



Holding the line: Assembling and mapping local and traditional knowledge of historic injustice and environmental change held by handline fishers in the Cape Agulhas region

By:
Brian Palmer

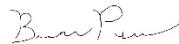
Supervised by:
Dr. Philile Mbatha

The Department of Environmental and Geographical Science
Masters of Climate Change and Sustainable Development



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Acknowledgements

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Abstract

Small-scale fishers in the Cape Agulhas region of South Africa hold valuable local and traditional knowledge that is insufficiently incorporated in fishery governance. Several meta-level global directives including the Convention for Biodiversity (CBD), United Nations Educational, Scientific and Cultural Organization (UNESCO), and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) call for the incorporation of local knowledge into environmental governance for the sake of achieving more equitable and ecologically sound outcomes. At the national level, the Small-Scale Fisheries Policy (SSFP) calls for stakeholder engagement and the inclusion of local perspectives in management. Additionally, the national Marine Spatial Planning Act (MSPA) addresses the challenges of managing complex social ecological systems by calling for the amalgamation of diverse environmental and human resource usage data through GIS mapping. To date, however, there remains insufficient policy and scholarship dedicated toward outlining methodology for how local and traditional knowledge should be meaningfully and equitably infused into evolving environmental governance toolkits.

This research seeks to investigate the ways small-scale fishing knowledge has been historically excluded from fishery governance so as to identify ways of empowering historically marginalized knowledge holders. Supported by meta-level directives and national policy, this research employs a dual case study in the communities of Struisbaai and Buffeljagsbaai of the Cape Agulhas region. The research is aimed at documenting local and traditional knowledge of small-scale fishers using focus groups, key informant interviews, and mapping surveys. Results of the study demonstrate a wealth of local knowledge held by small-scale fishing communities that remains underutilized in fishery governance. The study results illustrate the need for more widespread ethnographic research and the refinement of methodology so that cultural data can achieve parity with ecological and economic knowledge.

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List of Abbreviations

| | |
|------|--|
| ANC | African National Congress |
| BB | Buffeljagsbaai |
| BLME | Benguela Large Marine Ecosystem |
| CBD | Convention for Biodiversity |
| EBSA | Ecologically or Biologically Significant Marine Area |
| EBUS | Eastern Boundary Upwelling System |
| FAO | Food and Agriculture Organization |
| FG | Focus Group |

| | |
|------------|--|
| FPDC | Fisheries Policy Development Committee |
| GIS | Geographic Information System |
| IK | Indigenous Knowledge |
| IPBES | Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services |
| IPCC | Intergovernmental Panel on Climate Change |
| IYAFA | International Year of Artisanal Fisheries and Aquaculture |
| KI | Key Informant |
| LK | Local Knowledge |
| LP | Labor Party |
| LTK | Local and Traditional Knowledge |
| MLRA | Marine Living Resources Act |
| MPAs | Marine Protected Areas |
| MS | Mapping Survey |
| MSP | Marine Spatial Planning |
| MSPA | Marine Spatial Planning Act |
| NP | National Party |
| SB | Struisbaai |
| SFA | Sea Fisheries Act |
| SoGH | Seas of Good Hope |
| SSF sector | Small-scall fisheries sector |
| SSFs | Small-scale fishers |
| SSFP | Small-Scale Fisheries Policy |
| TEK | Traditional ecological knowledge |
| UN | United Nations |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| WHS | World Heritage Site |

Chapter 1: Introduction

1.1 Introduction

The small-scale fisheries sector (hereafter referred to as the SSF sector) supports approximately 90% of all people employed in the world's capture fisheries (FAO, 2015). The sector is explicitly small in scale in terms of its usage of traditional methods, minimal use of technology, and modest profits. However, it plays an outsized role in food security and poverty alleviation in many parts of the world that are otherwise lacking in human development opportunities (FAO, 2015). The SSF sector is increasingly being acknowledged for supporting a greater degree of environmental sustainability and social equity than large-scale fishing (Sowman and Sunde, 2021). Signaling an uptick in global recognition of the SSF sector, the United Nations (UN) declared 2022 the International Year of Artisanal Fisheries and Aquaculture (IYAF22) (FAO, 2022). The IYAF22 is led by the Food and Agriculture Organization (FAO) of the UN and seeks to enhance public awareness globally about the complexity of sustainable development opportunities and challenges within the SSF sector while working to improve governance for those in the sector (FAO, 2022).

The IYAF22 Global Action Plan calls for transdisciplinary management, reflecting the growing understanding that small-scale fisheries are a subsystem of what Ostrom (2009) calls complex social-ecological systems (FAO, 2022; Sowman and Sunde 2022). Governance systems and subsystems of such complexity require deep understanding of individual parts and how they interact to form the whole (Ostrom, 2009). Local and traditional knowledge of small-scale fishers (hereafter SSFs) is a component of the complex social-ecological system that is often incompletely understood in marine resource governance (Basurto et al., 2013; Ostrom, 2009; Partelow et al., 2018). Similarly, Jentoft and Chuenpagdee (2009) argue that fishery governance is a “wicked problem”, of great complexity, that must identify and incorporate local knowledge alongside the scientific understandings which typically carry more weight in management decision making. The recognition of the value of local knowledge in fishery governance signals a move away from prescriptive, one-size-fits-all solutions, in favour of a nuanced approach.

The diversity of South Africa's SSF sector is reflected in the 110 distinct fishing communities dotting its 3,000 km coastline and inland freshwater ecosystems (Sowman et al., 2014; NBA, 2018). Understandings of the scale of the SSF sector in South Africa are limited by poor data, with best estimates on its size being drawn from old reports from 2002, which project the sector to directly employ approximately

30,000 individuals (Ortega-Cisneros et al., 2021; Sowman et al, 2014; Clark et al., 2002). Approximately 85% of small-scale fishers are linefishers also known as handliners, who use single hooks and no rods or reels to pull in catches (DAFF, 2016). Despite scholarship recognizing the need for governance to be tailored to unique social-ecological contexts, this limited demographic data on the SSF sector helps demonstrate a failure to adequately account for the distinctiveness of individual small-scale fisheries (Sowman and Sunde, 2022). The ongoing neglect of the SSF sector in South Africa is further exemplified in how the rights of *bona fide* fishers were undermined by the Marine Living Resources Act (MLRA) of 1998 (Sowman and Sunde 2021). While the rights of SSFs have since been reinforced under the SSF Policy of 2012, the failure to adequately implement the policy and actualize its many objectives, including the consideration of local stakeholder input, warrants an investigation of governance shortcomings (Sowman and Sunde, 2021).

South African fishery governance has been widely criticized for its failure to inclusively engage stakeholders (Sowman and Sunde, 2021). This study embraces a broad definition of governance that includes more than just government processes, and instead incorporates all the ways in which individual, institutional, public, and private stakeholders interact to manage affairs (Bene & Neiland, 2006). Marine resource governance is often deemed to be particularly difficult given the many stakeholders involved, the need for scientific expertise, and large size of jurisdictions (Carbonetti et al. 2013; Jentoft et al. 2010). Marine resource governance in the global South, often has the added challenge of conflicting subsistence and economic growth imperatives (Carbonetti et al. 2013). It is increasingly being understood that governance processes that maximize the breadth and depth of stakeholder engagement are more likely to avoid “wicked problems” associated with marine resource governance (Jentoft et al. 2010). This study acknowledges there are many common themes that can be identified in SSF management yet argues for the importance of understanding context and variability.

Recognizing the importance of the SSF sector for sustainable development globally and in South Africa, this study seeks to assess the role local and traditional knowledge plays in marine resource governance through a dual case study approach. Two SSF communities in the Cape Agulhas region of the Western Cape are presented as examples of the value of a stakeholder engagement process that elevates marginalized knowledge to provide site-specific context for improved governance. The identification of local and traditional knowledge is both an avenue for highlighting complexities within social-ecological systems, and a way of elucidating how the exclusion of diverse knowledge types undermines governance as a whole. While this study seeks to uncover findings and methods that are useful to the

SSF sector in general, it will also demonstrate the need for similar knowledge co-production studies across all South African fishing communities so as to infuse unique, context-specific knowledge into all fishery governance. This Introductory chapter contains aims, objectives, rationale, a description of study sites, and an outline of the dissertation structure.

1.2 Aim

The aim of this study is to use Struisbaai and Buffeljagsbaai case studies as a lens to identify and assemble local and traditional knowledge about small-scale fisheries through participatory mapping and oral histories, with the intent of enhancing understanding about what is needed for small-scale fisheries resilience in the Cape Agulhas region in the context of environmental change and historic injustices.

1.3 Objectives

- To collate local and traditional knowledge of handline fishers in Struisbaai and Buffeljagsbaai.
- To understand the impact of historic injustices in shaping current realities in the Cape Agulhas region small-scale fishery.
- To highlight the significance of mapping local and traditional knowledge in small-scale fisheries governance in the Cape Agulhas region.
- To chronicle local knowledge about fisheries ecosystems and climate change held by small-scale fishers in Struisbaai and Buffeljagsbaai.

1.4 Rationale for the study

A primary reason for conducting this research is to contribute to the need for local, context-appropriate data to feed into the fisheries governance process in the Cape Agulhas region. This need is upheld by scholarship on the SSF sector and complex social-ecological systems studies which call for a greater breadth and depth of stakeholder engagement (Biggs et al., 2022; Basurto et al., 2013). Additional rationale supporting the assemblage of local knowledge for fishery management is enshrined in the South African policy and legal framework including the 2012 Policy for the Small-Scale Fisheries Sector (popularly known as the Small-Scale Fisheries Policy (SSFP) (DAFF, 2012) and 2018 Marine Spatial Planning Act (MSPA) (Republic of South Africa, 2018). Still, there remains a gulf between policy and praxis (SA MSP ACT, 2018; SSFP, 2012; Sowman and Sunde 2021). The reason a case study research approach has been undertaken is to assess local perspectives on fishery governance and engage

stakeholders in how policy implementation might be improved to actualize desirable social and ecological outcomes in the Cape Agulhas region.

The rationale of this study is supported by both national directives aimed at improving fishery governance, as well as meta-level mandates elevating local and traditional knowledge. The FAO Voluntary Guidelines for Securing Sustainable Small-scale Fisheries in the Context of Food Security and Poverty Eradication (FAO, 2015) calls for the SSF sector to be leveraged to improve well-being. However, small-scale fisheries management in South Africa has failed to deliver desirable livelihood outcomes, with small-scale fishers experiencing widespread poverty and inadequate recognition of rights (Isaacs and Witbooi, 2019; Sowman et al., 2014). Additionally, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), the independent body established to guide the sustainable use of resources, has committed to enhanced recognition of indigenous and local knowledge systems (Tengo et al., 2017). Despite intergovernmental directives on incorporating traditional knowledge systems into management, there remains a failure to adequately identify and mobilize local perspectives (Tengo et al., 2017). The mismatch between higher-level policy objectives and community-level outcomes is a major motivation for embarking on this study of local knowledge in the Cape Agulhas region SSF sector.

The possibility that the management of the Cape Agulhas SSF sector is likely to be subject to increased scrutiny further warrants investigation into local perspectives there. This is partially due to the fact that the Cape Agulhas region lies within the proposed Seas of Good Hope (SoGH) Ecologically or Biologically Significant Marine Area (EBSA) (SoGH, 2020; Harris et al., 2022).¹ While EBSAs don't make specific management mandates, it is expected that their definition will drive the evaluation of management approaches (Dunstan et al., 2016). This expectation is being met in South Africa where EBSAs are leading to new MPAs and other MSP strategies (Sink et al., 2019). The EBSA process prioritizes ecological and biological significance both in name and practice, while making less consideration of social, cultural, and economic factors (Johnson et al., 2018). The bias of the EBSA process for scientific knowledge is reflective of a failure of environmental governance practitioners to adequately consider marginalized knowledge types (Johnson et al., 2018; Tengo et al., 2017). This study seeks to contribute to the Seas of Good Hope EBSA application process which, so far, fails to adequately include local and traditional knowledge (Kirkman et al., 2021). By adding to the body of work on local and traditional knowledge in

¹ The EBSA process was established by the Convention for Biological Diversity and is a way of identifying marine areas of ecological and biological significance and providing support for their protection.

the area, this study is driven to help infuse marginalized knowledge types into the management interventions that proceed from EBSA designation.

Additional rationale for this study is drawn from the knowledge that the marine ecosystems of the Western and Eastern Cape have been identified by conservation organizations as areas for a potential UNESCO World Heritage Site (Forests of the Sea, 2022). As UNESCO designation represents one of the highest orders of international conservation, this would be a significant development for the people who rely on marine resources in the area, including those in the communities of study (Molarch and Verschuuren, 2019). Like EBSAs, the UNESCO process is not prescriptive in its management recommendations but would more than likely lead to shifts in marine resource governance (Caust and Vecco, 2017). There is only one other marine UNESCO site in South Africa to date, the iSimangaliso WHS on the coast of KwaZulu-Natal. While the management strategy for the area proclaims the goal of balancing conservation, economic and social objectives, the plurality of local and high-level international governance institutions in the area and the associated power imbalances are seen to have undermined traditional livelihoods in the area including the use of traditional fish traps (Mbatha, 2018; Mbatha, 2022). By investigating the state of local and traditional knowledge held by fishers in the Cape Agulhas region and contextualizing it within international governance frameworks, this study seeks to provide input into how UNESCO designation may impact local livelihoods.

Through this approach, the ultimate motivation is to contribute to the process of building resilience in the area of study. The rationale is strengthened by the increased threat of climate change in the region as well as the uncertainty about exactly how changes will manifest in the marine environment (Ward et al., 2021). The degraded state of marine ecosystems increases the need for improving the adaptive capacity of small-scale fishers in the region (Blamey et al., 2015). Vulnerability in the communities of study is compounded by low rates of socio-economic development resulting from historic and ongoing injustices. The compounded need for adaptation to climate change and other risks makes for an earnest research rationale.

1.5 Case study site

The Cape Agulhas region in the Western Cape province of South Africa is located on the southwestern coast of the country where the Atlantic and Indian Oceans meet. This is also where the cold water Benguela Current and warm water Agulhas Current converge. The areas of Struisbaai Noord and Buffeljagsbaai have been identified as the two areas of study. Struisbaai Noord is located on the east

side of Cape Agulhas and is adjacent to the community of Struisbaai, a largely affluent vacation and retirement community. Many of the people living in Struisbaai Noord once lived in the central area of Struisbaai prior to forced removals under apartheid. For this reason, the names Struisbaai and Struisbaai Noord will be used interchangeably throughout this study with clarification added as appropriate. Buffeljagsbaai is a small village located on the west side of Cape Agulhas and is often abbreviated to Buffeljags by its residents. Struisbaai Nord is the primary area of study with Buffeljagsbaai serving as a secondary research site to help bolster and clarify findings from the main site.

Struisbaai is a community within the Cape Agulhas Municipality in the Overberg District of the Western Cape. It has a total population of 3,877 (Cape Agulhas Municipality IDP, 2021). Struisbaai Noord is defined as the Molshoop sub place of Struisbaai and was home to 2,336 in 2011 in an area comprising only 1/3 km² of the town's 270 km² total area.² Struisbaai Noord is largely coloured³ and impoverished whereas Struisbaai is predominantly white and wealthy – though there is limited data available to quantitatively compare the two, as government maps and reports regularly fail to distinguish between them. The vast majority of Struisbaai's small-scale fishers live in Struisbaai Noord, which is 3 km from the fishing harbor itself. Afrikaans is the predominant language spoken in the community, as it is the first language of 80% of residents there (Cape Agulhas Municipality IDP, 2021). It is estimated that 300 people in Struisbaai Noord work as fishers, though that number is likely decreasing (Parker, 2013). Historically, women played an important role in post-harvest fish processing activities, but recent changes have excluded them from the sector (Parker, 2013).

Buffeljagsbaai is a village of approximately 250 people in the southeast of the Overstrand Local Municipality and the Overberg District of the Western Cape.⁴ Buffeljagsbaai is regularly excluded from maps including Google Maps and government maps. The community is almost entirely coloured. Nearly every household is supported by a family that makes a living from marine resources, including small-scale fishing, abalone farming, wild abalone harvesting, and kelp harvesting (Ismail, 2022). Unlike Struisbaai, there is very little tourism infrastructure or industry in the community. Afrikaans is the most

² A South African Census was conducted in 2021 but the results have not been published yet. Municipal population figures reflect 2011 Census data.

³ "Coloured" was a legally defined racial classification under apartheid that included a diverse array of ethnic backgrounds. Generally, it referred to people of mixed ancestry from some combination of African, European, and Asian backgrounds but also included people of indigenous Khoisan descent (Petrus and Isaacs-Martin, 2012). Many people continue to self-identify as coloured despite the ambiguity of the term and the discrimination associated with its historic apartheid roots.

⁴ Buffeljagsbaai population figures are not documented in municipal data or South African Census figures.

commonly spoken language there. Commercial small-scale fishing is almost exclusively done by men in the community. Women continue to play an important role in the post-harvest processing of fish in Buffeljagsbaai, as well as participating in kelp harvesting, and abalone farming (Ismail, 2022).



Map 1.1 Areas of study shown in yellow. 1 Struisbaai Noord is the primary community of interest. 2 Buffeljagsbaai is the supporting community of interest. Note that both communities are regularly excluded from most local and regional maps and had to be added by the author (Wikipedia).

1.6 Dissertation Layout

This dissertation is written for the fulfilment of a Master's of Philosophy in Climate Change and Sustainable Development. It is comprised of six chapters. The first chapter serves an introduction, providing background, rationale, aims, and objectives. Chapter two contains a review of literature relevant to the study, providing conceptual basis for the research. Chapter three outlines methodologies used for data collection and analysis. Chapter four presents research findings relevant to the aims and objectives of the study and literature discussed in chapter two. Chapter five discusses key themes emerging from the findings. Chapter six is the conclusion.

Chapter 2: Literature Review

2.1 Introduction

This literature review acknowledges the importance of transdisciplinary approaches to marine resource governance and will help place this study in the various fields with which it engages. To begin, it will assess the relevant schools of thought surrounding various knowledge types and make an assemblage of available literature on local and traditional knowledge related to the Small-scale Fishery (SSF) sector in the area of study. Next, the value of historical context will be explored, including the identification of knowledge gaps. Existing historical knowledge about fisheries in the Cape Agulhas region will also be assembled. Scholarship on mapping and marine spatial planning related to local and traditional knowledge and marine resource governance will then be assessed. Last, a review of environmental change in the Cape Agulhas region will be made looking at local and scientific knowledge on ecosystems and climate change.

2.2 Local and traditional fisheries knowledge

The value of local, traditional, and indigenous knowledge is increasingly being recognized by global science-policy institutions. Since 1971, with the launch of the Man and Biosphere Program, UNESCO has increasingly been integrating cultural valuation into conservation frameworks (Molarch and Verschuuren, 2019). Molarch and Verschuuren (2019; 11) point to UNESCO as “the first international legal instrument to recognize significant interaction between humans and the environment as cultural landscapes.” The strengthened recognition of local and indigenous knowledge by UNESCO has helped drive the valuation of diverse knowledge types in other UN institutions and global conventions (Molarch and Verschuuren, 2019). The incorporation of different knowledge types is increasingly being recognized as an integral component of environmental management and has been adopted as a guiding principle of the CBD and IPBES (Tengo et al., 2017). For the first time, the most recent Intergovernmental Panel on Climate Change (IPCC) report calls for the engagement of “Indigenous peoples and local communities” for successful climate governance (IPCC, 2022). The FAO’s “Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication” marked a shift toward recognizing and including local knowledge in fishery management and helped inform South Africa’s SSF policy (FAO, 2015; Sowman and Sunde, 2021). The relatively recent addition of diverse knowledge systems in meta-level governance directives makes it so best practices and methodology for knowledge inclusion are still in development (Hill et al., 2020). The literature review that follows

identifies relevant scholarship on local knowledge and contextualizes it in a way that is relevant to the SSF sector of the Cape Agulhas region.

2.2.1 Defining local and traditional knowledge

There are several terms used to describe what this study refers to as local and traditional knowledge. Often, similar studies refer to traditional ecological knowledge (TEK), which is frequently used in regard to indigenous peoples' understanding of their natural environment in settler societies (Nalau et al., 2018). Similarly, indigenous knowledge (IK) explicitly deals with knowledge held by indigenous people. Local knowledge (LK) on the other hand, refers to people who maintain information about their environment and may or may not be indigenous (Nalau et al., 2018). This study seeks to avoid defining what indigeneity is or is not in the context of problematic colonial attempts to determine purity and the author's status as a white man from the global north (Almeida & Kumalo, 2018). Instead, this study adopts an open-ended definition that avoids attempts to classify people in the way they were classified under colonization, apartheid, and often still, in the present. The term local and traditional knowledge (LTK) has been chosen to be inclusive just as this study calls for the equitable inclusion of all knowledge types in marine resource governance.

In a similar way that LTK is used as an inclusive avenue for determining whose knowledge is valued, this study also embraces a broad definition of knowledge itself in order to accommodate as much local perspective as possible. This study explicitly seeks to identify environmental knowledge held by participants, just as TEK, LK and IK scholarship largely focus on information held by people related to the natural world (Nalau et al., 2018). Still, by focusing too much on environmental knowledge, this study would run the risk of excluding other information held by participants in the area of study – an outcome directly contradicting the research objectives. Parsons et al. (2016; 11) argue that knowledge studies should be considerate of a spectrum of thought that includes the “social, cultural, and spiritual, in addition to economic and ecological,” the latter of which are more regularly elevated. Accordingly, this research welcomes all knowledge, including but not limited to, perspectives on governance, historical accounts, and opinions on the social fabric of the community.

2.2.2 Contextualizing ethical considerations of local and traditional knowledge research

In embarking on an LTK study it is critical to recognize additional ethical considerations that come from this type of ethnographic work. Almeida and Kumalo (2018) argue that scholarship is inherently reductive and that academic power dynamics problematically divide indigenous knowledge and bodies

into fragments. In this vein, several scholars identify how studies on local and indigenous peoples' experiences with climate change tend to reduce them to either "passive victims or virtuous heroes", reinforcing colonial rhetoric (Cameron, 2012; Watson & Huntington, 2014). Recognizing the pitfalls of similar studies and the limitations of fully replicating the knowledge of local participants, this research sets out to co-produce knowledge and accurately represent the complex diversity within communities. A decolonial approach to LTK research will further require a recognition of positionality and the way in which power informs the relationships necessary to do this kind of work (Parsons et al., 2016). Lastly, the research draws upon the principle of two-way knowledge sharing, in which research is shared with communities, and where meaningful engagement is not only defined by the collection of data but also the co-analysis of results (Parsons et al., 2016). In this context, the researcher calls upon the University of Cape Town to make as many resources available for the analytical engagement of communities and the return of knowledge to participants, as the school offers to researchers extracting knowledge.

2.2.3 Local and traditional knowledge in small-scale fisheries

Quite often the SSF sector and local and traditional knowledge are closely tied. The UN's International Year of Artisanal Fisheries and Aquaculture (IYAF22) repeatedly recognizes the role of local and traditional knowledge in SSF practice and governance (FAO, 2022). The rise of industrial fishing globally and the proliferation of statutory fishing governance has led to the erosion of the role LTK plays in SSF governance (Mbatha, 2022; Rudolph et al., 2020). Mbatha (2022) looks at the role of customary governance in the SSF sector as an avenue for understanding local and traditional knowledge while cautioning against an oversimplified approach that seeks to connote local authorities as representative of local populations. The inclusion of LTK into SSF governance instead must be consultative and cognizant of the diversity of perspectives and beliefs within various knowledge systems (Mbatha, 2022; Hill et al., 2020).

2.3 The small-scale fishery sector

2.3.1 The global small-scale fishery sector

The declaration of 2022 as the International Year of Artisanal Fisheries and Aquaculture (IYAF22) marks an ongoing change in how the sector is envisioned globally. Worldwide, small-scale fishers make up 90% of people who work in capture fisheries (FAO, 2022). Globally, 492 million people's livelihoods are at least partially supported by the sector, making it a key sector contributing to development and poverty alleviation (FAO, 2022). Historically, the importance of the SSF sector throughout the world has been

undervalued by policy makers and fishery scholars (Sowman; 2006; Jentoft et al., 2018). More recently, there has been an increased recognition of the influence of the sector on marine ecosystem dynamics and social development (Jentoft et al., 2018). Still, governments have been slow to adopt policy protecting the rights and livelihoods of small-scale fishers (Sowman et al., 2021). The lag between the recognition of the importance of the SSF sector and the implementation of policies that safeguard the sector warrants further investigation.

2.3.2 The small-scale fishery in the Cape Agulhas region

There is limited published research specifically dedicated to the small-scale fishery in Struisbaai and Buffeljagsbaai (Parker 2013; Ismail, 2022). The SFF sector in the Cape Agulhas region is largely composed of its traditional linefishery. Despite the lack of research oriented to the geographic parameters of this study, ample context can be inferred through literature dedicated to the linefishery sector as a whole and studies conducted in nearby communities. The linefishery employs handline fishing which involves minimal technology, deploying a baited hook from a boat and pulling in lines by hand without the use of a reel. It is the oldest of South Africa's commercial fisheries still in existence, dating back to the mid-1800s (Blamey et al., 2015; Attwood et al., 2013). In 2000, an observed collapse in several key linefish stocks led to the establishment of an emergency in the linefishery sector by the Department of Forestry, Fisheries, and the Environment (DFFE) resulting in a 70% reduction in total allowable catch (TAC) and the reduction in the number of permits issued (Duggan et al., 2013).⁵ The regulatory landscape, decline of linefish stocks and prioritization of industrial fishing has led to widespread socio-economic strife among small-scale line fishers in the Western Cape (Blamey et al., 2015; Parker 2013; Dennis 2009; Rorich 2020). Both the literature dedicated to the South African linefishery and research specific to the Cape Agulhas region acknowledge the complexity of managing marine resources and corresponding undesirable socio-ecological outcomes.

2.4 The relationship between historical context and current governance processes and practices

Governance scholarship is inherently retrospective in that research regularly looks at the ways various stakeholders have interacted to manage resources (Cleaver & de Koning, 2015). Still, the field of

⁵ The Department of Forestry, Fisheries, and Environment has undergone several instances of restructuring and renaming in the democratic era. DFFE is used throughout the paper for the sake of clarity but may refer to a historical environmental department under a different name.

environmental governance largely fails to specifically recognize the role of history as a component influencing the ways stakeholders interact to manage affairs (Kozanayi, 2018; Mbatha, 2018).

Environmental history is a field in itself, which undoubtedly overlaps with themes of governance. Relatedly, Showers (2012; 215) argues that “a holistic earth-centered environmental history could enhance political ecologists’ investigations of power and its contestation.” Environmental history studies humans’ relationship with the environment over time yet does not typically engage with the processes themselves at the same depth as environmental governance scholarship (Hughes, 2016).

While there is limited literature focused specifically on the role of history in informing environmental governance, several scholars in the field have acknowledged its role in shaping processes and driving outcomes. In his PhD thesis, Kozanayi (2018) identifies the way history has influenced the norms governing baobab in Zimbabwe. The research looks at the impact of colonization on the resource, much in the way other governance scholars do, but goes further in specifically identifying history as a component of the field. Similarly, Mbatha (2022) directly links history to the marginalization of customary coastal livelihoods. The work recognizes the value of providing historical data to governance studies in South African fisheries and embraces a participatory methodology that employs oral history interviews (Mbatha, 2022). This way of thinking aligns with Mosse (2002), a development scholar, who argued that historical framing can help contextualize the importance of culture in human relationships with nature, rather than the dominant way of thinking that views economics as the preeminent force driving resource use.

This research draws on decolonial thought that recognizes the colonial legacies that persist in the present (Díaz Pabón et al., 2021). Though this study embraces a limited focus on history that dates back to living memory, it is important to understand how past events are the result of other events that predated them. Just as the democratic era was shaped by apartheid, colonial injustices are informed by realities of the precolonial era. In South Africa, marine resource use including fishing dates back over 120,000 years (Marean, 2011). From the outset, colonization was marked by control and restriction of fishing practices for the benefit of those in power – a precedent that eventually led to the development of the commercial trawler industry (Thompson, 1913; Visser; 2015). Embracing a decolonial approach, this research recognizes how the colonial systems of domination have yet to be toppled, as liberalized markets and the inequalities imposed during the colonial and subsequent eras prevent full independence (Tilley and Shilliam, 2018; Díaz Pabón et al., 2021). Understanding South African fishing in

this context will allow for a more holistic understanding that views present affairs as the result of a continuum of events.

2.4.1 Small-scale fisheries in the apartheid era

The impact of apartheid remains entrenched in all aspects of South African society – including the SSF sector. The racial classification of people and their subsequent segregation drove the loss of marine access and tenure and the separation of people from their culture, ways of life, and traditions (Sowman, 2011; Sunde and Erwin, 2020). Forced removals under the Group Areas Act drove economic hardship, while victims of the policy received insufficient compensation (Maharaj, 2020). Spatial injustice also came in the form of Marine Protected Areas (MPAs), where coastal conservation mimicked the fences and fines approach to natural resource management on land by creating zones that banned the use of marine resources (Sowman and Sunde, 2018; Lombard et al., 2020).

The hardships imposed upon marine resource users during apartheid have historical roots that predate the era and economic consequences that linger today. It remains difficult to fully quantify the total impact of apartheid, in part, because of the unequal baselines between different racial groups in 1948 when whites already held access to greater opportunity, larger land holdings, and legislation that favoured them (Pellicer and Ranchhod, 2020). Pellicer and Ranchhod (2020) attempt to calculate the attribution of apartheid to inequality by comparing data on livelihood metrics between people in the Western Cape and Northern Cape who were classified as white or coloured before and after 1951 – the year when ancestry, rather than appearance, began being used to determine racial groups. The impact of discriminatory racial policy is profound, with white classification leading to an average of 3.8 additional years of schooling than those determined to be coloured (Pellicer and Ranchhod, 2020). Additionally, being classified as white rather than coloured more than tripled the expected income of males (Pellicer and Ranchhod, 2020). The study does not attempt to place blame for disparity on a single policy or even apartheid alone. Instead, it provides clear evidence of the inequity that was realized from what is called “cumulative discrimination” (Pellicer and Ranchhod, 2020: 21). And while the study falls short of quantifying the economic impact of cumulative discrimination experienced by those classified as black, it provides relevant context to the area of study as the vast majority of small-scale fishers in the Cape Agulhas region are coloured. The legacy of the inequality bred by apartheid and colonization can be seen in the present where only 4.1% of whites are poor compared to 56.8% of the coloured population and 70.75% of black South Africans (Francis and Webster, 2021).

Fishing policy during apartheid underwent several changes that theoretically could have helped build equity in the sector, yet the application of the policy and the cumulative discrimination of the era served to widen the gap between the privileged and the disadvantaged. Looking at the history of small-scale fishing in the Southern Cape, Vissers (2015; 3) points out that the handline fishery was legally open to all during apartheid but indicates, “entry was therefore barred not through an official rights regime but by the increasing cost of purchasing, equipping and operating a suitable boat.” This aligns with the work of Pellicer and Ranchhod (2020) who demonstrated the way cumulative discrimination exponentially benefited whites economically, while coloured people were barred the opportunity to accumulate capital in the same way. Still, Van Sittert, (2002) argues that the National Party (NP) went further than its predecessors in the Labor Party (LP) and successors in the African National Congress (ANC) to implement policies to fragment monopolization of marine resources. The NP did this through policies of handing control of fisheries to Bantustans in 1976 and 1981 and ceding marine law enforcement back to provinces in 1987 (Van Sittert, 2002). Likewise, the first attempt at addressing poverty in coastal communities through quota reform was introduced by the apartheid government with the Sea Fisheries Act (SFA) of 1988 (RSA, 1988). Despite appearing on paper to be designed to help new entrants join the sector, Isaacs (2011) argues the SFA failed to adequately include fishers themselves, while Mafumbu et al. (2022) argue it led to the further privatization of marine resources. Van Sittert (2002) acknowledges the role of racism in driving unequal distribution of marine resources but cautions that focusing solely on that element blinds critics to the role economics plays in inequitable fishing policy. As a result, black-led government in the democratic era has replicated business-friendly fishing policies of the past while flying the flag of liberation.

2.4.2 The small-scale fisheries sector in democratic South Africa

The fishery reform ambitions of the new democratic government initially reflected the society-wide goals of socio-economic transformation after apartheid (Isaacs, 2011; Van Sittert, 2002). The newly formed Fisheries Policy Development Committee (FPDC) was created to explore avenues for improving the economic prospects of coastal communities and restitution through the transformation of the fishing industry (Isaacs, 2011). Efforts to redistribute shares of marine resources drew resistance from monied fishing corporations which saw equitable quota reform as a threat to business (Van Sittert, 2002). Fishing capital allied with fishing labour unions and were bolstered by the increasingly global appeal of free market competitiveness which favoured export-oriented industrialized fishing (Van Sittert; 2002; Isaacs; 2011). Dreams of reform that favoured small-scale fishing and new entrants were

thwarted with the passing of the MLRA which further entrenched the monopolies of fishing corporations and failed to recognize the SSF sector (Isaacs, 2011). In this way, the ANC's⁶ embrace of neoliberalism allowed for the continued inequity caused by colonization and apartheid.

The failings of the MLRA were not passively accepted but met with resistance and continued pushes for reform among the SSF sector and civil society. The NGO Masifundise was instrumental in advocating for small-scale fishers, helping form coalitions and partnerships with international advocacy organizations (Isaacs, 2011). Isaacs (2011) describes the way a fishers' rights movement was built using the social and political pacts rooted in the anti-apartheid movement. This diverse coalition of advocates led to the Equity Court case *Kenneth George and Others versus The Minister*, challenging the fishing rights allocation process (Isaacs, 2011; Sowman, Sowman et al., 2014). This case was pivotal, as it led to the allocation of 1,000 interim relief permits in 2006 and, more importantly, established the grounds for the creation of a new SSF policy in 2007 (Isaacs, 2011; Sowman, and Sunde, 2021). In 2014, after years of consultation between fishers, civil society, and government, a human-rights focused SSF policy was signed into law. Guided by the FAO's Voluntary Guidelines for Securing Small-Scale Fisheries, the new policy was accompanied with high expectations for transformation and restitution in the sector (Isaacs, 2016; Sowman and Sunde, 2021). To date however, little has changed within the SSF sector because of a failure to adequately implement the policy, leading to languishing livelihoods and the continued unequal distribution of marine resource access (Sowman and Sunde, 2021).

⁶ African National Congress, the political party which has been in power throughout the democratic era.



Map 2.1 Small-scale fishing communities of South Africa with communities of study shown in red (Sowman et al., 2014).

2.5 The role of mapping in fishery governance

Maps are widely used tools for environmental governance. For decades, spatially displaying data has been seen as a way of more easily layering complexity into decision making for authorities (Duncan et al., 2006). Geographic Information Systems (GIS) mapping has been celebrated as a democratizing technological innovation (Duncan et al., 2006). On the other hand, critics have used the term “map tyranny” to describe how the technology entrenches power imbalances (Duncan et al., 2006). Map makers must make choices on what data to prioritize when making visual displays, so that all maps contain an inherent bias (Duncan, 2006). This imbalance of maps is further polarized by discrepancies of which data is available to begin with, as there is regularly an abundance of ecological and economic information in comparison to the dearth of cultural and social data (Noble et al., 2019). Recognizing that GIS is a dominant policy making tool, this study seeks to understand the field so as to understand how local and traditional knowledge has been neglected from the mapping sphere.

GIS mapping supports marine spatial planning (MSP) in order to balance multiple human uses within the carrying capacity of an ecosystem. GIS can be helpful in identifying trade-offs and assisting in spatial

prioritization for marine planners (Noble et al., 2019; da Silva et al., 2021). Relatedly, there is an increase in scholarship on the integration of social and ecological data in MSP, including the mapping of various knowledge types (Noble et al., 2019). A literature review on the subject by Noble et al. (2019) found that small-scale fishers are the most targeted group for studies seeking to map and model social data in MSP (Noble et al., 2019). The same Noble et al., (2019) review noted that only two studies of the 1,021 reviewed considered climate change in the MSP process when integrating social and ecological data. Most common among the studies was the assessment of local knowledge, which occurred in 11% of articles (Noble et al., 2019). Despite an increase in attention toward deliberately linking social and ecological data, there remains a need for policy and scholarship that finds ways of rectifying imbalances between the two.

South Africa's 2018 Marine Spatial Planning Act marked a policy shift to more map-based marine resource governance. To date, the MSP Act has yet to have been subject to the level of academic scrutiny that has been directed at other policies discussed in this review such as the MLRA and SSF Policy. The articles that do mention the MSP policy merely make note of its enactment without offering assessment of its substance and ability to achieve the goals stated in the Act (Reed et al., 2020; Ehler, 2021; Finke et al., 2021; Dorrington et al., 2018). The only existing assessment of the MSP Act comes from Lombard et al., (2019) who point to the policy's orientation toward an ecosystem-based approach to management. On the other hand, it is noted that the economic growth priorities of the South African government, embodied in Blue Economy initiatives like Operation Phakisa, create potential conflicts which threaten to undermine the ecological objectives of the MSP Act (Lombard et al., 2019). The potential of the MSP Act to shift marine management makes it so the policy warrants more robust analysis.

It is likely that the newness of the MSP Act explains the limited assessment it has received to date, having only officially been signed into operation in 2021 (Rivers et al., 2022). Still, some insight can be gained from reviewing the text of the Act. The MSP Act suggests a shift toward GIS-driven decision making as it lists "maps and spatial data" as the premier tools for marine planning (SA MSP Act, 2018, page 8). Additionally, the Act calls for planners to "establish a knowledge and information system to house information in order to develop marine area plans" (SA MSP ACT, 2018, page 8). Careful reading of the document indicates a potential replication of historic biases in what type of knowledge is mapped and prioritized. First among information to be incorporated is data on ecological processes followed by social and economic information, as well as existing and future uses, and consultation outcomes. To

date, the rhetorical commitment of the policy to include social information alongside knowledge types that have historically been dominant has not correlated to a strategic commitment to an approach that affords equal treatment of diverse interests. The newly established MSP process has led to the establishment of the National Coastal and Marine Spatial Biodiversity Plan (NCMSPB), which aims to comprehensively map the country's ecological resources (Holness et al., 2022). Parity has yet to be achieved with a similar initiative to compile and map the county's social and cultural data in marine zones.

While proclaiming that the MSP process must be adequately consultative, the MSP Act does not define a standard of adequate consultation and leaves room for the continuation of box ticking exercises rather than meaningful change. Further, the Act fails to address the historical context of marine governance and the ways in which it has propelled the marginalization of various communities in South Africa (SA MSP ACT, 2018; Lombard et al., 2020; Sowman et al., 2014). Relatedly, there is no acknowledgement of historic disparities in knowledge types, that prioritize western science while minimizing local and traditional knowledge (Tengo et al., 2017; Eswani et al., 2018). Without acknowledging this reality and laying out steps for rectifying imbalances between knowledge types, the Act seems poised to fail at its objective of including all users. Instead, the MSP Act, with its reliance on mapping and prioritization of bolstering South Africa's ocean economy, seems poised to entrench inequities of dominant and nondominant knowledge types and the corresponding power imbalances in marine resource management.

2.6 Environmental change in the Cape Agulhas region

The Cape Agulhas marine ecosystems are often assessed as part of the broader Benguela Large Marine Ecosystem (BLME). The BLME is one of the world's four major eastern boundary upwelling systems (EBUS) characterized by cold, nutrient-rich waters supporting high rates of ecological production (Jarre et al., 2015). The global significance of EBUS is demonstrated by the relatively small size of these systems – comprising <1% of global ocean area, compared to their high productivity – accounting for 20% of world fish capture (Garcia-Reyes et al., 2015). Of the four major EBUS, the Benguela has the strongest upwelling which corresponds to high rates of primary production and multi-trophic species richness and abundance (Chavez and Messie, 2009).

A key theme in the literature analyzing upwelling systems is their high rates of variability. The confluence of many variables within EBUS make it so they are dynamic systems not displaying obviously

measurable equilibrium (Garcia-Reyes et al. 2015; Chavez & Messié, 2009). All EBUS, and the winds that drive them, vary seasonally, interannually and on decadal scales (Garcia-Reyes et al. 2015; Bakun et al. 2015). The Benguela system displays the least seasonal variability with year-round upwelling in the northern section and a summer maximum in the southern section where the Cape Agulhas region lies (Chavez & Messie, 2009). The Cape Agulhas region is of particular interest from a variability perspective, given the fluctuation historically observed in the area, where the warm Indian and cold Atlantic Oceans mix. South Africa's South Coast experiences the injection of anticyclone rings of warm, nutrient poor water mixing with cold, nutrient rich water of the Benguela System (Roberson et al. 2017). This unique confluence drives high rates of species richness and endemism and is defined by high rates of variability in the distribution of marine organisms (Roberson et al. 2017).

This section will assess literature chronicling change in the Cape Agulhas region as observed through climate variables as well as through ecosystem change. There is a shortage of data related to change in this area that can be partially overcome through the compilation of multiple types of change and different types of knowledge. Incorporating local knowledge with scientific information will help fill in gaps. Additionally, the triangulation of different knowledge sources may help provide more complete understandings of some of the causality behind observed changes in climate and ecosystems in the Cape Agulhas fishery.

2.6.1 Climate change in the Cape Agulhas region

Like other EBUS, the Benguela System experiences year-to-year fluctuations and more long-term, decadal trends which have historically been measured through variations in sea surface temperature (SST) and dictated by El Niño Southern Oscillation-like patterns known as Benguela Niño (Chavez and Messié, 2009; Bakun et al., 2015). The southernmost extent of the Benguela System, in which the Cape Agulhas region lies, is subject to increased variability due to its interaction with the Agulhas current (Ward et al., 2021). Climate modelers have relatively low confidence in their future predictions for the Benguela System; however, there is general agreement among models which suggest that the physical process of upwelling will intensify under future climate scenarios with more extreme pressure gradients driving stronger alongshore winds and higher rates of advection, in turn, leading to colder water (Bakun et al., 2015; Garcia-Reyes et al., 2015; Ortega-Cisneros et al., 2017). Cooling waters have already been seen to influence marine ecosystems in the area, likely triggering the eastward expansion of kelp forests and rock lobster (Currie, 2017; Bolton et al., 2012; Blamey et al., 2015; Cockcroft et al., 2008). Despite growing agreement about the changes taking place in the area of study, scientific data sets for the

Agulhas Bank have more inconsistencies than the West Coast, leading to more uncertainty about the causality and future trends (Ward et al., 2021).

The limitations of scientific data on climate change in the Agulhas Bank strengthens the need to draw upon different knowledge systems as a way of increasing understanding. There is widespread belief among fishers in nearby communities that winds are intensifying on the Agulhas Bank (Ward et al., 2021). Likewise, discussions with fishers reveal beliefs that the predominant wind direction is changing, and that the sea temperature is becoming more variable (Ward et al., 2021). The alignment of local knowledge with scientific observation should be used to help strengthen confidence in climate predictions. To date, however, there have been few studies oriented toward assembling local knowledge on climate change in the Cape Agulhas region. Ward et al. (2021) help contribute to this largely vacant field and avoid paradigms that place scientific knowledge above other knowledge systems. When discussing the local belief that wind speeds are intensifying, Ward et al. (2021) are careful to indicate that there is a misalignment of knowledge without classifying one as wrong or inaccurate. Ward et al. (2021) acknowledge the limitations of scientific data and argue that identifying misalignments between scientific and local knowledge can help avoid some of the challenges associated with managing complex socio-ecological systems.

2.6.2 Marine ecosystems change in the Cape Agulhas region

There have been several historically observed regime shifts relevant to small-scale fishers in the Southern Benguela. In the early 1960s there was a dramatic shift in the area's marine ecosystems in what has largely been attributed to overfishing (Howard et al., 2007; Blamey et al., 2012; Ward et al., 2021). In contrast, the second regime shift in the early 2000 was driven more by environmental forcing in the form of anomalies in sea surface temperature, upwelling and the prevalence of Benguela Niños, with fishing only acting as a secondary driver (Howard et al., 2007; Blamey et al., 2012; Ward et al., 2012). This second regime change impacted a number of species including an eastward shift in sardine populations (Howard et al., 2010). Changes in small pelagic fish regimes have widespread impacts on ecosystems including their predators, yellowtail (*Seriola lalandi*) which is a key target of the small-scale fishers in the Cape Agulhas region (Dunn, 2014). The disparity in the causality of the two major regime changes that have been observed and recorded in literature dedicated to the area of study provides insight into the uncertain climate futures in the Cape Agulhas region.

The decline in fish stocks led to the declaration of an emergency in the linefishery in 2000 (Duggan et al., 2013). This, in turn, caused a mandatory reduction in fishing effort by 70%. Blamey et al. (2015) note that in some fisheries, fishing effort began declining before the emergency, indicating regime shifts or stock declines that predated the emergency for decades. Linefishers in the region largely rely on pelagic shoaling species such as yellowtail (*Seriola lalandi*) and demersal species like kob (*Argyrosomus inodorus*) which Blamey et al. (2015) characterize as erratic due to their wide ranges. As an adaptation to changes in shoaling fish availability, fishers regularly switch strategies and target more residential reef fish like carpenter (*Argyrozona argyrozona*), which are slower growing, long-lived, and slower to reach sexual maturity (Blamey et al., 2015). These SSF strategies can be seen as maladaptive when they lead to the population collapse of reef fish stocks as was the case with red steenbras (*Petrus rupestris*) and other species (Blamey et al., 2015; Griffiths, 2000).

While scientific knowledge of fish stocks is derived largely from fish catch data, there is a lack of scholarship dedicated to assessing stock health using local knowledge in the Agulhas Bank. Additionally, quota allocation in South Africa is derived from scientific data with no consideration of local knowledge (Sowman and Sunde, 2021). This science-dominant approach comes despite the Small-Scale Fishing Policy mandating community-run regulation (Sowman and Sunde, 2021). Additionally, local fishers regularly contest regulations arguing that government regulations do not align with knowledge of local stock health (Sowman and Sunde, 2011; Isaacs 2011). National assessment of a particular species may indicate that the population is well below what would be commercially viable by government while a narrower scoped assessment in certain fishing zones could reveal greater abundance (Punt, 2019). Götz et al. (2014) argue that the exclusion of local knowledge in favor of regulation guided by catch data and fishing effort fails to capture the whole picture of ecosystem dynamics. They note that much of the change in the Agulhas Bank catch totals and fishing effort are rooted in the increasing cost of fuel since 1994 and the influence of regulations themselves (Götz et al., 2014). Even more problematic is regulation that ignores both local knowledge and scientific best practices like the policy which allows for extensive undersized bycatch leniency in the highly intensive trawling sector, compared to the strictly enforced size minimums in the linefishery which has much lower catch totals per unit of effort (Gammage et al., 2017).

2.7 Literature review conclusion

This literature review has assessed fisheries scholarship beginning with a broad focus on the global SSF sector, then looked at the sector in South Africa and finally in the Cape Agulhas region. Local and

traditional knowledge scholarship has been reviewed as well as literature dedicated to LTK in the area of study. An assessment has been made of pre-colonial, colonial, apartheid era and democratic era fisheries in South Africa and the Cape Agulhas region. The role of mapping in fisheries management has been reviewed, including the state of marine spatial planning in South Africa. Lastly, scholarship on environmental change in the Cape Agulhas region has been identified and reviewed, focusing on ecosystems change and climate change in the marine area used by SSFs. The next chapter will outline methodological approaches of this study.

Chapter 3: Methodology

3.1 Introduction

The research methodology for collecting and analyzing local and traditional knowledge will be discussed in this chapter. The reasoning behind choosing a multi-site case study approach to research will be outlined. Focus groups, key informant interviews and participatory mapping surveys were used as the primary data collection methods which will be contextualized in the literature to demonstrate knowledge of best practices. Limitations to the study will be discussed as well as ethical considerations. This research's contribution to the advancement of methodology for mapping small-scale fishing local and traditional knowledge will be discussed in the conclusion.

3.2 Research approach

Prior to conducting fieldwork, a scoping visit to the two communities of study was carried out by the researcher and facilitated by the research supervisor, Professor Philile Mbatha. Mbatha had established relationships in the region based on past research and supervision. It was determined that an in-person introduction from the supervisor would be more impactful in helping the researcher establish the relationships necessary for successful case study work. The supervisor and researcher agreed that it was invaluable to convey as much respect as possible for the communities of study, particularly in the context of research fatigue, as well as historic injustices which were to be a subject of investigation. Without this in-person introduction, and deliberate facilitation creating personal connections, it is likely that the ethnographic research conducted in this study would have been significantly more difficult and potentially been a source of conflict in the communities of interest. For these reasons, it is encouraged that future research of this kind follows a similar approach to cultivating relationships of understanding and respect.

3.2.1 Case Study Approach

The primary area of study was Struisbaai, Western Cape, South Africa where a history of fishing is well documented. Additional research was conducted in the nearby village of Buffeljagsbaai, a community that was theorized to have overlapping, yet divergent, marine resource reliance. A week was spent conducting research in Struisbaai followed by an additional three days in Buffeljagsbaai. The research was conducted in the autumn of 2022 from the end of April to the beginning of May, toward the end of winter yellowtail season and before ski boat fishers depart for the West Coast to target summer snoek.

This time was chosen to minimize disruptions of fishing and ensure the maximum number of participants.

The decision between a single case study and multiple case studies approach was influential on the outcome of the research. A single case study affords more opportunity for in-depth engagement while multiple case studies allow for the comparison of replicated research (Savin-Baden and Major, 2013). By choosing a primary community of study in Struisbaai and a secondary case study in Buffeljagsbaai, effort was made to have comparable data between the two while allowing for a deeper level of engagement at the primary site. This asymmetrical approach naturally led to a greater depth of data captured in Struisbaai with more limited findings from Buffeljagsbaai. The benefit of this approach was seen in the way some trends from site one were shown to be indicative of trends to the region and sector, while other results appeared to be unique to the individual communities. This parity of trends and exceptions allows for an analysis that addresses both commonality of fishers' experiences and the need for policy that acknowledges the nuances from one community to the next.

3.2.2 Triangulating quantitative research

This study seeks to collect and assemble cultural data from small-scale fisherfolk and test methodology for doing so. The research was structured as a mix of focus groups, semi-structured interviews, expert interviews, and digital mapping surveys. This latter method was conducted using SeaSketch, a software specifically developed for multi-stakeholder engagement for marine spatial planning (MSP). The integration of multiple research methods can be beneficial as qualitative and quantitative results can complement one another and improve the resolution with which different issues are understood (Gable, 1994). Additionally, data triangulation has been shown to illuminate knowledge gaps and mismatches amongst different types of knowledge (Ward et al., 2021; Tengo et al., 2014). The use of qualitative and quantitative ethnographic research has been shown to assist in the validation and comparison of findings when working with marine resource users (Wynberg et al., 2014).

3.2.3 Testing innovative participatory mapping software

SeaSketch was designed by McClintock Lab at the University of California Santa Barbara in the United States. Initially developed in 2013, the software has since been used in theoretical and practical applications around the world. However, to date there is limited published research on SeaSketch. The software has several features designed to translate diverse data sets into spatial outlays in ways that have typically been absent or rare in MSP. The participatory, user-friendly focus of the software was

deemed to be of intrigue in the context of South African MSP where in-depth, community-level engagement is lacking and where spatial data is often prioritized over other knowledge types that are not as easily mapped.

3.3 Data Collection and sampling techniques

3.3.1 Sampling

As an outsider to the Cape Agulhas region, it was essential the author built meaningful connections with the local communities and cultivated trust. An in-person introduction from the researcher's supervisor, who had past connections in the area, helped facilitate relationship building. Trust was also improved by the employment of multiple local translators who also worked as liaisons scheduling interviews and finding participants. All liaisons either worked in fishing or had close family members who do so, helping bridge the gap between outsider and local experts. The employment of community-based field assistants is a way of providing some tangible benefit from the research in addition to assisting with the contextualization of information discussed (Wynberg et al., 2014).

Sampling of participants was a co-production exercise, with community liaisons helping identify and assemble community members with diverse but relevant perspectives to the study. It was determined that there should be effort to represent fishers who worked on ski boats⁷ and those who worked on *chuckies*⁸ and also to distinguish between those who were born locally and those who have moved to the area. Demographically, the sampling of fishers appeared relatively homogeneous but was representative of the small-scale fishers of the area, who like the survey population, are almost entirely older, male, and coloured.

Table 3.1 Sample numbers

| Research Method | Number Conducted | Total Participants |
|-------------------------|------------------|--------------------|
| Focus group | 5 | 22 |
| Mapping survey | 6 | 6 |
| Key informant interview | 4 | 4 |

⁷ More modern boats that are put in and out of the water using a trailer and enable a more mobile fishing fleet.

⁸ Traditional wooden fishing boats that remain in harbor attached to moorings. They travel more slowly and are generally not brought to other harbors to target migratory fish.

3.3.2 Focus groups

Before conducting the survey, focus groups were organized in Struisbaai to refine the questions being asked. A focus group is a qualitative research method often used in the conservation field that assembles a specific group of people to foster understanding about a particular subject (Nyumba et al., 2018). Rather than aiming to be statistically representative with widespread demographic sampling, focus groups put greater emphasis on expertise and perspective relevant to research questions. This study began in Struisbaai with two discussions, with 3-5 fisher-led focus groups which enabled the researcher to identify survey questions that needed to be removed, added, or adjusted. A particularly useful element of these focus groups was a timeline exercise that asked the groups to identify key dates in their histories as fishermen. The timeline thus yielded 5 periods of change which fishers felt affected fishing over the course of the majority of their careers; pre-1980, 1980-1990, 1990-2000, 2000-2010, 2010-present. Each decade span was seen to be a time in which outside forces impacted fishing livelihoods in the community. Pre-1980 was defined by the impacts of the Group Areas Act; 1980-1990 was defined by high catch rates and limited regulation; 1990-2000 was defined by the transition to democracy, increased regulation, and the influx of competition from outside fishers; 2010-present has been defined by declines in catches and ongoing regulatory challenges. Using this information, the survey was tweaked in a way to identify changes in fishers' experience from decade to decade spatially and temporally.

Focus groups proved helpful in creating a space in which community members could comfortably engage and share perspectives. The initial research plan was to begin with two focus groups and then switch to one-on-one interviews. The translators/community liaisons opted to organize additional group discussions, citing a belief that it would enable a greater exchange of information. In addition to making community members more comfortable by meeting them on their terms, this approach also enabled the interaction of fishers and non-fishers. On the last day in Struisbaai a group of community members was assembled comprised of handliners and a local historian, leading to a rich dialogue and the exchange of ideas among diverse groups with a previously established rapport. In Buffeljagsbaai, a group of three fishers was assembled to discuss issues facing the sector, with the community liaison stressing that it would be more advantageous than individual interviews. Similarly, a family was interviewed in a separate Buffeljagsbaai focus group leading to diverse perspectives on the familial impacts of the sector. Per focus group best practice, the researcher adopted the role of "facilitator" rather than "investigator" in these focus groups, allowing conversations to flow with the will of the group (Nyumba et al., 2018).

Table 3.2 Focus groups

| Date | Focus group | Code | Participants |
|----------------|--|---------------|---|
| 27 April, 2022 | Struisbaai Small-Scale Fishers Crew | FG SB 1, 2022 | 3 male fishers, 2 female family members |
| 28 April, 2022 | Struisbaai Small-Scale Fishers Skipper, Crew and Fish worker | FG SB 2, 2022 | 3 male fishers, 1 male fish worker, 2 female family members |
| 3 May, 2022 | Struisbaai Crew, Skipper and historian/ PhD Candidate | FG SB 3, 2022 | 3 male fishers, 1 female researcher |
| 3 May, 2022 | Buffeljagsbaai Small-Scale Fishers | FG BB 1, 2022 | 2 male fishers, 1 female family member |
| 4 May, 2022 | Buffeljagsbaai Small-Scale fisher family | FG BB 2, 2022 | 1 male fisher, 2 female family members |

3.3.3 Mapping survey interviews

The survey function of SeaSketch was isolated as the most important element of the software to be used in the initial community engagement stages, while other tools could be useful in the future. The software offers several customizable survey templates focused on gathering information on existing human uses and opinions on future management plans. In preparation for the fieldwork, the “Marine Resource Use Survey” was designed based off the existing “Human Use Survey” template. While the existing template is aimed at gathering a diverse array of marine ecosystem engagement perspectives, including a large recreational component, the survey used for this study was modified to gather information specifically from small-scale fishers.

The “Marine Resource Use Survey” aimed to gather local and traditional knowledge and perspectives of marine resource management on both spatial and temporal scales. The mapping component of the software was deemed to present a unique opportunity for novel research. Scholarship on mapping local and traditional knowledge is limited in relation to literature dedicated to mapping ecological and economic information (St. Matin and Hall-Arber, 2008; Noble et al., 2019). This discrepancy mirrors inequities between different knowledge types, where scientific data receives more funding and sway over cultural data that is often not considered or even collected (Tengo et al., 2014). While there is a

push to collect more cultural data to improve marine resource management, it must be coupled with methodology that enables it to be easily input into the MSP process (Hill et al., 2020; St. Martin and Hall-Arber, 2008).

The SeaSketch survey used for this study can be broken into three parts. The first section is biographical, collecting information on each fisher's age, place of birth, family history, experience learning to fish, and fishing methods. When conducting the survey, this section was the most straightforward, leading to brief responses and limited confusion among researcher, translator, and interviewee.

Section 2 of the survey was the most in-depth and involved mapping where fishers currently fish, and where they fished in the past, focusing on the dates identified in the focus groups. The researcher and translator/facilitator communicated with the interviewee to draw polygons of zones fished and then asked fishers to define the importance of various spots. For example, 6-Mile Bank, 12-Mile Bank and 45-Mile Bank may be separately mapped for the present, 2010 and 2000. For each year the fishers were asked to allocate a total of 100 points of significance between all the spots to indicate where they spent the most time fishing during each period. The idea was to spatially demonstrate the ways fishing effort has shifted from decade to decade. This line of questioning was derived from the hypothesis that the impacts of environmental change and non-consultative fishing policy could be visualized spatially by mapping where handliners have concentrated fishing effort over the years.

Part 2 of the survey was the most challenging section, requiring a great deal of time to facilitate, with varying degrees of understanding among interviewees. While the software has the expressed purpose of being user-friendly, limitations arose from minimal map literacy among translator/ facilitator and interviewee, as well as the researcher's limited knowledge of place names. The time and difficulty of conducting this part of the survey often led to fatigue among facilitator, interviewer, and interviewee as well as shortcuts that may have compromised the spatial accuracy of mapping (for instance, best guesses had to be used to determine where 6-Mile Bank ended, and 12-Mile Bank began).

Part 3 of the survey was more easily facilitated, asking questions geared at local and traditional knowledge that were answered on sliding scales, and in "yes" or "no" fashion. This section focused on quantifying fishers' experience with climate change, government engagement, policy, and fishing livelihoods. The questions were more easily understood than the mapping section and could often be answered quickly. Other times the questions inspired interviewees to expound on various experiences, telling stories and leading to rich discussions and insightful tangents. Part of this section linked to

Section 2, for example, asking participants how many days a week they ate fish in 1980, 1990, 2000, 2010 and the present, in an attempt to understand changes in food security and its possible relation to spatial data. The survey was concluded with an open-ended hypothetical question, asking fishers whether, if given the chance, would they create an MPA in the area, what the boundaries would be, and what activities would be allowed or restricted.

Table 3.3 Mapping survey interviews

| Date | Interview Participant | Code | Demographics |
|----------------|-----------------------|---------|--------------|
| 29 April, 2022 | Struisbaai Fisher | MS SB 1 | Male 55 |
| 30 April, 2022 | Struisbaai Fisher | MS SB 2 | Male 49 |
| 30 April, 2022 | Struisbaai Fisher | MS SB 3 | Male 54 |
| 30 April, 2022 | Struisbaai Fisher | MS SB 4 | Male 62 |
| 30 April, 2022 | Struisbaai Fisher | MS SB 5 | Male 26 |
| 1 May, 2022 | Struisbaai Fisher | MS SB 6 | Male 56 |

3.3.4 Key informant interviews

Four key informant interviews were conducted to provide additional context for this research. Key informant interviews are one of several interview-based sampling methods, defined by the targeting of individuals deemed to be knowledgeable about a particular element of research goals (Newing, 2010; Young et al., 2017). Methodological debates regularly discuss the differences between key informant interviews and expert interviews, with the discussion often revolving around the challenge of defining who is and is not to be considered an “expert” (Döringer, 2021). This study embraces the belief that local handline fishers are the epitome of experts on SSF. To differentiate between experts who work as SSFs and those adjacent, this study refers to the latter as key informants and the former as fishers or SSFs. While the perspective of local fishers makes up the foundation of this research, particularly with its focus on local and traditional knowledge, the supplementary perspective of folks working in civil society adjacent to the sector helps validate qualitative data gathered in fieldwork with fishers in the communities of study. These key informant interviews also provide additional context to the way the sector is connected to broader elements of society.

Key informant interviews were conducted with members of NGOs, cooperatives, and business – all focused on SSF governance, to various degrees. The first expert interview in Struisbaai was with an

employee of Abalobi, a mobile application dedicated to strengthening fishers' profits through market empowerment. The second key informant interview in Struisbaai was with a PhD researcher from the community who was also studying local knowledge held by fishers in the Cape Agulhas region. In Buffeljagsbaai, one key informant interview was facilitated with a leader of Blinkwater, a cooperative that makes and sells products from the local marine and terrestrial environments. The final key informant interview was with a member of the community kelp cooperative, which collects, processes, and exports the macroalgae.

Table 3.4 Key informant interviews

| Date | Key Informant | Code | Sector |
|-------------|--|--------|-------------------|
| 1, May 2022 | Abalobi – representative | KI A | Social enterprise |
| 3 May, 2022 | Local PhD Researcher | KI UWC | Academia |
| 4 May, 2022 | Blinkwater Cooperative representative | KI BW | Cooperative |
| 5 May, 2022 | Buffeljagsbaai kelp cooperative - representative | KI K | Cooperative |

3.3.5 Additional Observations

At times, participants were not available for interviews or surveys, leaving time for observing relevant spaces and activities in the Cape Agulhas region and supporting research findings through related experiences. In both Struisbaai and Buffeljagsbaai, several transect walks were made to view places of historic or ongoing marine resource usage, as well as areas where past injustices occurred. Additionally, a visit was made to the Shipwreck Museum in Bredasdorp, the center of Cape Agulhas local municipality, to observe how other forms of maritime culture are being interpreted and celebrated in the area. The actively used fish traps of Arniston, east of Struisbaai, were visited to compare with the abandoned traps in the communities of study. A day was spent at sea working with Struisbaai fishers and observing traditional handlining methods. The author also helped scale and gut the day's fish catch in Buffeljagsbaai to gain a better understanding of post-capture activities. These hands-on, observational

activities helped generate a fuller picture of how local and traditional knowledge remains central to the small-scale fishing experience and the broader Cape Agulhas region as a whole.

3.3.6 Desktop review of LTK held by fishers in the Cape Agulhas region

A literature review of local and traditional knowledge related to small scale fisheries in the Cape Agulhas region was conducted to complement the field work of this study. Using Google Scholar as the primary search engine for this review, several key word searches were conducted to identify appropriate matches. Given the limited amount of research conducted in this geographic area, an evaluation of all publications focused on Struisbaai and Buffeljagsbaai was possible. Once all the research dedicated to the communities of study was identified, publications were then evaluated to determine which were relevant to this study. Several of the most pertinent studies included unpublished master's theses, which were given equal attention as sources found in formal academic journals, given the greater abundance and depth of information presented in the former. Additional knowledge was uncovered in research conducted near the area of study, but not directly in the Cape Agulhas region. This literature review helped provide background information on LTK in the Cape Agulhas region, including knowledge on fisher livelihoods, environmental change, and historic injustices.

The Master's research of Parker (2013) involved some similarities to this study as it engaged in oral history interviews, focus groups, and expert interviews to uncover human dimensions in the Struisbaai small-scale fishery. The study captures the way Struisbaai fishers put high cultural value on marine resource extraction, suggesting a high degree of cultural knowledge in the area that is not explicitly assembled in the study (Parker, 2013). The master's research of Ismail (2022) is also quite relevant to this study as it uses interviews and focus groups in Buffeljagsbaai as a way of conducting assessments of coastal risk and adaptive capacity. Further, the study assesses the community's relationship with governance institutions and the positive and negative impacts they have on people's livelihoods (Ismail, 2022).

The study conducted by Jarre et al. (2017), aimed at identifying multiple stressors for Southern Cape handline fishers, helps inform the background of this study. The geographic scope of the study ranges from Mossel Bay and Witsand – 50 km east of the focus of this research (Jarre et al., 2017). While the physical spaces do not overlap, the themes of the research coincide, as Jarre et al. (2017) use expert interviews and focus groups with SSFs in the region to uncover local perspectives. The investigation of climate perceptions within diverse knowledge systems within the Southern Cape and Agulhas Bank by

Ward et al. (2021), offers additional insight relevant to this study. The geographic scope adopted by Ward et al. (2021) is more closely aligned to the research of Jarre et al. (2017), yet provides similar insight, as it is an area directly adjacent to the geographic scope of this study (Ward et al., 2021). In addition to its geographic proximity, the study is significant due to its overlapping methodology and objectives. Ward et al. (2021) engage in a diverse knowledge study that draws on local resource users in the area, including small-scale fishers.

The Cape Agulhas National Park chronicles a long running history of marine resource usage in the Cape Agulhas region drawing on ancient shell middens and fish traps as evidence (Kraaij et al., 2009). Archeological and oral history evidence of fish trap usage in the area was also documented by Avery (1975). The study interviewed several men who were around 60 years of age in 1975 and traced fish trap usage in their family back at least three generations (Avery, 1975). Meanwhile, Hine et al. (2010) studied the contents of ancient waste middens adjacent to fish traps in the area as a way of dating the use of the technology.

3.4 Analysis methodology

Findings from this research were analyzed thematically, grouping the data for organizational purposes (Gammage et al., 2017). To assess findings of interviews, all recordings were transcribed and translated to English when necessary. A keyword search was then conducted for the creation of word clouds that helped reveal main themes identified in various discussions. This analysis methodology was influenced by the work of Ward et al. (2021) who ranked the degree of stressors into three tiers based on the percentage of times they were mentioned by interviewees while assessing local perceptions toward climate change in the Southern Cape. In addition, quantitative data from surveys was evaluated to validate and identify mismatches with qualitative interview results. Map data was reviewed to test theories of change related to spatial distribution of fishing effort. Map data from the surveys were also overlayed with existing spatial data available through the DFFE for additional triangulation (Karnad, 2022).

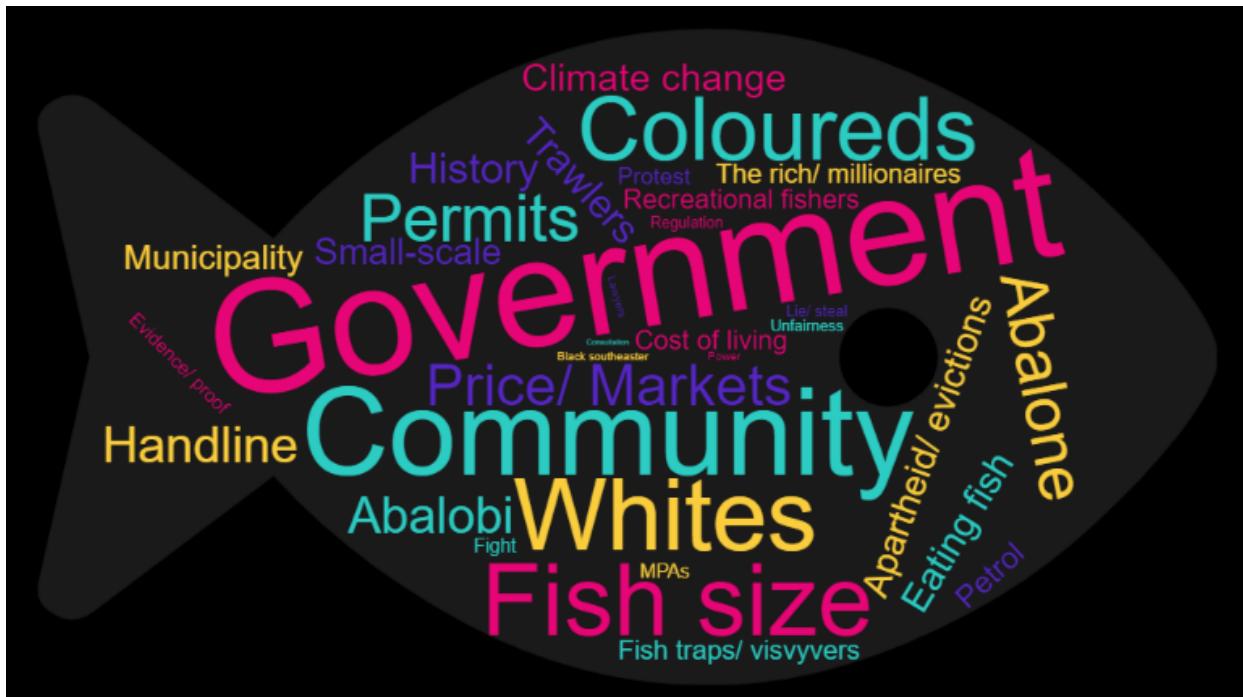


Figure 1.1 Word cloud generated from the interview, survey, and focus group field work. The size of words is proportionate to the frequency with which words and phrases were used. All recordings from key informant interviews, mapping surveys and focus groups were translated and transcribed into a fieldwork transcript for content analysis and theme identification (Author).

3.5 Research Limitations

There were several limitations to this study that inhibited survey completion in particular. As this research was conducted for a master's dissertation of 20,000 words with a research budget for a week and a half of fieldwork, there were logistical challenges that prohibited the level of engagement required to generate more robust data. It is theorized that the tedious nature of the mapping survey, particularly section 2, may have limited the number of fishers who were willing to participate in the survey as word spread among fishers about the experience. The translators/facilitators also demonstrated some unwillingness to organize survey sessions, and instead more often organized group and individual interviews despite the researcher's attempts to accumulate more mapping survey participants. Ultimately the research was flexible to the needs and comfort levels of the community and adapted accordingly. In total 6 surveys were conducted, whereas 18 fishers participated in focus groups. All surveys were conducted during the week spent in Struisbaai. The researcher deemed it inappropriate to attempt surveys in Buffeljagsbaai where a three-day time constraint hindered the relationship-building process necessary for such an in-depth endeavor.

The length of the SeaSketch survey led to capturing a large amount of data from a few participants, whereas a shorter survey may have had the inverse trade off. The support team at SeaSketch recommended allocating approximately one hour per survey – an estimate that ended up being quite accurate. While the relatively small sample size for the survey suggests an approach that shrinks the length of the 50-question survey, the length was only one of many factors that inhibited the completion of more questionnaires. Reducing the survey length may not necessarily have led to the completion of more and would have diminished the amount of information gleaned from each participant. The survey process would have likely benefited from map literacy and orientation training for the facilitator and translator prior to conducting interviews. While there were no issues in this case, future use of the technology may be limited by computer and internet requirements.

As is the case with all ethnographic research, the strength of this research was largely rooted in the strength of relationships in the communities of interest. As stated previously, the researcher largely benefitted from an in-person introduction from their supervisor who went above and beyond to visit the field on a scoping trip. The existence of strong interpersonal relationships with the supervisor and members of the community enabled a level of trust and mutual respect that would have likely taken more time and effort to cultivate. Future research of this kind should be facilitated by similar in-person introductions from a trusted connection to the community. Ideally, this study would have been participatory not only in its knowledge production, but also in the analysis process. However, limited resources and geographic constraints prohibited more robust engagement on this front.

While successful research oriented toward collecting cultural data may benefit from a researcher being connected to the culture, in this case there are some ways in which the researcher may have benefited from being an outsider and foreigner. Participants regularly expressed distrust and frustration with large portions of the South African population, including government, researchers, and white people as a result of past and ongoing injustices. Despite being white and associated with a South African university, the researcher was afforded considerable grace and hospitality from the community: being invited into fishers' homes and being taken to sea to experience a day of traditional fishing. Several times fishers expressed a dissatisfaction with the limited reconciliation and restitution that has transpired since apartheid ended. As such, a white South African researcher may have had more difficulty building the trust needed to conduct this kind of survey. While it may remain difficult to overcome a distrust for academics and researchers associated with government, the important and complex role of trust in such studies underscores the need to expand the access to higher education opportunities for South African

racial groups which are historically underrepresented. In a similar vein, there was an expressed distrust for South African researchers as a whole, who were perceived to be on track for careers in government.

3.6 Research Ethics

The researcher applied for ethical clearance through the University of Cape Faculty of Science and was granted approval prior to conducting fieldwork. While ethical considerations have already been discussed in section 2.2.2, it is incredibly important to understand the ways in which this kind of research must be handled with sensitivity as it has the potential to bring hardship and trauma back to the surface for participants. While there were several fishers who agreed to participate in the study, many were skeptical toward inquiries and showed signs of research fatigue. Many participants recalled partaking in past studies with academics, yet few experienced any form of feedback on the research they helped support – a violation of research ethics standards. Because of this, research had to be conducted with an additional degree of sensitivity, and participants had to be reassured that they could engage on their own terms and opt out of any elements they wished. Ideally, a study of this kind would have engaged participants multiple times, working toward a strengthened relationship of trust before conducting surveys. The scoping visit conducted prior to the fieldwork with the research supervisor was adopted to help alleviate some of the mistrust in the communities of study.

3.7 Conclusion

Among the most important outcomes of this study is its contribution to refining methodologies for collecting spatial cultural data, rather than generating statistically significant data itself. MSP goals can only be successfully achieved if they are coupled with a push to enhance the ways in which cultural data can be mapped alongside knowledge types that have historically received more prioritization and investment and which are more easily displayed spatially (Tengo et al., 2014; Karnad, 2022). A push to prioritize local and traditional knowledge and co-produce maps is likely to help with that process. Often, map co-production has relied on hand drawn-maps as a way to avoid barriers presented by technology and lack of education (Emmel, 2008.). Acknowledging and addressing these barriers is critical when working with groups with limited educational opportunities and map and computer literacy, such as fishing communities. Still, the ability of that knowledge to shape planning, policy and management will likely be limited if it cannot be translated into GIS format, which is often used by powerful decision makers (Brown et al., 2020). SeaSketch is explicitly designed for this challenge yet posed new obstacles in this trial. Further research should be done to compare the efficacy of transforming hand-drawn, co-

produced maps into the digital realm in contrast to the direct co-production of digital maps created on the SeaSketch platform.

Much of the value of this study stems from the ways in which qualitative data is generated in the oral histories that come out in the process of attempting to generate spatial data. The time it took to conduct each survey varied from 20 minutes to more than an hour. Some of this variability can be attributed to the ease with which participants understood the technology and questions being asked. Much more of the variability was derived from conversations sparked by various questions. Each survey involved participants telling stories about their experiences in ways that the questions were not explicitly designed to capture. Responses from participants ranged from dissecting fishing policies in contrast to their own time at sea, to family members' experience with forced removals. Several of the conversations that sprang from the surveys were recorded, enabling the revisit of discussions and the extraction of key points. A number of participants discussed an appreciation for the opportunity to air grievances and the belief that the questions and conversations dislodged forgotten memories. There is inherent value in a process that helps a marginalized community remember histories, especially in the context of the erasure and disassociation with knowledge and culture that took place under colonization and apartheid.

Chapter 4: Results

4.1 Introduction

This multi-method research yielded several key findings that are supported by quantitative and qualitative data. A main theme revealed by the fieldwork is the role historical context plays in shaping the experiences of small-scale fishers in the Cape Agulhas region. Additionally, environmental change was a common recurring theme in interviews, surveys, and focus groups. This chapter will begin with a discussion on the ongoing marginalization and exclusion of local and traditional knowledge from which these other issues are seen to be based. Finally, the results of surveys are spatially configured to the extent possible in order to frame findings in the context of shifts toward MSP approaches to marine resource governance.

This study drew upon the knowledge of 24 different participants. 18 different small-scale fishers were contacted, 6 of whom completed a participatory mapping exercise. All of the mapping surveys were conducted in Struisbaai, while 4 of the fishers interviewed were from Buffeljagsbaai. There were 4 expert interviews conducted and 2 family members of fishers included in the study. 100% of participants identified as coloured. Half of the fishers surveyed work on *chuckies* and half work on ski boats. A breakdown of the various research participants and methodologies is shown below in table 4.1.

Table 4.1 Participants and methodology

| Participant Affiliation | Research Method | Number Conducted | Number of Participants | Location | Year | In text Citation |
|------------------------------|--------------------|---------------------|---------------------------|----------------|------|--------------------------------------|
| Abalobi | Key Informant | 1 | 1 | Struisbaai | 2022 | (KI-Abalobi, 2022) |
| Blinkwater | Key Informant | 1 | 1 | Buffeljagsbaai | 2022 | (KI-Blinkwater, 2022) |
| Kelp Cooperative | Key Informant | 1 | 1 | Buffeljagsbaai | 2022 | (KI-Kelp Coop, 2022) |
| PhD LTK Researcher | Key Informant | 1 | 1 | Struisbaai | 2022 | (KI-PhD, 2022) |
| Small-Scale Fisher | Mapping Survey | 6 | 1 | Struisbaai | 2022 | (SB MS, 2022) numbered 1-6 |
| Small-Scale Fisher | Focus Group | 3 | 3-4 | Struisbaai | 2022 | (SB FG, 2022) numbered 1,2,3 |
| Small-Scale Fisher | Focus Group | 1 | 3 | Buffeljagsbaai | 2022 | (FG-SSF Buffeljagsbaai, 2022) |
| Small-Scale Fisher Family | Focus Group | 1 | 3 | Buffeljagsbaai | 2022 | (FG-SSFF Buffeljagsbaai, 2022) |

4.2 Marginalization of local and traditional knowledge in Cape Agulhas fishery governance

In attempting to identify and assemble local and traditional knowledge, this study generated many conversations on how such knowledge was being threatened and ignored. Fishers, by nature of the

profession, have deep relationships with nature – the crux of what many local and traditional knowledge studies try to understand (FAO, 2015; Nalau et al., 2018). However, the fishers of the Cape Agulhas region have been so consistently subjected to oppression that it was impossible to assemble said knowledge without discussing how it is imperiled. This study had the goal of identifying customary rights and traditions that might help garner legal protection for the fishers of the Cape Agulhas region; however, it is clear that a great deal of knowledge has been buried by colonization and apartheid which eroded the social fabric of communities (MS SB 3, 2022). It is more than likely that a significant amount of LTK has already been lost by divorcing fishers from their ancestral way of life and disrupting traditions through the rule of law. Additionally, some participants discussed how extractive research approaches that fail to return knowledge to the community also undermined efforts to preserve local knowledge. A fisher in Struisbaai said, *“It’s no use, you taking out knowledge and we don’t get feedback and it doesn’t get put on something that’ll be there for the next generation. I mean something like that or in a book form which is easily accessible.”* (MS SB 2, 2022).

While the local and traditional knowledge of small-scale fishers in the Cape Agulhas region has been eroded by oppression, a great deal more is still held by the people of the region. Several participants spoke of their knowledge of stone fish traps known locally as *visvyvers*. While use of the traps was restricted under apartheid – leading to their abandonment – the knowledge of the practice has been retained by those who remember using them. Interviews revealed how there had been many *visvyvers* which were maintained by individual families (MS SB 3, 2022). When storms damaged the walls, it was the responsibility of families to repair them (FG SB 1, 2022). The traps were critical in supporting families, providing fish for consumption, and income on days when seas were too rough for boat-based fishing. Traditional custom dictated that if a family were to check their traps and find nothing, they were allowed to harvest fish from others’ traps, so long as they gave half to the family that maintained it (KI A, 2022; MS SB, 2022). One participant spoke of how fishers sometimes faced difficulty selling fish caught in traps and were only offered wine from farmers in the region (FG SB 3, 2022). This was viewed as a reason why alcoholism is widespread in the community (FG SB 3, 2022). Perhaps most telling about discussions around *visvyvers*, was the way younger translators regularly expressed surprise and interest in knowledge shared from the older generation about the fish traps, suggesting that the knowledge is in the process of being lost as more time passes since they’ve been used (MS SB 3, 2022).

There are several ways local and traditional knowledge is being ignored, oppressed, and erased in the Cape Agulhas region. When asked, “To what degree do you think fishing traditions are threatened in

your community?", with 1 being least threatened and 5 being most threatened, survey respondents had an average answer of 4 (MS SB, 2022). Meanwhile, the average answer was 1.17 when asked, "To what degree do you think fishing/government policy considers local and traditional knowledge?" with 1 being least considered and 5 being most considered (MS SB, 2022). Accordingly, interviews uncovered widespread frustration with the way local and traditional knowledge was being overlooked by the government. Addressing their knowledge of best conservation practices, one fisher argued, "*They [the government] must come and consult us. There must be consensus between the fishermen here. Let the fishermen decide.*" (MS SB 2, 2022). Instead, none of the participants of this study felt they had ever been consulted by the government in a way that influenced policy. Many felt the lack of consideration given to local and traditional knowledge posed an existential threat to their livelihoods, predicting how statutory policy was making handlining untenable, and projecting that the sector would disappear and not continue to function within a short time period (MS SB 3, 2022).

This research revealed several ways community members felt their endangered knowledge – and ways of life that help preserve it – could be better protected, despite the ongoing threats to it. Nearly every fisher interviewed for this research identified minimum catch sizes as an issue that ignored their knowledge while cutting into the viability of handlining (FG BB 2, 2022; FG SB 3, 2022; MS SB, 2022). Fish size was mentioned 26 times in the interview transcripts. Fishers were not opposed to minimum catch sizes in principle and acknowledged the need to protect breeding fish for the sustainability of fish stocks, with one fisher in Struisbaai saying, "*We agree there must be rules here, but ask us, we catch the fish.*" (MS SB 2, 2022). This reflects the commonly held belief among fishers in the area of study who argued that minimums were set too high – citing knowledge of fish reproducing at sizes well below the minimum. One fisher estimated that three quarters of the fish he catches are undersized, meaning they must be thrown back, rather than contribute to his income (FG SB 2, 2022). Many fishers rejected a catch minimum that was imposed without their consultation and in disregard of their local and traditional knowledge. This regularly led to a form of protest fishing where handliners retained undersized fish and found ways to sell them outside of established markets, risking fines, jail time, and the loss of their licenses (MS SB 2, 2022, MS SB 1, 2022).

It became clear over the course of this research that fishers were not opposed to regulation in principle, and actually sought to increase regulation in ways they thought would protect local and traditional knowledge and livelihoods. Chief among the proposed regulations small-scale fishers suggested were ways of controlling industrial and recreational fishing sectors (MS SB, 2022; FG BB 1, 2022, FG SB 1,

2022). Many proposed the creation of MPAs that excluded trawlers and limited the time recreational boaters could fish (MS SB, 2022). While this was a popular idea, it was also a proposition that many handliners doubted would ever come to fruition, citing the lack of political power they possess and the lack of political will dedicated to protecting their livelihoods and knowledge (FG SB 2, 2022; MS SB 3, 2022). Other fishers suggested the restoration of visvyvers fish traps, which had crumbled under apartheid and remained restricted in the present (FG SB 1, 2022). This idea was inspired by the nearby town of Arniston where the customary right to use fish traps has been restored, leading to a resurgence in their usage (MS SB 5, 2022). In general, it was widely believed that upholding local and traditional knowledge would be synergistic, as it would increase small-scale fishers' ability to make a living using said knowledge and thus increase the likelihood that traditions would be passed down to future generations.

4.2.1 The process of fishing in the Cape Agulhas region

A day at sea observing and practicing local fishing methods helped enrich understanding of local and traditional knowledge held by fishers. The day started before sunrise when the ski boat and its crew arrived at the harbor via *bakkie*⁹. As this research was not conducted in peak tourist season, the queue to launch the boat was relatively short, consisting of a half dozen small-scale fishing ski boats and a few recreational fishing vessels. Fishers each had their own section of boat to stand in, divided by wood and connected to an adjacent section for storing fish that were caught. On the boat ride out to 6-Mile Bank, fishers prepared their bait and gear. Fishing began by trolling thick monofilament line for yellowtail. When no yellowtail were detected via bites or landings, fishing methods switched to target bait fish. After the crew caught what was deemed to be a substantial amount of bait fish, the skipper piloted the boat to reefs expected to be the habitat of redfish and kob (*Argyrosomus inodorus*). The crew prepared bait in route, regularly sharpening knives on personal wet stones. When the fishing site was reached, the crew quickly began dropping weighted lines to the bottom. When a fish was hooked crewmembers skillfully pulled in the line, hand over hand as fast as possible while maintaining consistent tension. Occasionally the lines of different crew members became entangled but were separated through expressive communication and dexterous maneuvers.

While fish were caught throughout the day, landings were reported to be low by grumbling fishers. Periodically the skipper would change locales in an attempt to find new shoals of fish. Methods switched

⁹ Pickup truck

between trolling for yellowtail and bottom fishing for reef fish. Among the high-value species targeted, no yellowtail nor any cape salmon were caught in the 10 hours spent at sea. Only a handful of kob, red roman and red steenbras were brought in, with the majority of the catch consisting of lower value fish like silvers and bream. Returning to the harbor at the end of the fishing day, the boat was met by a gaggle of tourists taking pictures without permission. Some asked to buy fish but were refused on the grounds that it is illegal for fishers to sell to unregistered buyers. Less than half the catch was sold to Abolobi at above the market rate, while the rest was sold to a *langana*¹⁰ at a lower price. Half of each crew's profits were given to the skipper, who did not receive enough to cover the price of fuel. Some crew retained portions of their catch, including undersized fish, to eat with their families or sell discreetly among the community. The crew agreed it was a disappointingly typical day of fishing.

4.2.2 The use and neglect of traditional fishing in Cape Agulhas tourism industry

The town of Struisbaai is defined by its small-scale fishing sector, which is used to market the town as a tourist destination. Entering the town from the north, visitors are greeted with a billboard photograph of the brightly painted *chuckies* in the fishing harbor. Lamp posts have light-up outlines of boats and sea creatures. Restaurants and accommodations similarly attempt to charm visitors with photos and artwork of boats and crew. None of the participants of this study reported ever receiving any royalties from the artwork created in their likeness, and none of the skippers reported ever being consulted for consent in using images of their property for the commercial gains of others. While the appropriation of romanticized imagery of fishing by white wealthy business owners has left many in the community irritated, several residents of Struisbaai Noord acknowledged the role of the tourist industry in buoying a weak job market and fishing sector that is becoming increasingly unprofitable. Still, many fishers in focus groups and mapping surveys expressed frustrations that tourism is driving up the cost of living, including prices in the town's sole grocery store where one fisher said he regularly demands to pay half price rather than tourist rates (FG SG 2, 2022; MS SB 1; 2022; FG BB 1, 2022). Others were fearful that rising tourism would be the death blow to small-scale fishers through increased competition with recreational fishers and monied interests that seek to transform Struisbaai harbor from a working fishing port to a yachting destination. One fisher in Struisbaai predicted the transformation as if it is an inevitability, saying, "*The owner of that restaurant, Catch Cook, on the harbor there, he wants to make it a leisure place, where yachts can come; it's gonna be a tourist harbor... all those chukkies must go, that's what's happening here. And he's just waiting for how much he's gonna get out of the deal.*" (FG SB 2,

¹⁰ Buyer and seller of fish

2022). The ongoing displacement of the small-scale fishers by the tourist industry is reminiscent of the displacement that took place under apartheid and represents the slow violence of the colonial legacy in the region.



Image 4.1 A billboard in Struisbaai greets tourists with an image of the blue waters and vibrant fishing boats of the harbor as they make their way past the homes of fishers who were displaced under apartheid. Tourist infrastructure is located centrally near the harbor, while fishers are several kilometers away. The compensation displaced families have received is deemed insufficient, while no compensation has been given for the various ways SSF has been used to turn a profit, reflecting a need for restitution (GoogleMaps).

In contrast to the booming tourism sector in Struisbaai, the vacation industry in Buffeljagsbaai is almost entirely absent – posing its own slew of problems. The community lacks many of the services available in more populated and wealthy tourist towns in the area, like schools and grocery stores. Instead of having to pay tourist prices, residents have to travel an hour or more round trip to get essentials. There is a greater lack of economic diversity in Buffeljagsbaai as a result of lack of industries like tourism, making it so nearly every household is reliant on marine resources either through fishing, kelp harvesting, or the poaching or farming of abalone. And while Buffeljagsbaai does not have a tourism industry profiting off their likeness, there still are issues with recreational fishers crowding fishing spots or coming from afar to queue in the community boat launch.

The Cape Agulhas region attracts significant amounts of tourists through maritime heritage, but there are limitations to how the small-scale fishing sector is included. While the imagery of traditional fishers adorns billboards and brochures, there is little formal initiative and investment in linking the tourism and small-scale fishing sector. One mapping survey revealed fishers' inability to legally use boats for tourist fishing and sight-seeing trips (MS SB 6, 2022). Additionally, there are several public celebrations

of culture and history in the area; however they are largely skewed toward white European backgrounds. The Shipwreck Museum, north of Struisbaai in Bredasdorp, uses extensive resources to celebrate the dangerous coastline of the Cape Agulhas region, preserving the artifacts and stories of predominantly foreign sunken vessels. Here one can learn of the various nationalities that colonized the region after their ships ran aground, but very little is mentioned of the people who resided there prior to their arrival. The remains of shipwrecks are legally protected under South African law alongside other historic and prehistoric maritime artifacts which should include fish traps (National Heritage Resources Act No. 25, 1999). A focus group discussion in Buffeljagsbaai revealed how residents valued their cultural resources, with one participant saying, *"Buffeljags is a heritage place; it is a heritage place because why? Because they've got their traditional fishing rights. Like they fish in the ocean... There is no other places here, there is only fishing here; so it is a heritage area"* (FG BB 2, 2022). In the same conversation another participant replied saying, *"The government don't treat it like a heritage place, but the people, yes."* (FG BB 2, 2022).

Similar to the discussions on what type of knowledge is valued in marine governance, interviews and focus group discussions revealed a disparity in which types of heritage are commemorated and which are disregarded. Around Struisbaai, the remains of several fish traps are still visible while participants in this study have identified the swimming pools of Agulhas as former visvyvers that were demolished for recreational purposes (FG SB 1, 2022). This aligns with reports from the Cape of Good Hope which document the destruction of traditional fish traps for the construction of swimming pools, which were reserved for whites only until 1994 (Graham, 2016; Rogerson, 2017). A visit to Arniston, revealed more than a half dozen fish traps which appeared to be well maintained, representing some of the only intact specimens of their kind still in existence in South Africa (Hine et al., 2010). Despite these historic and cultural artifacts existing within the De Mond Cape Nature Reserve and their exceptional, functional condition, there is no signage informing the public of the living heritage they were likely to unwittingly miss. The failure to publicly celebrate the history of fish traps demonstrates the way colonial legacies maintain a hierarchy in which heritage is protected or neglected (Graham, 2016).

4.3 The influence of historic injustices on the Cape Agulhas region small-scale fishery

Interviews with small-scale fishers in the Cape Agulhas region regularly led to temporal framings in which issues of the present were contextualized by what happened in the past and what may be in the future. Handline fishing represents a control variable in a sea of change, as the fishing method has largely remained consistent for generations despite nearly everything else transforming for fishers in the

region (Attwood et al., 2013). Discussions with participants around local and traditional knowledge always led to identifying ways in which fishers' lives have changed over the years. While local and traditional knowledge studies tend to focus on people's relationship with nature, this study takes a more open-ended approach, acknowledging the value of all sorts of knowledge (Karnard, 2022). Of particular importance to this study was capturing local historical knowledge and identifying how past events have shifted the way people interact with nature. A key result of this study was cataloguing attitudes of people toward apartheid and more recent history to understand how environmental governance affects small-scale fishing in the area.

It is important to note that this study does not represent the sole attempt to catalogue local historical knowledge, as several community members have adopted the initiative of assembling local histories. Expert interviews were conducted with a local resident conducting her PhD research on local knowledge. Another community member became interested in the merit of historical knowledge through his work participating in the policy making process and helping fishers navigate permitting. He said, "*I realized there's not a lot of our history that's being recorded, especially not the oral component.*" (KI A, 2022). In these ways, this study builds on the local understanding that empowerment can come from strengthened local historical knowledge. Local historians expressed interest in leveraging historical knowledge to establish *bona fide* fishing rights, to reestablish practices and traditions lost during colonization and apartheid, and to build a case for restitution. This study aims to contribute to that process and address the appeals of a key informant who said, "*If you go to a community and write something up, take whatever you did and give it back to that community, because it's their history. In the past that was our big challenge; students would come in or people would come in or historians would come and ask questions and you never see it; you never see that information. It's lost*" (KI A, 2022). Accordingly, this research is committed to not only contributing to the academic field through a master's dissertation, but also by creating resources directly geared at assisting with community ambitions to establish and document local knowledge for their own benefit.

4.3.1 The impact of apartheid on the Cape Agulhas fishery

The history of fishing in the Cape Agulhas region predates apartheid and possibly colonization as a whole. However, historical analysis for the fieldwork conducted for this study begins with the limits of living memory of participants. The legacies of apartheid and colonization posed certain challenges for research oriented at identifying local and traditional knowledge, as both systems of oppression actively eroded knowledge bases by design. A prime example of this was revealed in a key informant interview

with the Struisbaai Abalobi liaison who recounted a tale of forced removals. When the apartheid government evicted coloured families, the bulldozers came to demolish homes with so little notice that people often were unable to save many of their possessions from being destroyed. He explained how one family recounted to him how, *“They had to [evacuate] in such a rush that they accidentally in the process didn’t take the Bible with them, so when they came back, the house was demolished. So, in that Bible is where their names is written. I’m talking about 1820, you know. So, he doesn’t know how far (back fishing goes)... In his mind he sees himself as a fourth-generation fisher on paper but he knows they’ve been fishing for many, many years.”* It was clear from many accounts that apartheid not only robbed people of their freedom in the present, but their connections to the past in a way that would affect future generations.

Interviews in Struisbaai revealed the way the fishers of the community and coloured people as a whole were systematically removed from the main part of town and forced to live in inferior housing in what became Struisbaai Noord. The ramifications of apartheid were revealed to affect nearly every aspect of life for fishers in Struisbaai, who used to be able to check sea and weather conditions from their homes by the harbor. *Image 2* below depicts the demolished remains of a coloured fisher’s former home on Harbor Road in Struisbaai with the rubble and weeds standing out in contrast to the multi-million-rand vacation homes adjacent to it. Removal to Struisbaai Noord was coupled with a pass system that limited access to many parts of the coast, including where people had used and maintained *visvyvers* – undermining their resilience and livelihoods. Research revealed how the prohibition of this practice has led to the decline of understanding on how the traps worked. *Image 3* below depicts the remnants of neglected fish traps in the background while in the foreground a shoreline cross harkens to lost lives and livelihoods.



Image 4.2 Just west of Struisbaai harbor, a vacant lot is seen with rubble from a coloured fishing family's home bulldozed during apartheid. Victims of forced removals were typically compensated just R24,000. Today, largely white-owned vacation homes like the one in the background are valued in the millions of rand while the shadow of this injustice is often overlooked (Author).



Image 4.3 Mirroring the ruins of homes demolished under apartheid, the crumbled rock walls of traditional fish traps remain in a state of disrepair just south of Struisbaai harbor. The traps historically were critical in supporting fisher livelihoods, but their use was banned, and access was restricted to them under the Group Areas Act. The traps were critical in providing a source of income and nutrition for fishers when high seas made boat-based fishing too dangerous. Ironically, a cross dedicated to a fisher lost at sea can be seen in the foreground of this photo while the fish traps languish in the background (Author).

Buffeljagsbaai was majority coloured before apartheid and was thus spared the hardship of forced removals, while experiencing other challenges and injustices parallel to the experiences recounted by Struisbaai fishers. In both communities, it was revealed that fishing had historically been considered a coloured profession for generations. However, during apartheid there was a shift in the fishery with white fishers taking over ownership of many boats, often hiring white skippers and employing coloured people as underpaid labor (FG BB 1; 2022, FG BB 2, 2022). Until skipper duties started to be taken back by coloured fishers in the 1980s, crews were at the mercy of those in power. One focus group in Struisbaai revealed how, “*(Fishers) never knew how much they would earn. They just had to be happy with what the white owner was giving them.*” (FG SB 2, 2022). The situation was the same in Buffeljagsbaai until coloured skippers ushered in today’s system of payment in which half of the crew’s catch goes to the skipper and half is kept by the crew (FG SB 1, 2022). This system is seen as fairer than the former practice but not necessarily more desirable because of decreased catches and low payment for fish relative to the cost of living.

Nearly every participant pointed to the impact of apartheid on the present. A telling example was in Struisbaai where a luxury retirement compound was built over an old, coloured burial ground (MS SB 1, 2022). Residents of Struisbaai Noord fought back, attempting to block the development, but were unable to recruit a lawyer to take their case due to lack of proof (MS SB 1, 2022). One participant in a case study reflected on how apartheid stripped them of that proof saying, “[We] can’t take the people to court without any evidence and they have a lot of power.” (FG SB 3, 2022). In regard to the impact of apartheid, another participant in the same discussion said, “It is not over, it’ll never be over” (FG SB 3, 2022). This loss of heritage, driven by a lack of proof represents the ongoing tragedy of apartheid in which past policies continue to erode local and traditional knowledge. The deep scars from apartheid are both practical – impacting policy – and physiological – shaping the mental health of the community as a whole. An Abalobi key informant in Struisbaai commented on the legacy of trauma saying, “I don’t think this community healed from that because nobody has dealt with the pain.” (KI A, 2022).

4.3.2 How the democratic transition impacted the Cape Agulhas fishery

The end of apartheid and the rise of democracy brought hope for fishers that has largely given way to frustration. Many fishers in focus groups and mapping surveys expressed a belief that there has been insufficient restitution since 1994. When forcibly removed, most coloured families only received R24,000 after being told they would be paid R48,000. Some resisted removal and received more compensation, though this too was deemed paltry in the context of the multi-million-rand value of the

homes in the neighborhoods where they used to live. The end of apartheid also ushered in coloured control of boat ownership and captaining in the Cape Agulhas region – a change that was supposed to make the distribution of benefits fairer (FG SB 2, 2022). However, many fishers interviewed in focus groups and mapping surveys expressed frustration with how it coincided with the decline of catches, drop in prices, rise in cost of living, and increased competition (FG SB 1, 2022; FG SB 2, 2022; FG BB 1, 2022; MS SB 4, 2022; MS SB 6, 2022). This frustration was coupled with a belief that the pathway to boat ownership was made unfairly difficult with high interest rates and a failure to account for past payments made toward the vessels (FG SB 2, 2022). The result was a long-deferred dream of independence and prosperity that was postponed until after fishing became far less profitable than it was during the apartheid era.

Despite the outright violence and oppression of fishers during apartheid, many participants spoke of how their lives have become more difficult since 1994. In the same conversation one fisher described the way people could be beaten for simply being coloured in the wrong place under apartheid, he expressed his frustration with democratic reforms saying, *“My family was 14 kids. People had big families, but everybody could survive; they had clothes, they had shoes, there was always something to eat. During apartheid, apartheid was good; there was work, there was law, no corruption.”* (FG SB 2, 2022). Throughout the focus group discussions and mapping surveys it was quite common to hear fishers discuss ways their lives have gotten worse since democratization (FG BB 1, 2022; FG BB 2, 2022; MS SB 1, 2022; MS SB 2, 2022). This sentiment was expressed in the form of political apathy where people have stopped voting because they feel they have no power to change their lives through democratic means (FG SB 3, 2022). Additionally, lack of hope for the future is captured in many instances of fishers speaking about how, despite long family histories of fishing, they have discouraged their children from joining the sector (MS SB 2, 2022; FG BB 1, 2022). There is a complexity to unfavorable comparisons between fishing in the democratic era versus the apartheid era, that stems from a myriad of governance, environmental, and economic factors. The feeling that some things have gotten worse in the democratic era should not be understood as stemming from an appreciation of apartheid itself. Instead, many community members lamented how apartheid was responsible for the unfavorable baseline that democracy has failed to ameliorate.

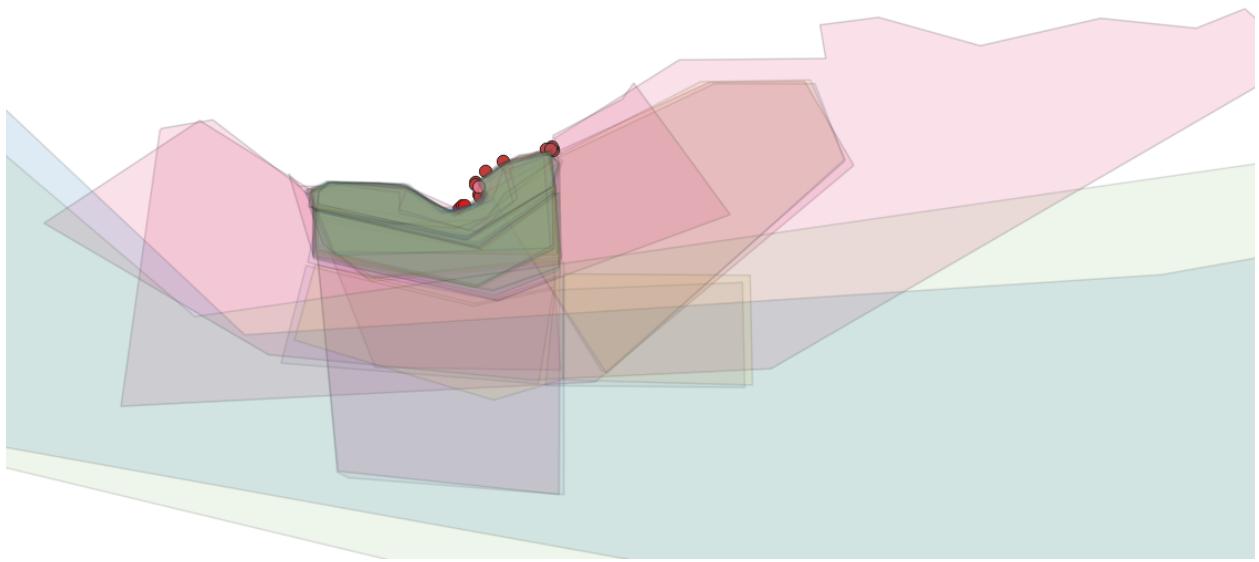
Despite the complexity driving frustrations with present day fishing when compared to eras bygone, the commonly held belief that things have gotten worse for fishers in the Cape Agulhas region since apartheid ended is a serious indictment of the democratic government worthy of further investigation.

The democratic government is blamed for enacting many unfavorable policies for small-scale fishers by nearly every participant in this study. The increase in controversial fishing regulation is associated by many as coming after the end of apartheid. Several fishers pointed to the zonation created under the MLRA as a driver of increased competition from outsiders with ski boats (FG SB 2, 2022; FG SB 3, 2022; KI A, 2022). Democratic era quotas were also criticized by the majority of participants who saw them as part of a policy that favored industrial trawlers over small-scale handliners. A community member in Buffeljagsbaai discussed the imbalance between how trawlers and small-scale fishers are treated saying, “*But who is checking the big boats at the back? They don’t get checked. They can just say this is our bycatch. But [if] we [small-scale fishers] have other species on the boat; go to jail.*” (KI BW, 2022). This sentiment captured the widespread frustration with industrial fishing and the policies that seemed to favor it, as “trawling” was the third most common key word mentioned in the interview transcripts, appearing 42 times, nearly always in a negative context.

4.4 Outcomes and shortcomings of local and traditional knowledge mapping

Despite the obstacles this study faced in the way of limitations of time and resources, as well as the inherent challenge of assembling local knowledge that is being systemically erased, this research made notable progress in spatially arranging local and traditional knowledge. As mentioned previously, the task of mapping local and traditional knowledge was an ambitious goal requiring a significant level of trust within the communities of interest. For that reason, only one quarter of the participants of this study were engaged with the mapping component, leading to limited spatial data. This limited data prohibits the study from proving theories on spatial change of marine resource use over time but does begin to bring a picture of local knowledge mapping into focus.

The 6 SeaSketch surveys conducted yielded 44 unique sketches depicting current and historic fishing locations. Additionally, 5 sketches were drawn by participants, mapping areas of hypothetical MPA expansion that they would support. SeaSketch automatically compiled all survey responses into a spreadsheet for analysis. All spatial responses from surveys can be viewed in the Map shown below.



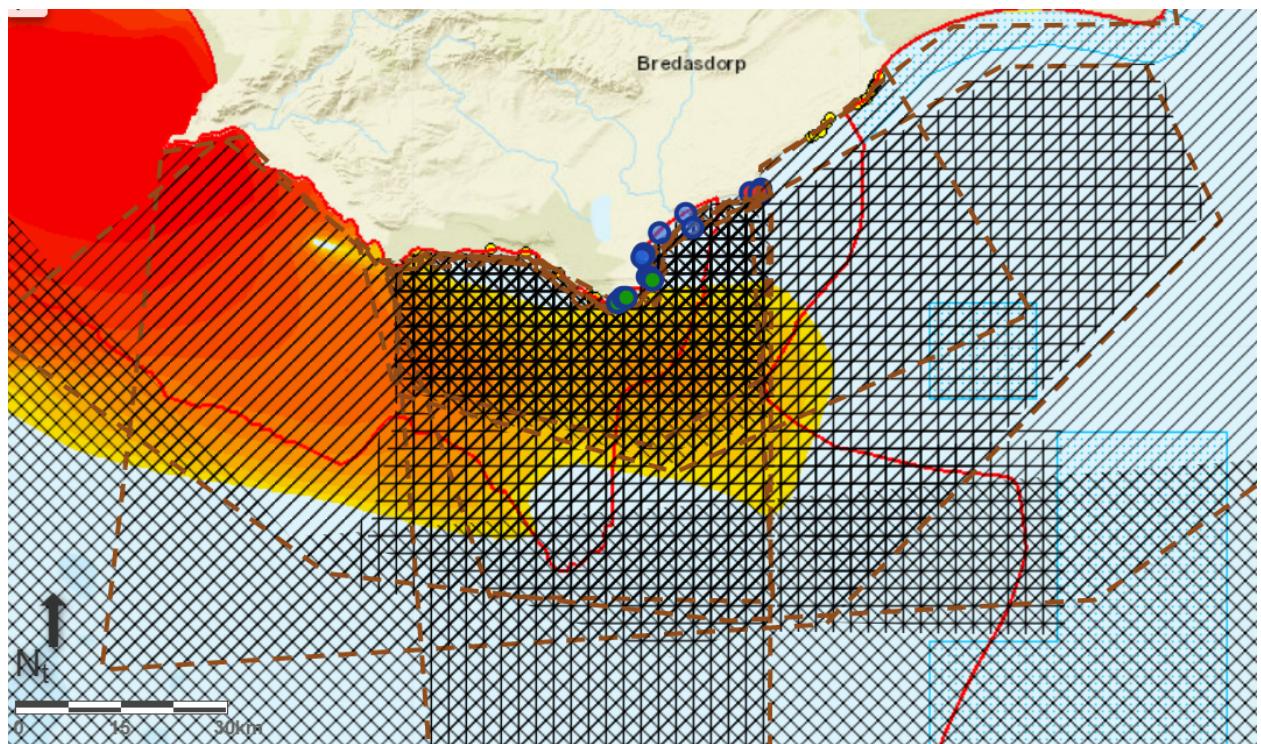
Map 4.1 Shows the raw mapping data in the area of study with the various polygons drawn by fishers to show historic and present fishing grounds as well as hypothetical boundaries for fisher-designed MPAs. Sites of historic fish traps are depicted as red dots (Author).

One of the more significant insights gathered through the SeaSketch mapping process was the identification of historic fish traps and several that are still in active use. 7 sites of historic fish traps were identified and mapped while 6 additional locations of actively used fish traps were also mapped. Several of the fish traps identified in the study have not previously been mapped. Knowledge of fish traps was more frequently held by the older generation of fishers, who were 50 and above, whereas most younger fishers had no memory of using the fish traps and limited knowledge of how they work. One exception to this was a younger fisher (age 26) from the nearby community of Arniston who grew up using the *visvyvers* there and continues to harvest from them when he returns home. He spoke of these traps' value in upholding the resilience of fishers in the area who could harvest as much as 40 kg of fish from them and would use them as a source of food and income on days in which the seas were too rough for boat fishing (MS SB 5, 2022).

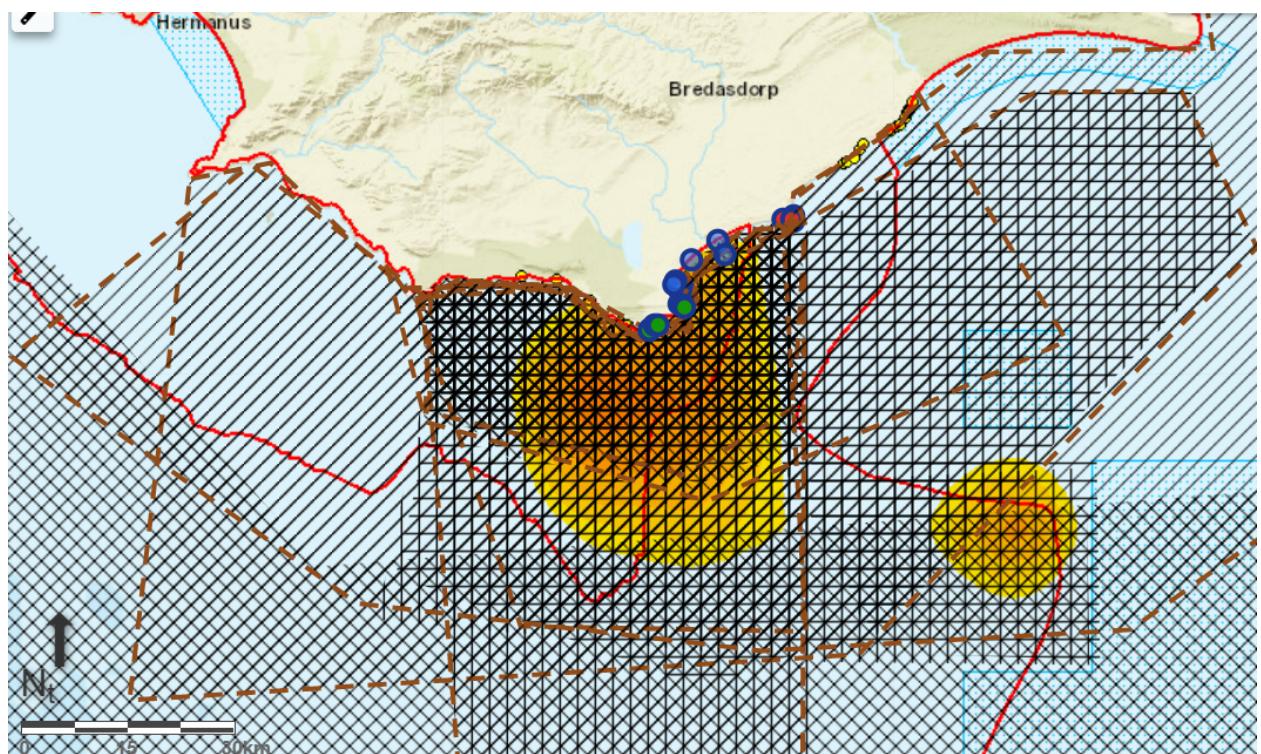
Improving the documentation of *visvyvers* in the area of study and along the South Coast may be important in building a conservation strategy that balances ecological objectives with cultural and livelihood-based outcomes. While the technology has been incorrectly attributed to indigenous people of the area, fish traps have been in use for hundreds of years and comprise a key component of maritime heritage (Hine et al., 2010). Historically, the protection of maritime heritage on the South

Coast has largely centered on shipwrecks, as exhibited by the extensive shipwreck museum in Bredasdorp. The majority of the ships and people lost at sea in this area are people from outside South Africa traveling along the coast. In contrast, it was South Africans who were using the fish traps, the remnants of which are more easily seen from land. Compare as well, the ways in which shipwrecks have received legal protection for decades, whereas fish traps have received far less legal recognition, and have even been actively destroyed by government initiatives, like the construction of tidal swimming pools (National Heritage Resources Act No. 25, 1999). Elevating the status of fish traps could serve as boon for tourism to these interesting archeological sites.

From a marine spatial planning perspective, the spatial data captured in this study represents progress toward identifying potential areas of conflict and charting a plan for resolution. The maps below depict how small-scale fishers in Struisbaai have historically concentrated their effort in areas that attract recreational and trawling fishing effort. This spatial data helps triangulate the qualitative data from interviews where fishers regularly discussed conflict with other fishing sectors. Additionally, the maps help support the claims that fishing policy favors other sectors over SSF. The insufficient depth of data limits the degree to which conclusions can be drawn. No clear trends of spatial changes in fishing effort over time by small-scale fishers can be determined due to the relatively small sample size. Still, the initial findings of this participatory mapping exercise point to the need for increased effort for capturing local and traditional knowledge in spatial formats and ongoing efforts to refine methodology.



Map 4.2 Thatched survey data of current and historic fishing grounds of small-scale fishers from Struisbaai overlaid with the midwater trawl footprint (shown in red-yellow) demonstrates overlapping interest in the area where handliners focus the majority of their effort (Author).



Map 4.3 Thatched survey data of current and historic fishing grounds of small-scale fishers from Struisbaai overlaid with the

recreational fishing footprint (shown in red-yellow) demonstrate concentrated recreational interest in the area where handliners focus the majority of their effort (Author).

4.5 Local observations of environmental change in the Cape Agulhas region

Desktop reviews of literature dedicated to local knowledge of environmental change in the Cape Agulhas region provided a foundational understanding of the state of knowledge on the issue prior to fieldwork. In Parker's (2013) master's research, climate change is identified as the greatest threat facing fishers, with 54% of survey participants citing it as their main concern despite limited scholarship at the time focused on how climate would manifest in the oceanic conditions of the region (Parker, 2013).

Relatedly, other environmental change is discussed, particularly the decline of fish stocks (Parker, 2013). Ismail (2022) uncovered several perceptions of environmental change observed by residents of Buffeljagsbaai, including rougher seas, changes in fish catch assemblages and distribution, and the absence of certain species that had previously been caught in the waters adjacent to the community. The research of Jarre et al. (2017) organizes stressors into three categories; major, mid-range, and minor stressors, based on the number of times they are mentioned by participants. Environmental change was among the major stressors identified, along with policy, regulation, and issues with the inshore trawling sector (Jarre et al., 2017).

Among the 50 South Coast fishers interviewed by Ward et al. (2021) there were many opinions of climate change, but no strong agreement catalogued (Ward et al., 2021). Some participants expressed an awareness of the natural variability of the marine environment that aligns with scientific understandings of decadal variability within EBUS (Ward et al., 2021; Bakun et al., 2015). Despite knowledge of natural variability, there was a belief among several fishers that variance in the system has shifted beyond what could be considered natural oscillation based on living memory (Ward et al., 2021). Changes in wind patterns were seen to be a key climatic variable for fishers, as wind directly impacts when fishers could go to sea and is perceived to drive water temperatures and fish regimes (Ward et al., 2021). Fishers discussed intra-seasonal wind variability including the late 2000s trend of winds becoming more persistently southeasterly – an observation that aligned with scientific observations (Ward et al., 2021). Wind data also indicates changes in wind patterns in the mid-1990s, which aligns with local observations (Ward et al., 2021; Blamey et al., 2015). Ward et al., (2021) also report several mismatches between historic climate data and fishers' observations, including a local belief that wind speeds were intensifying which did not align with scientific data, highlighting the importance of triangulating findings.

The documentation of aligned and mismatched local and scientific knowledge of climate change among fishers in the southern Cape region, adjacent to the geographic scope of this, indicates the value of investigating the subject further in the Cape Agulhas region.

4.5.1 Local knowledge of fishery decline in the Cape Agulhas region

There was widespread consensus among participants of this study that fish catch totals have declined in recent years and a belief that it is being driven by overfishing. The primary driver of overfishing was seen to be the influence of industrial trawlers on the Agulhas bank (FG SB 2, 2022; FG SB 3, 2022, MS SB 1, 2022, MS SB 4, 2022; FG BB 2, 2022; KI K, 2022). The frequency with which trawling was blamed for fish stock declines indicates a local knowledge consensus that aligns with scientific evidence of trawling contributing to forcing and regime changes in the Southern Benguela (Currie, 2017). Participants expressed frustration with the number of fish trawlers caught, the large quotas trawlers received, the habitat destruction they drove, and the lack of regulation they face (KI A, 2022; MS SB6, 2022). There was widespread belief that fishing regulation unfairly favored industrial trawling, allowing for large amounts of bycatch despite the large number of target fish they were able to capture with minimal effort (FG SB 2, 2022). In contrast, participants discussed how small an impact handlining had and the lack of bycatch they were allotted, arguing it would be nominal compared to the trawlers, again reflecting growing understanding by international global science-policy institutions that SSF has greater social benefits and smaller ecological impacts (FG SB 2, 2022; FG BB 1, 2022, FAO, 2015; Sowman and Sunde, 2021; FAO, 2022). Furthermore, participants regularly posited that trawlers were breaking the law without consequence by fishing too close to shore, catching undersized fish, and underreporting their catches. The frustration is summarized by a skipper who was quoted saying, *“Those big trawlers, those big companies, they catch undersized, sometimes more than what their sized fish is. There’s nothing that is done to them. But they threaten the skippers of the boats here: ‘catch you with undersized fish on your boat, we take your license.’”* (FG SB 2, 2022).

The exact details of when and how catches have declined for small-scale fishers was not unanimous; however several trends were revealed in the findings. Earliest estimates of when stocks began declining coincided around the end of apartheid, while others placed it as recently as the last decade (MS SB 3, 2022; MS SB 4; 2022). The average was somewhere in the middle around the year 2000. While most of the blame was put on trawlers, there were many fishers in focus groups who identified the increase in ski boats from Cape Town and the West Coast as a driver as overexploitation (FG BB 2; 2022, FG SB 3, 2022). This was tied to the establishment of the MLRA which divided the South African coast into three

distinct fishing zones that permit holders were restricted to (KI A, 2022). The Cape Agulhas region is the southeastern most edge of Zone A which spans from the mouth of the Orange River on the Namibian border to Cape Infanta 85 kilometers northeast of Struisbaai (KI A, 2022). This zonation was seen by fishers in focus groups and expert interviewees as attracting a high concentration of fishers seeking yellowtail in warmer water who would have otherwise dispersed further afoot without geographic limitations (FG SB 2, 2022; KI A, 2022). Small-scale fishers in the region did not express resentment of the outside fishers who come to their area, but frustration with the policy that is perceived to funnel them into one place. In contrast, Struisbaai ski boat fishers travel to the West Coast to fish for snoek in the winter but range from Port Nolloth to Cape Town.

Another factor seen to be driving fishery decline is the increase in recreational fishers in the Cape Agulhas region. The Agulhas Bank is a very popular sport fishing destination, with Struisbaai functioning as a main hub for tourists. Wealthy, predominantly white, recreational fishers fill the town in the summer months, targeting the same species as handliners, particularly yellowtail (FG SB 1, 2022; MS SB 2; 2022). Participants discussed how recreational fishers drive overfishing and listed a number of other issues with the sector. In addition to competing for dwindling fish, small-scale fishers experience encroachment of their space on land and in the water. In the peak tourist season, it can take hours to launch boats with long queues and recreational fishers failing to yield to those who fish for a living (MS SB 1, 2022; FG BB 1, 2022). On the water, small-scale fishers have attributed boat traffic to scaring off fish and creating dangerous situations. One handliner drowned recently when his rowboat was swamped by a recreational boat creating an irresponsible wake in the harbor (FG SB 1, 2022). The injustice of threats created by recreational fishing in Struisbaai to small-scale fishers is compounded by the fact that recreational boaters who are outcompeting handliners are living in the former neighborhoods of the coloured fishers who were displaced under apartheid.

4.5.2 Local knowledge of climate change in the Cape Agulhas region

The various methods used for these local and traditional knowledge case studies revealed many observations of climate change trends in the region. Interviews and focus groups yielded several discussions on how wind and sea temperature patterns have changed in the years since participants began fishing. Additionally, 100% of survey participants identified changes in both sea and wind patterns (MS SB, 2022). When asked the dates they first began observing such changes, all but one participant named different years for wind and sea temperature changes. Interestingly, despite individualized disassociation between the two phenomena, the average answer for both was 2008 (MS SB, 2022). This

is a key finding as it is local knowledge that closely aligns with scientific findings which have modeled an intensification of wind-driven upwelling in the Southern Benguela and a cooling effect for sea surface temperatures (Ward et al., 2021). Limited scientific research has been dedicated to understanding how climate change is manifesting in the Cape Agulhas region specifically, supporting the importance of these findings (Ismail, 2022). Ward et al. (2021) point to changes in wind patterns in the nearby Southern Cape region in the early 2000s rather than the late 2000s, as identified in the area of study. Still, the relatively similar timeframe between the two and the overlap between them helps provide some validation for this study, though it is acknowledged that more data is needed.

In addition to general changes in climate, this fieldwork uncovered additional traditional climate knowledge. Several different participants mentioned a wind pattern known as the *black southeaster* which is used to indicate the start of the yellowtail season. Typically, strong winds out of the southeast blow for a week in October, and when it subsides, large schools of yellowtail will have arrived off the coast and the season unofficially begins. In recent years, the *black southeaster* was observed to be shorter, sometimes blowing for just a couple of days (FG SB 2, 2022; KI A, 2022). Many fishers expressed a belief that the weakening of the pattern could be connected to decreasing catches. Interestingly, 2021 was marked by a very intense *black southeaster* that blew for nearly a month (MS SB 1, 2022). This initially inspired excitement among fishers who thought it may signal improved fishing. When catches remained low, fishers then speculated that the event lasted too long and was as disruptive to fishing as black southeasters that were too short. To date, there has yet to be a study that assesses changes in the *black southeaster* using local or scientific knowledge. Local and traditional knowledge of increasing climate instability helps highlight the challenges faced by small-scale fishers in the Cape Agulhas region and should be valued accordingly.

Despite the widespread observation of climate change and the belief that it is affecting fishing, participants in this study were adamant that it should not be isolated as the only factor driving fishing decline. Fishers were critical of the way policy makers and researchers seemed to obsess on climate change alone rather than look at the myriad factors undermining their ability to make a living from the sea (FG SB 3, 2022; KI A, 2022). Indeed, there seemed to be a mix of fear and frustration that the challenges fishers face would be reduced to climate issues rather than acknowledging other factors leading to catch decreases such as the impact of trawlers and recreational fishers on stocks (MS SB 1, 2022). While climate change is being driven by global atmospheric concentrations of greenhouse gasses that can only be fully mitigated with global cooperation, other environmental challenges fishers face

could be addressed by shifting national and local policies (IPCC, 2022). With uncertain climate scenarios and the likelihood that emissions will continue to rise, it is imperative that every effort be made to insulate small-scale fishers from the worst of climate change's impacts on marine ecosystems.

4.6 Conclusion

Several key findings have been identified in the above Results chapter. Focus groups, mapping surveys and key informant interviews in Struisbaai and Buffeljagsbaai revealed neglect and marginalization of local and traditional knowledge in the Cape Agulhas region fishing sector. Research uncovered a widespread belief among fishers that their knowledge of minimum fish size has been disregarded by regulators while knowledge of traditional fish traps is in the process of being lost. Threats to LTK are directly connected to the history of marginalization fishers in the region have continued to experience and regularly discussed in this research. Efforts to map LTK posed certain challenges that could further threaten SSFs in the region as spatial decision making is adopted by policy makers. However, mapping exercises also revealed important spatial data, including potential areas of conflict with other sectors and the sites of historical fish traps that are worthy of additional protection. The next chapter will discuss the implications of these findings further.

Chapter 5: Discussion

5.1 Introduction

The three major themes that emerged from the results of this research will be discussed further in this chapter. First, the marginalization of local and traditional knowledge in the governance of the Cape Agulhas region's small-scale fishery will be examined. Additionally, the value of historical context in helping achieve just outcomes in SSF management will be investigated, drawing from local perceptions of ongoing legacies of marginalization. Last, mapping will be assessed as a tool that has the potential to impact governance by including local and traditional knowledge and historical context, or further alienating neglected knowledge types by failing to incorporate it in the spatial decision-making process.

5.2 Marginalized LTK in the Cape Agulhas region's SSF

At a global level, recognition of the importance of local and traditional knowledge inclusion in small-scale fishery governance has become widespread, but this study of the Cape Agulhas region demonstrates how realities on the ground can lag behind policy. Despite the valuation of LTK in policy frameworks like UNESCO, FAO, and IPBES, governance of the Cape Agulhas region SSF fails to adequately include local perspectives (Molarch and Verschuren, 2019; FAO, 2015; Tengo et al., 2017). At the national level, the SSFP mandates stakeholder engagement but local perspectives from SSFs in the region demonstrate this legal requirement has been ignored by the DFFE (FG BB 2, 2022). Despite the challenges caused by the neglect of LTK in fishing policy, SSFs remain adamant that their voices be included in fishery management.

While this research began as a way of investigating how local and traditional knowledge could be incorporated into marine resource policy, it uncovered a lack of political will to do so. Healy et al. (2022) discusses the role of the courts in protecting the legal right for local input in policy making. The courts have increasingly been viewed as an avenue holding the government to account when it fails to meet consultation requirements. Small-scale fishers' knowledge was successfully wielded to block two separate oil exploration projects funded by multinational corporations in 2022 (Heally, 2022; Glazewski and du Toit, 2022). These recent legal victories mirror a legacy of lawsuits that have upheld local input into SSF governance, particularly *George* (2007) which created the legal grounds for the establishment of the SSF policy and *Gongquose* (2018) which upheld customary rights (Sowman and Sunde, 2021; Paterson, 2020). Yet while these cases inspire hope in the South African legal system's capacity to

uphold constitutional rights, the frequent need for legal defense of rights is also discouraging. This is particularly true in the context of the burden of proof, whereby the impetuous for demonstrating LTK falls on those whose rights have been violated. This is particularly burdensome when one considers the many ways the state has stripped the fishing communities of their ability to retain proof throughout South Africa's history.

The limitations of the courts' ability to protect local and traditional knowledge can be seen in the victories experienced by South African fishing communities as well as the defeats captured in this research. In the case of the interdict issued against Searcher's oil exploration on the West Coast, local knowledge of snoek migration helped demonstrate that seismic exploration posed a credible threat to fishing livelihoods (Glazewski and du Toit, 2022). Still, this local perspective would not have been sufficient if not supported by a scientific study that corroborated LTK (Glazewski and du Toit, 2022). In many cases there is an absence of scientific or local knowledge, which makes building a case to protect local communities difficult. This can be seen in Struisbaai, where local knowledge of a coloured burial ground could not even go so far as to garner support from a lawyer to oppose development (MS ST 1, 2022). Additionally, there was evidence of local knowledge on fish traps being lost from the older generation to younger generation in Struisbaai, decreasing the likelihood that traditional rights to use them might be restored (MS SB 3, 2022). While discussions with local communities demonstrate how their knowledge is eroded and ignored, building cases for protecting traditional rights requires an expansion of LTK studies designed to use research to empower communities.

The influence of research in coastal communities has the potential to assist in the recovery of marginalized knowledge, yet it also risks further eroding it. Community members in focus groups, key informant interviews, and mapping surveys regularly expressed concern that their participation in this research would not benefit the community, as past conversations with academics led to no feedback (FG SB 1, 2022; KI A, 2022; MS SB 2, 2022). A focus group discussion revealed signs of research fatigue as some community members discussed being tired of participating in interviews (FG SB 3, 2022). Extractive research is particularly concerning given the way knowledge could benefit the community in which it is held by bolstering the protection of traditions and livelihoods (Parsons et al., 2016; Glazewski and du Toit, 2022). In addition to the evidence of fading knowledge on fish traps, a key informant interview revealed the way historic connection to indigenous Khoisan roots is becoming increasingly hard to understand as older generations die out and their histories fail to be recorded or returned to the community by researchers (KI A, 2022). The preservation of local and traditional knowledge, and the

understanding of the ways it has been imperiled by policies of subversion and neglect, is a crucial research endeavor that must be prioritized.

5.3 Historical context for environmental justice in SSF governance

Several recent studies recognize the importance of historical context as a key component of environmental governance (Kozanayi, 2018; Mbatha, 2021). Focus groups and mapping surveys with small-scale fishers in the Cape Agulhas region repeatedly addressed historical injustices experienced by those working in the sector. Additionally, the history of small-scale fishing – dating back several generations in many fishers' families – provided further context to this LTK study including an understanding on how this history informed the identity of individuals and community members.

Handline fishing has undergone few changes in the Western Cape over the last two centuries, making it a sort of control variable in the context of historical change (Visser, 2015; Isaacs, 2011). The majority of fishers who participated in this study discussed injustices they experienced during apartheid and how it impacted their lives in the SSF sector. Additionally, the democratic era brought new challenges to fishers in the form of regulations made without their consultation.

The history of Struisbaai Noord is tied to community members' connection to marine resources and the strength of those connections throughout history. Focus groups, mapping surveys, and key informant interviews revealed how the younger generation in Struisbaai is less connected to the sea than ever before. Despite few employment opportunities in the area, fewer young people are joining the small-scale fishing sector than ever before. Decades of overfishing, largely driven by industrial fleets, has undercut the viability of small-scale fishing livelihoods. The democratic government's increased use of regulations and permits that fail to incorporate local knowledge has added to fishers' burdens. However, understanding these challenges with a historical lens reveals how modern challenges are the culmination of centuries of oppression that remain in place formally and informally. The difficulties coloured fishers have in finding a fair price from *langanas* today echoes their position as price takers to the white captains and owners under apartheid and the difficulty traditional fish trap users had in exchanging their catches for anything but alcohol in the colonial era (FG SB 3, 2022, MS SB 3, 2022, KI A, 2022). Similarly, the lack of consultation on fishing policy today echoes government planners' and engineers' failure to listen to local knowledge when building the harbor around the middle of the twentieth century (FG SB 1, 2022). Fishers tried to tell them about the currents and how the harbor wall would make it fill with sand; however, their advice was ignored leading to costly dredging requirements, degradation of nearshore fishing grounds, and stranded boats (FG SB 1, 2022). And while the Group

Areas Act has long been abolished, the spatial legacy of apartheid continues to affect fishers who remain in subpar housing far from sea and who are threatened by a marine spatial planning policy that makes little consideration of righting past wrongs.

In Buffeljagsbaai, the consequences of years of poor marine resource governance and historical injustices were seen to affect nearly every aspect of the community where marine resources harvesting supports the majority of households. Community members identified the cascading impacts of historic policy; they blame decline of handline fishing on government policy that favored industrial trawlers under apartheid and into the democratic era (FG BB 1, 2022; FG BB 2, 2022; KI K, 2022). The decreased viability of handlining is seen as a reason many people resort to abalone poaching, risking fines, jailtime, and safety to maintain an income (FG BB 1, 2022; FG BB 2, 2022; KI K, 2022). The imbalance of the policy is embodied in the militarized, criminalization of abalone poachers versus trawlers who are viewed as free to fish illegally with impunity (FG BB 2, 2022). It is further theorized that the government has shown no incentive to stop this historic cycle as they garner revenue from the sale of seized abalone, motivating them to exacerbate the root of the problem so they can benefit from the symptoms (KI K, 2022). In a cruel twist of poetic irony, a Buffeljagsbaai discussion on the ongoing marginalization of the community was interrupted by the sound of helicopters sent to the community to arrest poachers. This was described by a key informant in the community as the continuation of policy that criminalized the livelihoods of poor, coloured marine resource users for the appeasement of wealthy, white conservationists who regularly report on poachers to authorities (KI K, 2022). As the marine ecosystems of the Cape Agulhas region become set for further conservation-based management through the EBSA process and UNESCO recognition, it is important that new policies account for the ways conservation has historically been a source of injustice in the area and throughout South Africa as a whole.

5.4 Mapping marginalized knowledge for improved SSF governance

As global policy initiatives and South Africa legislation increasingly embraces the role of mapping in marine resource governance, it is critical that spatial tools be assessed for how they may include or further marginalize LTK. Failing to consider historical injustices in the marine spatial planning process will entrench power dynamics and potentially lead to undesirable social and ecological outcomes (Lombard et al., 2019). To date, South Africa's MSP Act makes insufficient consideration of how to be inclusive of marginalized knowledge and how the process can be used as a tool for restitution (Republic of South Africa, 2018). The failure of the government to deliver policy that protects traditional fishers may seem like a passive act of neglect; however, negligence is a form of slow violence that mirrors the

outright violence of apartheid (Nixon, 2011; Healy, 2022). Expressing the danger of policy on small-scale fishers, one participant stated, “*With all their laws... especially the fisherman, they're trying to kill him.*” (FG SB 2, 2022). Instead, policy, including the MSP Act, must be deliberate in reversing the harm caused by past interventions.

Understanding the degree to which policy is applied is of even greater importance than the content of what has been legislated. While the new MSP Policy in South Africa fails to adequately outline sound strategy for including the knowledge of fishers, there is little evidence to suggest that improved policy and legislation would have a meaningful impact. Throughout the democratic era, LTK of fishing communities has been undermined more by the failures of political will than policy. Ample legal protection is in place to protect SSFs rights to consultation and access to marine resources as it is enshrined in the Constitution and SSF Policy (SA Constitution, 1996; SSF Policy 2012). Yet the existence of these rights on paper does not guarantee their reality on the ground where conflicting neoliberal imperatives undermine their application and prevent the redistribution of power and access that was systematically eroded under apartheid and colonization. Accordingly, iSimangaliso UNESCO Site was established with sound policy that called for local decision making and benefit sharing in its founding charter, in line with South Africa’s World Heritage Convention Act, which calls for the use of cultural and natural heritage for the benefit of local communities and the prioritization of access for marginalized groups (Mbatha, 2018). However, the reality of how power distribution has manifested is a perversion of the expressed goals of local benefit, with the conservation area instead further undermining local livelihoods, eroding LTK, and exacerbating poverty. The ongoing of SSFs throughout South Africa since the establishment of iSimangaliso WHS suggests a high probability that UNESCO designation in the Cape Agulhas region would likely have similarly poor social justice outcomes.

Recognizing increasing government focus on marine areas through policies like Operation Phakisa and the MSP Act, it is critical that mapping be deployed to achieve more just outcomes. To date, there is an imbalance in spatially arranged data, with economic and ecological information being more prevalent and easily mapped than cultural data (Holness et al., 2022; Tengo et al., 2014). Remedyng this imbalance will require a shift in policy but also the embrace of new research agendas that expand the breadth and depth of studies dedicated to capturing LTK spatially. This research has demonstrated that there are emerging tools available to researchers motivated by this initiative, but also demonstrates that methodologies need to be improved and refined. The Cape Agulhas region, in particular, warrants further research oriented at assembling spatial social data, as it is an area of high contestation that has

been earmarked for further management interventions by way of its EBSA designation and potential to become a UNESCO World Heritage Site (SoGH, 2020; Harris et al., 2022; Forests of the Sea, 2022). These directives are both a source of hope and alarm as they could be used to further undermine the local and traditional knowledge of SSFs in the region, or as avenues of improved governance (Caust and Vecco, 2017). Both EBSAs and UNESCO are reliant on mapping to influence management, thus it is critical that marginalized knowledge be mapped and included in the conversation.

The challenges and injustices being faced by handliners in the Cape Agulhas region reflect many of the realities faced by SSFs in South Africa and throughout the Global South. International bodies like IPBES, CBD and the FAO recognize the ongoing failure to include local and traditional knowledge of SSFs and the corresponding negative impacts on wellbeing (Tengo et al, 2017). Additionally, IYAFAs calls for improved stakeholder engagement to alleviate hardship in the sector (FAO, 2022). Poverty is widespread among SSFs in the Global South, in large part due to governance failures and lack of political will to achieve just and sustainable outcomes in these complex socio-ecological systems (Jentoft et al., 2018; Carbonetti et al. 2014). The global push for adopting marine spatial planning strategies is seen to have the potential to reduce conflict and alleviate injustice (Noble et al., 2019; da Silva et al., 2021). Yet without restitutive approaches to mapping that consider historic injustices and imbalances of power between different knowledge types, outcomes will likely mirror those of the past. Given the importance of small-scale fisheries in bulwarking the resilience of vulnerable communities, it is critical that those who help draw new maps are those who were excluded in the past.

Chapter 6: Conclusion

This study assembled local and traditional knowledge of handline fishers in Struisbaai and Buffeljagsbaai with a focus on understanding the impact of historic injustices in shaping current realities in the Cape Agulhas region's small-scale fishery. In trialing new approaches to assembling findings spatially, the work highlighted the significance of mapping local and traditional knowledge in small-scale fisheries' governance. Motivated by a desire to contribute to understandings of resiliency in the communities of study, this research chronicled local knowledge about fisheries' ecosystems and climate change held by small-scale fishers in the Struisbaai and Buffeljagsbaai. Meta-level and national policies relevant to the Cape Agulhas region's SSF were identified and evaluated to assess the impact of governance frameworks on coastal livelihoods and how they affect future outcomes in these complex social-ecological systems. Meanwhile, current realities were contextualized within historic framings so as to inform shortcomings of justice and restitution.

The study revealed the way small-scale fishers are threatened in the Cape Agulhas region. In the democratic era, local and traditional knowledge has been ignored and undermined by a government that has favored neoliberal fishing policy. While handline fishing has gone unchanged for generations, many in the communities of study expressed doubt about its future longevity if undesirable political and environmental trends are to continue. Decades of oppression has led to a low adaptive capacity among SSFs in the region, which will make them susceptible to the changing climate and ecosystem instability they have consistently observed in their time spent at sea. Fishers reiterated the sentiment that they were not opposed to regulation in principle but opposed policy that was written and applied without their consultation. Instead, community members addressed ways in which they felt policy could be improved, drawing on local and traditional knowledge to improve the health of ecosystems and the viability of the livelihoods they cherish. As the Cape Agulhas region draws interest in new management strategies through its potential UNESCO and EBSA designation, it is critical that fishers are not only involved in the conversation but at the helm of planning.

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