierarchical societies** (majority, if not all, of the countries in the study), where the **young show deference and respect for the elders**. This suggests that the points-of-view of the young participants were likely not heard, elaborated and/ or understood impartially.
- b. The nature and societal make-up of the communities determined the **representation of women** in the survey. It **fell short** in several countries, lead to limited understanding of the diverse, roles, responsibilities, points of view and perspectives on the species from this section of the community.
- c. There is **potential to understand the influence and dynamics of** dugong and seagrass in **other occupations** identified in the community, than just through fisheries. These include subsistence farmers, religious heads, specialized traditional practitioners (witch doctors, seer, priests, slaughterers, etc.), including relatively recent livelihood opportunities among the community as rangers in marine parks, tourism sector workers, boat owners, divers, etc.
- d. The **perspectives of children** below the age of 14 on the species was a consideration in the survey design that was not executed due to time constraints. But the current survey did provide a substantial basis for consideration of this age category to be surveyed given that children in all the 22 sites across the 6 countries engage fishing related activities fairly early on, even if they attend school regularly, are exposed to stories on the species, as well as recreationally use the marine environment. Their perceptions and take-aways would **add to the understanding of intergenerational knowledge transfer**.
- e. As **responses** of participants were **not recorded and translated verbatim** or **by respondent profile**, it left the data open to inherent selection bias and the field researcher's interpretation of the responses before the analysis was done.

- f. **Oral histories** were designed to be conducted **as one-on-one interviews**. While the original design intended to cover the accounts of specialized persons in the community (therefore offering the opportunity to cover perception of community members with distinct and different occupations, including village chiefs, religious heads, historians, community cultural experts, story tellers, artists and artisans, etc.), the final design, for efficiency of time, requested field offices to **record perceptions of an Elder (oldest member) in the surveyed community**.
- g. The **post survey questionnaires filled by the field staff as well as country study-leads** were a **mechanism to capture as much context of the site and country as possible to inform** the work of the cultural scoping study analysts particularly in the **site data synthesis and developing the country inferences** of the study. The post-survey questionnaires also provided valuable country-specific insights to the drafting of recommendations, allowing a collaborative development to the outcomes for the cultural scoping study report.

4.1.2 Analysis, synthesis and corroboration

The inferences from the process of analysis and synthesis of qualitative and quantitative information from the surveyed sites, and their triangulation, where possible, highlighted the following:

- a. As the analysts were not part of the field teams that conducted the, group discussions or oral history interviews, **non-verbal cues**, such as body language, participant interaction, reactions & emotions to the questions or other participants' responses, **could not be picked up and incorporated in the final understanding**.
- b. In some sites and countries, it was a challenge understanding whether the **differences** were driven **due to known variables** (such as gender or occupation or age) or **due to unknown variables** that were beyond our understanding. The unknown variables emerged through the analysis of survey data characteristics and added significant dimensions to the output of the synthesis. For example, in Solomon Islands, the differences between the responses of men & women seemed to be driven largely because they were from different tribes and not (only) because of their gender.
- c. The **corroboration of information** received from the sites to **responses in CMS Dugong MoU Questionnaire surveys** from the same or nearest geographical reference site was a significant exercise. It helped validate consistency of the descriptive information, substantiating inferences made at the country level, as well as contributing to diversity in detail. For the cultural scoping study this provided rigor in the quality of the information received and strength of the inferences made. The triangulation helped provide insights mutually beneficial to both the CMS Dugong MoU questionnaire survey as well as the cultural scoping survey (see Recommendations).
- d. Triangulation of information from **post survey questionnaires** (field staff and country offices), where available, was **insightful in contextualizing the survey data** through providing the reason for the selection of sites, highlighting contemporary issues and historical influences in the sites.
- e. There was limited time available within this scoping study for a thorough literature search to identify **participants information as valuable TEK sources**. But a few were identified as an indicative effort to show the potential of the exercise as an important consideration in a cultural valuation study in the future, or any site specific conservation effort. TEK research can constructively inform conservation science, efforts and activity.

4.2 Implications for dugong and seagrass conservation effectiveness

Primarily, the DSCP's cultural scoping study reiterates what is already known in the conservation community - that knowledge on cultural characteristics and sensitivities, alongside collaborative exchange of information with knowledgeable community members and their active participation, could help plan, design and execute effective and efficient conservation programs and policies. Such

an approach would undoubtedly facilitate a sustained retention and transfer of knowledge favorable to conservation of the dugong and its seagrass habitat.

The results of the cultural scoping study have highlighted that the surveyed communities are not likely to pose the single biggest direct anthropogenic threat to dugong and seagrass.

In particular, the cultural scoping study in the six participating countries has helped highlight entry points of conservation engagement and mechanisms of conservation action.

Further, the framework and insights of the cultural scoping study are equally applicable to any conservation study with an intention to profile the influence of the anthropogenic dimension. It is not bound by geography or number of countries, and, as demonstrated by the DSCP cultural scoping study, can be planned and delivered in a relatively short time frame. The added insight from the framework is that it is possible to discern a format through such a scoping study that allows an “economy of scale” of conservation interventions.

5. Recommendations

The following recommendations have been developed following detailed conversations with the country project leads for the cultural scoping study and their post survey questionnaire responses. Extensive conversations were also held with the DSCP coordinator to align and frame the recommendations to the context of the broader Dugong and Seagrass Conservation Project profile.

5.1 Insights from the cultural scoping study for conservation effectiveness

This section was developed by asking the question “ knowing what we know now from the cultural scoping study, what parameters would the approach and nature of intervention include that would further the effectiveness of dugong and seagrass conservation?”

A meta-analysis conducted by Andrade & Rhodes (2012), specific to Protected Areas Management, demonstrates that, in general, the inclusion of local communities is likely to be a key determinant of willingness to comply with conservation strategies. A key mechanism of inclusion is identifying and incorporating community characteristics into the strategy. Presented below are the characteristics of the community gathered through the scoping study that serve to enhance the success of conservation efforts.

5.1.1 Species based specific conservation entry-points

- A. Seagrass has universal value for fisheries which offers a strong and structured **economic imperative** for its protection. This imperative is universally understood, by not just the subsistence fishers and local community but also the larger fishing industry.

Knowing that fisheries are a principal source of food and significant in the economy of the community/ country/ region, all actors (infrastructure developers, farmers, tourism and other relevant industries) impacting seagrass need to be considered important participating partners in the protection of this economy and the food resource.

- B. Following from bullet A., it is important to work closely with the community on issues of **income stability** (including environmental and economic viability) through livelihoods that are favorable to the protection of dugong and seagrass.
- C. Within the local community where dugong have significant influence, there is an opportunity to introduce conservation as a **cultural imperative** for its protection. This would help **maintain/build the identity of the community** and its environs in relation to the species. It would also be a compelling basis for the hospitality and tourism sector to build culture, language and heritage the species bring into the uniqueness of their offering.
- D. Presenting and promoting the dugong and seagrass not just as Keystone Species, but as **Culturally Defined Keystone Species (CKS)****** would help elevate their value and, therefore, their implicit protection.
- E. **Emotional imperative** demonstrated by all the participants when speaking about their children or the future generation, not being able to know, see or benefit from the species, presents a strong driver of conservation in the community.

5.1.2 Nuanced conservation messages

Developing educational and outreach material that represents the community's beliefs, knowledge, experiences and characteristics would help better define the interaction and effectively drive the conservation message in both the community, as well as the industry associated with or built around the resources that the community depends on. This is suggested through:

**** Keystone species are those that are crucial to the structure and function of an ecosystem. Cristancho & Vining, 2004, proposed an extension of this concept coined by Paine, 1969, to highlight those species that deserve to be considered most important to the structure and function of a community, both culturally and historically.

- A. Working closely with community Elders in drafting and disseminating conservation messages
- B. Use of local language use and expression in messaging
- C. Culturally sensitive messaging
- D. Age and gender profiled messaging
- E. Occupational relevance of messaging

Helping **maintain and revive custom or source stories** and ancestral practices and beliefs that are vital to the identity of a community or tribe could play a **positive role in the conservation** of the species

A further note to point is that existing community participation in conservation must encourage maintaining tribal/ traditional identity through language and context. This would ensure sustained and easily transferable information on the species.

5.1.3 Identifying the target audiences

The target audiences identified are those picked up from the survey responses that are capable of driving change, both positive and negative.

- A. **Within a community:** women, children, men, different subsistence occupations, specialized occupations
- B. **Industry and interest groups around the community:** fisheries, agriculture (including plantations), tourism and hospitality, real estate construction, infrastructure development (transport, waste management, etc.), utilities (water, energy, waste management, etc.)
- C. **Institutions:** Education, religion, culture and heritage, social development and special community groups, cooperatives and committees

5.1.4 Facilitating and promoting multiple platforms for engagement

Conservation intervention through identifying and creating multiples avenues in a community to disseminate nuanced messages would allow a better penetration, retention as well as transfer over time. Specific examples of such avenues, drawn from the survey information, have been presented here.

- A. Specially designed and developed species festivals, like the Dugong Festival in Madagascar that allows exchange of information on the species amongst the different local communities as well as between the conservationists and local communities.
- B. Introduce the species as unique and of heritage value through story telling using books, films, theatre with emphasis on local cultural stories, beliefs and practices for both adults and children.
- C. Rare Pride campaign model that uses the theory of change concept in social marketing programs to stimulate human behavior change to promote conservation (Jenks, et al., 2010).
- D. Contributions to local educational curriculum to incorporate both experiential knowledge and scientific knowledge of the species in learning.
- E. Use existing or specially designed occupational training and development events for fishers and other member of the community that rely on marine resources.
- F. Work with the local community to highlight the species during their own cultural events and practices
- G. Work with local religious heads to spread the value and conservation of the species through religious sermons and practices.
- H. Develop opportunities to involve local industry to participate in these platforms.

5.1.5 Traditional Ecological Knowledge (TEK)

Several sites of the cultural scoping study survey demonstrated a significant insight into and depth of knowledge on the species that were culturally and experientially acquired.

Indigenous or traditional knowledge (IK or TK) exhibit characteristics of being local, are orally transmitted, originate from practical experience, emphasize empirical rather than theoretical, are repetitive, changeable, are widely shared, show fragmentary distribution, present orientation to practical performance and holism (Ellen et al. (eds.) 2000).

Decision IV/9 of the Conference of the Parties (COP) to the convention on biological diversity (CBD) notes that “traditional knowledge should be given the same respect as any other form of knowledge ...,” including scientific knowledge (UNEP, 1998).

In light of this, cataloguing TEK should be an important component of the conceptual project design and an exercise that all conservation projects should undertake when working with indigenous peoples and local communities that live alongside these species. As the same time, it is crucial, as stated in a letter by the International Alliance of the Indigenous Peoples of the Tropical Rainforest to the CBD secretariat (1996), that no access to TEK (IK or TK), innovation or practices should take place, without prior and informed consent of the peoples concerned.

5.1.6 Governance in conservation

Conservation messages and actions are as effective as their uptake. While most of the bullets above are a bottom-up approach to conservation intervention, governance presents the top-down approach. The survey indicated that in many communities’ motivations for conservation often are still embedded in culture-based customary institutions, and most are equally influenced by broader political and socioeconomic contexts. This is useful from a policy perspective because they inform the governance of conservation (Ruiz-Mallén et al., 2015).

The survey has indicated that there are multiple community-wide references and affiliations that define community perceptions and behavior towards the species. Those identified are listed below, and should be actively considered and engaged with (or used) in defining and designing conservation governance.

- A. Traditional practices, codes and customary laws (such as Dina in Madagascar or *Suco* Regulation in Timor-Leste).
- B. Traditional tribal land and sea tenure and kinship systems, and their perceptual and operational execution (Aswani et al., 2017)
- C. Religion and role of religious heads and institutions in deterring or promoting behaviors (particularly evident from survey information in Solomon Islands, Malaysia and Sri Lanka).

5.2 Insights and improvements on overall survey and study process

- A. More than one survey site should be selected for a country, with as much geographic distance between them as possible, in relation to species presence.
- B. As particularly noticed in the case of this cultural scoping study, some sites required additional time to understand and conduct protocol requirements to be able to access tribes and tribal permissions to conduct the cultural scoping surveys. This needs to be a factored into all cultural studies as part of anticipation of expected delays.
- C. Surveys should consider the socio-economic and demographic profile of the communities to design the survey segmentation by age, gender and occupation.
- D. Future surveys should conduct separate Focus Group Discussions by defined younger and older age categories, along with separate Focus Group Discussions by gender. Women should interview women and men should interview men to allow easier ambience of exchange.

- E. Participants of different occupations should be surveyed in separate occupation-based focus groups. Separate focus group for fishers, separate focus group for farmers, etc.
- F. Multiple Focus Group Discussions should be conducted in sites, proportional to the population of the community.
- G. Children below the age of 14 should be interviewed to understand the uptake of formal, experiential and informal learnings and to gauge the degree of intergenerational knowledge transfer. This would be particularly useful when done regularly over time.
- H. Specialized community occupational categories (witch doctors, healers, seer, priests, chieftains, etc.) as well as local experts such as historians, archeologists, ethnographers, etc. should also be interviewed.
- I. Where possible and allowed, audio and video recording should be made during the focus group discussions as well as interviews for better capture of non-verbal cues and to be able to attribute remarks by participant.
- J. The survey format should be repeated in regular time intervals to allow an understanding of trends over time.
- K. Awareness on extent of existing intervention in the communities is important to ensure that there is no “survey exhaustion” amongst the community members.
- L. Forms such as the Free, Prior Informed Consent should be used in all cultural surveys to reassure the participants of the local community of the safekeeping of the information they share that is sensitive to their cultural background.
- M. It is important to design and conduct the cultural scoping study as a dedicated multidisciplinary team, with skilled social scientists in the field working in close cooperation with local experts.
- N. Analysis and synthesis of data should ideally be done working closely with identified country or community experts.
- O. Improved participation and clear entries in the CMS Dugong MoU questionnaire surveys would tremendously help in supporting cultural studies. Equally, through the insights from the cultural scoping surveys there can be
 - better incorporation and updating of the questions and language used in the questionnaires
 - greater specified representation of questions on seagrass habitats
 - improved selection of survey sites based on cultural mapping

These points would feed added value back into the subsequent cultural studies.

5.3 What do we do with this information and where do we go from here?

5.3.1 Cultural scoping study inclusion in conservation interventions

A rapid cultural assessment at the planning stages of the conservation intervention would allow better framing of the conservation opportunities and challenges with targeted activities and messaging. As this study has demonstrated, it is possible to conduct this exercise within a short time frame, at a scale that can cover multiple countries with multiple sites efficiently and affords measurability when done

at the start. A cultural scoping study at the project initiation stage would weave sensitivities in approach to the design of the project. It has the ability to change the language of the milestones and goalposts of the project and bring a greater ambience for learnings that are more likely to be sustainable and carried across generations. Further, a thoughtful design of projects/ programs would limit repetitive and conflicting approaches to conservation interventions in a community.

5.3.2 Initiate multidisciplinary cultural valuation study

The cultural scoping study has provided an insightful information base to design and develop a multidisciplinary cultural valuation study.

5.3.3 Global TEK catalogue on dugong and seagrass

Insights from TEK have been shown to inform several different fields and endeavors, including science, medicine, agriculture, rural development, environmental protection, political empowerment, cultural identity, and defense of human rights (Zent & Maffi, 2008). The proposed global TEK catalogue on dugong and seagrass would be a species-specific concentrated and manageable effort in identifying, cataloguing and indicating the value of TEK.

5.3.4 Opportunities for specialized and applied research

The cultural scoping study raised several fascinating questions and topics that present as potential areas of research. A few have been presented here as a bulleted list to provide an idea of the diversity of topics, their multidisciplinary nature, as well as the value it could bring to conservation of the dugong and seagrass.

- A. Why are certain practices regarding the dugong similar across geographies? Understanding through patterns of colonization, trade exchanges, mammalian characteristics of species and characteristics of human nature.
- B. Language-nature links across dugong and seagrass distribution range: study of similarities and differences.
- C. Etymology studies of names of species (Blench, 2008).
- D. Degree of influence of culture on presence, density and distribution of dugong and seagrass. E.g. Within the same geography Bazaruto has a greater viable population of dugong, why?
- E. Spatial mapping of presence of indigenous cultures vs marine biodiversity/ species density.
- F. Mapping culture (abundance and distribution) versus species (abundance and distribution)
- G. Mapping and cataloguing TEK
- H. Study of traditional versus contemporary knowledge (change over time) and traditional versus scientific knowledge.
- I. Anthropological research on deriving conservation imperatives from source and custom stories of indigenous peoples and local community
- J. Ethnobiology research on the *Anjoaty* tribe of Madagascar and their species knowledge
- K. Is there a relationship between HDI and intergenerational transfer of knowledge?
- L. Gender based cultural learning influences on early childhood education

M. Livelihood viability appraisals: chart livelihood changes and influence on species and habitat status

N. Are threats to culture same as threats to species health?

5.3.5 Publication opportunities: culture, socio-economic drivers, conservation status

There is a wide variety of sources of information on dugong and seagrass. It would be tremendously valuable to bring together the multidisciplinary expertise within the DSCP network to

- jointly publish scientific articles academic books and coffee table editions.
- develop educational school and story books in local languages for children of all ages incorporating culture as well as the science around the species.
- Propose a biennial flagship publication that tracks time trends in relation to all aspects of the species, introduces new studies and updates existing research and studies (such as CMS Dugong MoU questionnaire participation and results of the volumes of data) to present a comprehensive status of the species.

The publication opportunities would raise the profile of the species not just among the academia and dugong range countries, but also the wider global community that benefits from the presence of these species.

References

- Abdelhameed, R.F., Ibrahim, A.K., Yamada, K. et al. Med Chem Res (2018) 27: 1238. <https://doi.org/10.1007/s00044-018-2143-7>
- Adulyanukosol, K., Hines, E., and Boonyanate, P. 2010. Cultural significance of dugong to Thai villagers: Implications for conservation. Proceedings of the 5th International Symposium on SEASTAR2000 and Asian Bio-logging Science (The 9th SEASTAR2000 workshop)
- Affendi, Y.A., Ooi, J., Phang, S.M., Azhar, H., Faedzul, R.R., & Rosmadi, F. 2005. Dugongs in Peril: The conservation and protection of dugongs in Johor, Malaysia. Report of the Joint Project by TITAN Chemicals Corp Bhd, United Nations Development Programme and Universiti Malaya Maritime Research Centre. November 2005.
- Anaya, J. 1996. Indigenous peoples in international law. Oxford University Press, New York, New York, USA.
- Andrade, G. S. M., Rhodes, J. R. 2012. Protected areas and local communities: an inevitable partnership toward successful conservation strategies? Ecology and Society 17(4): 14. <http://dx.doi.org/10.5751/ES-05216-170414>
- Aswani, S., and P. Weiant. 2004. Scientific evaluation in women's participatory management: monitoring marine invertebrate refugia in the Solomon Islands. Human Organization 63(3):301–319.
- Aswani, S., Albert, S., Love, M. 2017. One Size does not fit all: Critical insights for effective community based resource management in Melanesia. Marine Policy 81 (2017) 381-391. <http://dx.doi.org/10.1016/j.marpol.2017.03.041>
- Blench, R. 2008. The Austronesians in Madagascar and their interaction with the Bantu of the East African coast: Surveying the linguistic evidence for domestic and translocated animals. Studies in Philippine Languages and Cultures. Volume 18. Pp 18-43. Kay Williamson Educational Foundation.
- Brush, B.S. 2005. Farmers' rights and protection of traditional agricultural knowledge. CAPRI Working Paper No 36. CGIAR Systemwide Program on Collective Action and Property Rights. International Food Policy Research Institute. Washington D.C. January 2005.
- Bunce, L., Townsley, P., Pomeroy, R., Polnhac, R. 2000. Socioeconomic manual for coral reef management. Global Coral Reef Monitoring Network (GCRMN). Australian Institute of Marine Science
- Centers for Disease Control and Prevention. Practical Strategies for Culturally Competent Evaluation. Atlanta, GA: US Dept of Health and Human Services; 2014.
- Christancho, S., Vining, J. 2004. Culturally defined keystone species. Human Ecology Review (Society for Human Ecology). Vol 11, No. 2, 2004.
- Cox, P. A. 1997. Indigenous peoples and conservation. Pages 207–220 in F. Grifo and J. Rosenthal, editors. Biodiversity and human health. Island Press, Covelo, California, USA.
- Das, H. 2000. *Ongés* and their vanishing mermaids. Hornbill, Bombay Natural History Society. January-March 2000. Pp4-8.
- De longh, H.H., H. Malikusworo, M. Moraal and W. Kiswara. 2009. National Conservation Strategy and Action Plan for the Dugong in Indonesia Part I. Scientific Report, Institute of Environmental Sciences Leiden and Research Centre for Oceanography Jakarta.
- Dugong Seagrass Conservation Project. <https://www.dugongconservation.org>
- Ellen, R., Parkes, P., and Bicker, A. (eds.). 2000. Indigenous Environmental Knowledge and its Transformations. Amsterdam, the Netherlands: Harwood Academic Publishers
- Garnett, S.T., Burgess, N.D., Fa, J.E., Fernández-Llamazares, A., Molnár, Z., Robinson C.J., Watson, J.E.M., Zander, K.K., Austin, B., Brondizio, E.S., Collier, N.F., Duncan, T., Ellis, E., Geyle, H., Jackson, M.V., Jonas, H., Malmer, O., McGowan, B., Sivongxay, A., and Leiper, I. 2018. A spatial overview of the global importance of indigenous lands for conservation. Nature Sustainability. Vol 1 July 2018. pp 369-374. Springer Journals. www.nature.com/natsustain
- Hines, E., Adulyanukosol, K., Duffus, D., Dearden, P. 2005. Community Perspectives and Conservation Needs for Dugongs (*Dugong dugon*) Along the Andaman Coast of Thailand. Environmental Management. 36. 654-64. 10.1007/s00267-003-0287-8.

- Hines, E., Parr, L., Tan, U.M.T., Kwan, D. & Novak, A. 2008. Interviews about dugongs and community conservation issues in the Myeik Archipelago of Myanmar. *Sirennews: Newsletter of the IUCN/SSC Sirenia Specialist Group*. 49.
- Iacob, M., Alexandru, F., Kagitchi, M., Cretan, G.C., & Iorgulescu, F. 2012. Cultural heritage evaluation: a reappraisal of some critical concepts involved. *Theoretical and Applied Economics*. Volume XIX (2012), No 12(577), pp.61-72
- ICOMOS. 1999. International Cultural Tourism Charter- Managing tourism at places of heritage significance. (Adopted by ICOMOS at XII General Assembly, Mexico October 1999).
- International Alliance of the Indigenous Peoples of the Tropical Rainforest. 1996. The Biodiversity Convention – The concerns of indigenous peoples. Submission of the International Alliance to the CBD Secretariat. May 1996
- Jenks, B., Vaughan, P.W. & Bitlet, P.J. 2010. The evolution of Rare Pride: Using evaluation to drive adaptive management in a biodiversity conservation organization. *Evaluation and Program Planning* 33 (2010) 186-190. Elsevier.
- Kwan, D., Marsh, H. & Delean, S. 2006. Factors influencing the sustainability of customary dugong hunting by a remote indigenous community. *Environmental Conservation*. 33 (2): 164–171.
- Marsh, H., Penrose, H., Eros, C., & Hughes, J. 2002. Dugong status reports and action plans for countries and territories. UNEP early warning and assessment report series. UNEP/DEWA/RS.02-1
- Marsh, H. & Sobtzick, S. 2015. Dugong *dugon*. The IUCN Red List of Threatened Species 2015:e.T6909A43792211. <http://dx.doi.org/10.2305/IUCN.UK.20154.RLTS.T6909A43792211.en>. Downloaded on 09 November 2017.
- Maffi, L. 1998. Language: a resource for nature. *Nature and Resources* 34: (4)12–21.
- Maffi, L. [Editor]. 2001. On Biological Diversity: Linking language, knowledge and the environment. Smithsonian Institution Press 2001.
- Maffi, L., & Woodley, E. 2010. Biocultural Diversity Conservation: A global sourcebook. Earthscan, from Routledge.
- Ruiz-Mallén, I., Schunko, C., Corbera, E., Rös, M. and Reyes-García, V. 2015. Meanings, drivers, and motivations for community based conservation in Latin America. *Ecology and Society* 20(3):33. <http://dx.doi.org/10.5751/ES-07733-200333>
- Margoulis, R., Stem, C., Salafsky, N., Brown, M. 2008. Using conceptual models as a planning and evaluation tool in conservation. *Evaluation and Programme Planning*. Elsevier. Doi.10.1016/j.evalprogplan.2008.09.007
- Markus, T., Hillebrand, H., Hornidge, A-K., Krause, G., Schlüter, A., Krause, A-K. 2017. Disciplinary diversity in marine sciences: The urgent case for an integration of research. *ICES Journal of Marine Science*. 75. 10.1093/icesjms/fsx201.
- Mauro, F., Hardison, P.D. 1999. Traditional Knowledge of Indigenous and Local Communities: International Debate and Policy Initiatives. *Ecological Applications*: Vol. 10, No. 5, pp. 1263–1269.
- Moore, A. 2017. “The Lost Princess (*putri duyung*)” of the Small Islands: Dugongs around Sulawesi in the Anthropocene. *Frontiers in Marine Science*. 4. . 10.3389/fmars.2017.00284.
- Nabhan, G. P. 1997. *Cultures of habitat: on nature, culture, and story*. Counterpoint, Washington, D.C., USA.
- Nanayakkara, R. 2015. Some Notes on the Dugong in Sri Lanka. *Loris*. 27. 30 - 32.
- Paine, R.T. 1969. A note on trophic complexity and community stability. *The American Naturalist* 103, 91-93.
- Partal, A., and Dunphy, K. 2016. Cultural impact assessment: a systematic literature review of current methods and practice around the world. *Impact Assessment and Project Appraisal*. International Association for Impact Assessment (IAIA) 2016. <http://dx.doi.org/10.1080/14615517.2015.1077600>
- Penrose, H., Eros, C., Hugues, J. 2002. Dugong Status Report and Action Plans for Countries and Territories (Compiled by Marsh, H.). UNEP/DEWA/RS.02-1

- Pilcher NJ, Adulyanukosol K, Das H, Davis P, Hines E, Kwan D., et al. 2017 A low-cost solution for documenting distribution and abundance of endangered marine fauna and impacts from fisheries. *PLoS ONE* 12(12): e0190021. <https://doi.org/10.1371/journal.pone.0190021>
- Pilcher, N.J & Kwan, D. 2012. Dugong Questionnaire Survey Project Manual. CMS-UNEP Abu Dhabi Office. United Arab Emirates. September 2012. 44 pp.
- Pilcher, N.J., Williams, J., Hopkins, G., Hess, D., Jaouen, L., 2014. CMS-UNEP Questionnaire Survey: Assessment of Dugong Distribution and Interactions With Small-Scale Fisheries, CMS-UNEP Office Abu Dhabi, United Arab Emirates, p. 86
- Pilcher, N.J., Williams, J., Hopkins, G., Hess, D., & Jaouen, L. 2017. *CMS Dugong MOU Standardised Dugong Catch and Bycatch Questionnaire Final Report*. CMS Office - Abu Dhabi, United Arab Emirates.
- Rajamani, L., Cabanban, A., & Abdul Rahman, R. 2006. Indigenous Use and Trade of Dugong (*Dugong dugon*) in Sabah, Malaysia. *Ambio*. 35. 266-8. 10.1579/05-S-093.1.
- Rajamani, L., & Marsh, H. 2010. Using parallel regional-and local-scale initiatives to inform conservation management of rare wildlife: A case study of the dugong *Dugong dugon* in Sabah, Malaysia. *Endangered Species Research*. 13. 17-23. 10.3354/esr00310.
- Rajamani, L. & Marsh, H. 2015. Mapping seagrass cost-effectively in the Coral Triangle: Sabah, Malaysia as a case study. *Pacific Conservation Biology*. 21. 10.1071/PC14908.
- Ruiz-Mallén, I., Schunko, C., Corbera, E. , Rös, M. , Reyes-García, V. 2015. Meanings, drivers, and motivations for community based conservation in Latin America. *Ecology and Society* 20(3):33. <http://dx.doi.org/10.5751/ES-07733-200333>
- Stork, N. E. 1999. The magnitude of global biodiversity and its decline. Pages 3–32 in J. Cracraft, and F. T. Grifo, editors. *The living planet in crisis: biodiversity science and policy*. Columbia University Press, New York, New York, USA.
- Teh, L., Teh, L., Hines, E., Junchompoo, C., and Lewison, L. R. 2015. Contextualising the coupled socio-ecological conditions of marine megafauna bycatch. *Ocean & Coastal Management*. 116. 449-465. 10.1016/j.ocecoaman.2015.08.019.
- Therivel, R., & Wood G [Editors]. 2018. *Methods of Environmental and Social Impact Assessment*. 4th Edition. The Natural and Built Environment Series. Routledge 2018.
- UNEP. 1992. Convention on Biological Diversity. VNEP No. 92-8314. United Nations Environment Programme, Nairobi, Kenya.
- UNEP. 1998. Report of the fourth meeting of the conference of the parties to the convention on biological diversity. UNEP/CBD/COP/4/27. United Nations Environment Programme, Nairobi, Kenya.
- Unsworth, R., McKenzie, L., Collier, C., Cullen-Unsworth, L., Duarte, C., Eklöf, J., Jarvis, J., Jones, B., Nordlund, L. 2018. Global challenges for seagrass conservation. *Ambio*. 10.1007/s13280-018-1115-y.
- Wedding, L.M., Lepczyk, C.A., Pittman, S.J., Friedlander, A.M., Jorgensen, S. 2011. Quantifying seascape structure: extending terrestrial spatial pattern metrics to the marine realm. *Marine Ecology Progress Series (Contribution to the Theme section|'Seascape ecology')*. Vol 427:219-232, 2011. Doi:10.3354/meps09119
- World Heritage Commission. <http://whc.unesco.org>
- Zent, S. and Maffi, L. 2008. Final Report on Indicator No. 2: Methodology for developing a Vitality Index of Traditional Environmental Knowledge (VITEK) for the project "Global indicators of the status and trends of linguistic diversity and traditional knowledge". Terralingua.
- Zogib, L. [Editor}. 2013. A rapid assessment of cultural conservation practices in the Mediterranean. Mediterranean Consortium for Nature and Culture, October 2013.

Appendices

Appendix 1 Compilation of cultural information from DSCP project documents

Appendix 2 Themes and guiding questions

Appendix 3 Survey pack

Appendix 4 Brief note on qualitative analysis

Appendix 5 Site by country schematics (qualitative data synthesis)

Appendix 6 Synthesis of post-survey questionnaires

Appendix 7 Detailed qualitative data tables

Appendix 8 Compilation of detailed traditional stories, songs and practices (available only on special request)