Technologies, Knowledges, and Capital: Towards a Political Ecology of the Hake Trawl Fishery Walvis Bay, Namibia

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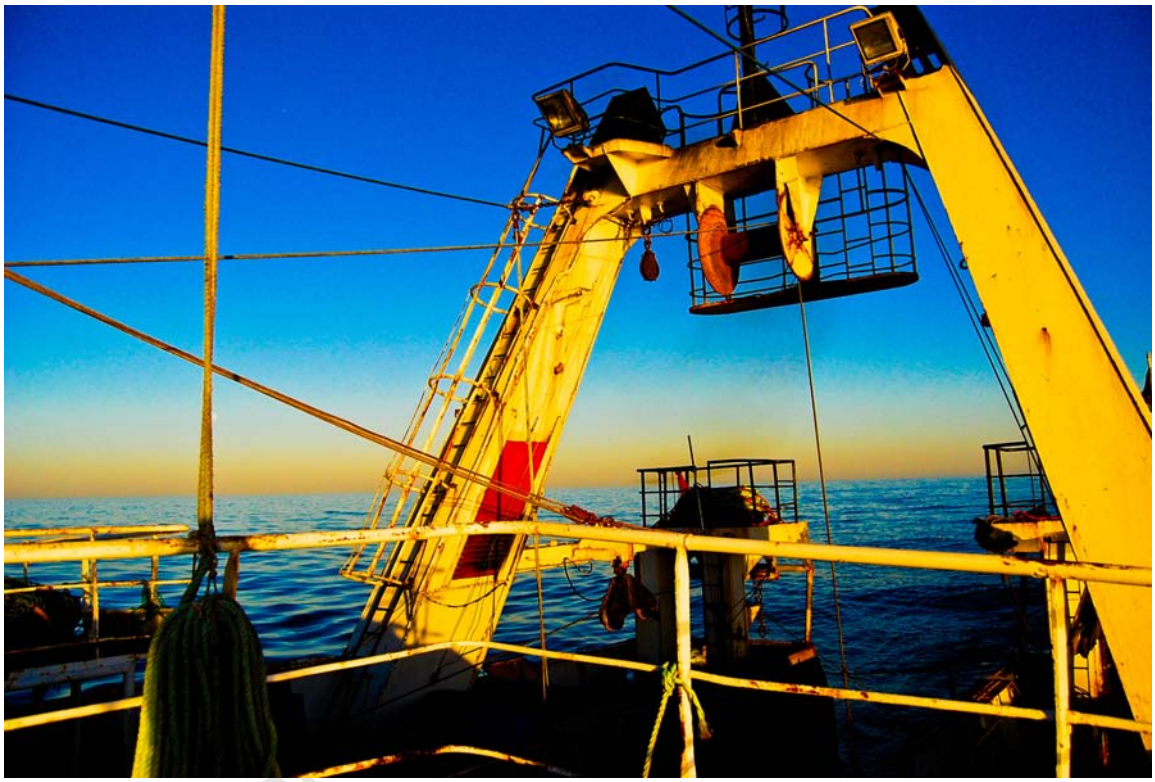

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COMPULSORY DECLARATION

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works, of other people has been attributed, and has been cited and referenced.

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Abstract

Around the world, the implementation of effective fisheries management has been met with a variety of challenges. The incorporation of fisher's local ecological knowledge (FK) into the management paradigm is an important step in understanding perceptions and responses to the changing environment, and emerges as an indispensable component in the dialogue between trans-disciplinary coastal ecology studies. This dissertation seeks to contribute to the integration of these knowledges, and emphasises the involvement of fishers, communities, and research in informing policy. In the context of the hake trawl fishery in Walvis Bay, Namibia, implementation of an Ecosystems Approach to Fisheries Management (EAF) has been difficult, with many of its goals still unmet. This ethnographic project requires a close examination of the interface of local knowledge, state science, and policy. Through conversations, observations, and experiences in the sector, I attempt to broaden access to knowledge, information, and understanding, offering a detailed analysis of the network of interactions that shape the fishery today. This study is unique in that it offers detailed description of experiences at sea and how fishers navigate the complexities of technologies, capital, markets, and an emergent Namibian fishing culture. This research centred on three different fishing trips with the same vessel, spending just over two weeks at sea as well as engaging with company managers and shareholders in order to fully understand the role of the sector in Namibia and at large. Focusing specifically on ground level activities of the trawl sector, this project attempts to assist in greater access for fishers, scientific researchers, and government officials to a network of knowledges, information, and dialogue. This research speaks to the advantages of ethnography in a space salient in scientific research, and offers analysis where previous research has been unfulfilled. Through the integration of multiple forms of research a more comprehensive understanding of the fishery emerges and provides a means to inform policy at the local, national, and global levels. This intellectual project attempts to show the interconnectedness of knowledge discourse, and it is my hope that it will illuminate how ethnographic research in the hake trawl sector will be useful in contributing to the conversations and challenges in social-ecological restructuring.

Keywords: EAF, fishers local ecological knowledge (FK), technologies, political ecology, ethnography, policy, global harvesting knowledge (GHK), actor-network theory

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Contents

Abbreviations

BCC – Benguela Current Commission

CUS – Coasts Under Stress Research Project

EAF – Ecosystems Approach to Fisheries Management

EEZ – Exclusive Economic Zone

EU – European Union

FAO – Food and Agriculture Organisation of the United Nations

GDP – Gross Domestic Product

GHK – global harvesting knowledge

LEK – local ecological knowledge

LME – Large Marine Ecosystem

MFMR – Ministry of Fisheries and Marine Resources

MPA – Marine Protected Area

MSC – Marine Stewardship Council

NGO – Non governmental organisation

SACU – Southern Africa Customs Unit

TAC – total allowable catch

WTO – World Trade Organisation

WWF – World Wildlife Fund

Glossary of Fishing Terms

Assessment Level: Categories of the level of complexity of, and data available for each assessment: index of abundance (INDEX), yield-per-recruit analysis (YIELD), analysis of the age structure of the catch (AGE STRUCTURE), analysis including the relationship between recruitment and spawning stock size (SPAWNING STOCK) and assessment that allows prediction of future (one or two years ahead) stock sizes and catches (predictive).

Biomass: Measure of the quantity, usually by weight in pounds or metric tons (2,205 pounds = 1 metric ton), of a stock at a given time.

Catchability: The fraction of a fish stock which is caught by a defined unit of the fishing effort.

Pelagic: Fish that spend most of their life swimming in the water column as opposed to resting on the bottom are known as pelagic species.

Pieces: Individual items, as in the expression "two dollars a piece" . Individual fish.

Quota: A portion of a total allowable catch (TAC) allocated to an operating unit, such as a vessel class or size or a country.

Rate Of Exploitation: The fraction, by number, of the fish in a population at a given time, which is caught and killed by man during the year immediately following . The term may also be applied to separate parts of the stock distinguished by size, sex, etc. Also called: *fishing coefficient .

Relative Abundance: An estimate of actual or absolute abundance; usually stated as some kind of index; for example, as bottom trawl survey stratified mean catch per tow.

Stock: A part of a fish population usually with a particular migration pattern, specific spawning grounds, and subject to a distinct fishery. A fish stock may be treated as a total or a spawning stock. Total stock refers to both juveniles and adults, either in numbers or by weight, while spawning stock refers to the numbers or weight of individuals which are old enough to reproduce.

Success (of fishing): Catch per unit of effort.

TAC: Total allowable catch is the total regulated catch from a stock in a given time period, usually a year.

Source: http://www.nefsc.noaa.gov/techniques/tech_terms.html#bio

Introduction

Fisheries research is a growing area of scholarship for a variety of reasons. Issues of climate change, natural resource management, conservation practices, sustainable development, and socio-ecological health are real concerns in today's rapidly changing world. While research sites across the globe continue to highlight the global fisheries crises, Namibia's fisheries continue to receive more attention from fisheries scholars exemplifying the Namibian example as a success. This thesis attempts to provide an ethnographic account of the hake trawl sector in Walvis Bay, Namibia. Through this analysis, the research captures the transformation of capital and technologies, carefully considering the influences of globalisation and foreign markets. Additionally, the dissertation seeks to provide a critical analysis of the implementation of the Ecosystems Approach to Fisheries Management (EAF), specifically looking at the policies of Namibianisation. While these policies have garnered promising results in terms of encouraging the involvement of Namibians in the industry, the policy would benefit from ongoing evaluation and strategising, and as such, address emerging issues within the sector as they unfold. The intellectual project of this research situates itself within the current debates in scholarship on political ecology and the interstices of nature, culture, society, technologies, and knowledge through a post-modernist lens. The research aims to contribute to the growing literature on Namibian fisheries, utilising ethnographic methods to engage with the fishing community of Walvis Bay.

Background to Walvis Bay, Namibia: History and Local Economy

Walvis Bay is situated strategically half way down the coast of Namibia, about four hundred kilometres west of the capital city Windhoek. The port here is Namibia's largest commercial port and handles around five million tonnes of cargo and three thousand vessel calls per year (Namport 2009). With direct access to principal shipping routes, Walvis Bay is a natural gateway for international trade, and buzzes with activity year round. It is a sheltered deepwater harbour benefiting from a temperate climate, with little precipitation and temperatures between five and twenty degrees Celsius (Namport 2009).

Namibia's fishing industry contributes significantly to the country's economy and all fishing companies have a presence in the port. According to Robin Sherbourne, a private consultant in economic analysis conducting research in 2007, the

> latest available figures suggest value added from fishing and fish processing amounted to N$2,382 million in 2005 leading to exports worth N$3,687 million, some 20% of Namibia's total exports of goods and services, and direct employment of over 12,000 people. However, many of the highest expectations for the industry in the early post-Independence years have not been fulfilled. The fishing sector's economic contribution has stagnated as stocks have failed to match those early ambitions while other factors such as fuel prices and the exchange rate have also taken their toll. The question is whether policies to promote the holy grail of greater value addition can inject new dynamism into an industry that is fragmented, secretive and politicised, yet at the same time dominated by foreign players with their own marketing and distribution arrangements and almost no separate Namibian identity in key markets (2007:3).

This analysis highlights the revenue generated through fishing and fish processing, as well as the success in re-structuring the Namibian fishing policies. Sherbourne's analysis also points to areas where the expectations of the state in overcoming the turbulent past have been unmet. The pressure of global markets, the rising costs of operations, and disconnects in policy implementation reveal complexities within the industry and requires examination.

Namibia's fishing industry is based mainly on its 1,500 kilometre coastline, which has exceptionally high biological productivity thanks to the upwelling of nutrients arising from the Benguela Current. The northern Benguela ecosystem is bound by the Angolan ocean current in the north, which is considered to form part of the Angolan ecosystem, and extends to south of the Luderitz upwelling center. The Benguela ecosystem spans approximately 179,000 km. It is an eastern boundary current large marine ecosystem (LME), and forms the eastern boundary of the South Atlantic intercontinental ocean current (Heymans et al 2004). The Benguela Current flows north along the west coast of South Africa and Namibia and in the south it meets the warmer Aghulhas Current flowing east from the Indian Ocean while in the north it interacts with the warmer Angolan current flowing south. The meeting of the warm and cold currents produces rich, diverse upwellings that are ideal for many populations of fish, seabirds, and marine mammals (WWF 2010).

The history of the Walvis Bay fishery is a turbulent one, marked by several decades of foreign interest and control from Spain and South Africa. Although Independence in 1990 was a

significant step in Namibian autonomy, the impact of South Africa's apartheid regime and Spain's interest in the natural resources, continue to echo within the country and are visible within the management and policy implementation in the nation's fisheries. Many individuals working in the industry today have South African or Spanish roots, and there are a number of companies with Spanish ownership. Apartheid policies racialised control over natural resources and social inequalities and access to resources were severely asymmetrical, favouring white South Africans and Europeans. In 1990, on the eve of Independence, it is estimated that over one hundred vessels were fishing illegally in Namibian waters, the majority from Spain and South Africa (Meyn 2005). The control of the fishing grounds by foreign fleets also contributed to the racial tensions of those working within the industry. Prior to Independence, Spanish fleets held the majority of control of the fishing practices, therefore most officers were white. At the time of Independence there was minimal onshore processing compared to the increase of these activities today. Racial delineations continue to resonate within the fishery's power dynamics as many of the officers and managers are white, the crews are a mix of coloured and black, and the onshore employment is black. These racial categorisations within the sector further demonstrate the fallacy of a reconciled history. Travelling from Walvis Bay to Swakopmund, a small bridge marks the municipal districts where during apartheid, identity documentation had been required to pass through, exemplifying spatial boundaries that obstructed Namibian's access to fishing grounds. Environmental historian Lance Van Sittert makes the case that "apartheid further exacerbated questions of state legitimacy and economic equity on the marine commons and bequeathed the new post-1994 government the daunting challenge of re-legitimising the state and appeasing the popular demand for redistribution within a market framework," (2003:200).

In Walvis Bay, the municipality remained an enclave under South African jurisdiction for another four years after Independence as South Africa continued to capitalise on the benefits of the port and marine resources, only fully becoming Namibian in 1994 at the end of apartheid in South Africa. Foreign influences, particularly from Spain remain a visible force within the industry, shaping and transforming the sector in complex ways, as there are many Spanish owned companies and fleets operating in the industry. The potential of the Namibian fishing industry reflects "favourable exchange rate[s], the [predicted] collapse of Argentinean hake resources that resulted in a strong demand and good prices in Europe, [thus] Namibia ranks among the top ten fishing countries in terms of the value of production," (Erastus 2002:4). Prior to Namibian Independence in 1990 and the

incorporation of Walvis Bay in 1994, the increase in offshore fishing fleets coupled with processing abroad resulted in little benefits for local Namibian industries. Foreign fleets were able to maximise profits and access to the resources due to the unstable legislative infrastructure. The institution of "Namibia's 200 nautical mile Exclusive Economic Zone (EEZ)'s commercial biomass," was aimed at protecting "valuable species such as pilchard, anchovy, hake, lobsters, orange roughy, alfonsino and oreo dories," (Erastus 2002:3). This also allowed for more control of exploitation and formal regulations. Today, the Ministry of Fisheries and Marine Resources (MFMR) oversees the commercial exploitation of Namibia's fisheries and marine resources, which is carried out in accordance with three White Papers and several pieces of legislation (Sherbourne 2007). Prior to Independence, there is minimal documentation as to the operations of the fishery as there was no concrete management or legislation in place. Only after Independence were fish stock assessments conducted, and the socio-economic impacts are still being addressed within current research. As a relatively new area of focus for fisheries research, this dissertation highlights the necessity to continue examining the Walvis Bay fishery to contribute to the discourse on global fisheries management.

The fishing sector is capital intensive, and "figures from the National Accounts suggest that the industry is investing significantly more in fixed assets than in the early years after Independence reflecting perhaps the greater certainty associated with the policy framework, the need to renew vessels and the investment in onshore processing facilities," (Sherbourne 2007:21). Investment strategies may link to interests in tax evasions from foreign fleets as they invest in more vessels, factories, and capital that contribute to the industry but do not require taxation. Economic and political manouevering reflect strategic interplay of transparent accountability and policy compliance. The capacity for Namibia to utilise effective management practices within the fishing industry reflects a bustling enterprise that continues to engage at the local and global levels in order to manage Namibia's marine resources. The state's obligation to utilise the country's resources "for the optimal social and economic development of all Namibians" is clearly stated in the constitution (WhitePaper 2004). Thus, the MFMR has revised the 1992 Fisheries Act and spearheaded the campaign to attract investment to the industry, echoing the expectation that the fisheries industry will continue to grow, and that its contribution to the national economy will increase, particularly in terms of investment, export growth and employment creation.

Today, much of the foreign involvement in the hake-fishing sector is in the offshore freezer vessel fleets as these comprise the largest fishing companies and costs of operations are high due to the expensive vessels (Erastus 2002). For these fleets, essentially everything from catching, processing and packaging is done on board on trip lengths of up to three months and veils the presence of foreign involvement in the land based operations and fishing industry as a whole. However, it is not as much about direct visibility as transparent accounting that reflects strategic economic and political manoeuvring. Additionally, fisheries policies are geared toward raising revenue for Government. In addition to the standard corporate tax, levied at 35%, the fishing industry has to pay four additional fees and levies. Rights holders pay an annual fee in proportion to the quota allocated, a charge per tonne of fish landed is payable into the Marine Resources fund, by-catch fees are payable per tonne of fish landed other than the species for which the operator holds a right, and licence fees are charged for vessels and factories. These fees and levies are collected by the MFMR and transferred to the State Revenue Fund with the exception of the Marine Resources Fund levy, which is allocated directly to fisheries research, development and training (Sherbourne 2007).

Given the history of the fishing industry in Walvis Bay, the current state of the fishery faces complex challenges in management. These challenges arise in areas of commercial exploitation, the rise of industrial technologies, spaces of capital, and the continued establishment of Namibia in the global arena. Since the fishery operates at the commercial level, management confronts difficulties in allocating quotas, encouraging Namibian citizens into the industry, and securing revenue for the country. Additionally, consideration of the decline of fish stocks and maintaining a prosperous fishing ground factor into the intricacies of successful policy as this indicates holistic, sustainable policy geared to specifically benefit Namibian citizens. Recent fisheries management scholars (Armstrong, Sumaila, Erastus & Msiska 2004) have analysed the benefits and costs emerging from the innovative Namibianisation policies. The scholars argue the main benefits of this policy are an increase in Namibian ownership and employment, while there are losses in reduced quota tax revenues. The Namibianisation policy is viewed as a success and may offer lessons worth following for those countries whose fisheries are still exploited by foreign fishing fleets. However, in stride with the dynamics of a changing and dynamic industry, policies such as Namibianisation require careful evaluation at regular intervals to address areas of concern, strategies for further sustainability within the sector, and offer an expository template for the future of fisheries management.

Global Fisheries Crises: Cautions and Implications for Namibia

Around the world the repercussions of rapid extraction results in the overall decline of fish stocks. As seen in the collapses of the Canadian cod (1992), Peruvian anchovy fisheries (1970s), and the precarious state of the Argentinean hake fishery, the ocean's resources are not boundless and severe consequences occur in the absence of informed decision making at the local, national and global levels. Particularly in the commercial sector, the harvesting and capitalisation of the ocean's resources requires careful navigation as the threat of depletion and collapse are a looming reality. Due to the scale of operations in the Namibian hake sector, and the role it has in the global market, there is a salience within the industry, domestic life and the marine ecology itself. The emergent network and complexity of local and global interconnections poses challenges for fishers, marine scientists, government officials and coastal communities, as there is no sure answer as to the way forward. For fisheries management, incorporation of research and knowledge from diverse backgrounds allows for integration of humans, natures, markets and technologies, thus contributing to the challenging interface of governance of the oceans' resources. As Gisli Palsson (2006) discusses, the shift from localised fishing and localised fishing knowledges toward global harvesting knowledge reflects how commercialisation has shifted the locus of power from labour to capital in the fishing industry. Therefore, the implications of industrial technologies in the fishing industry as well as the role of localised fishing knowledges in management and sustainability initiatives are of interest to future management policy and implementation. In the Namibian context, measures have been established in terms of implementing policy that are inclusive of social elements and specific goals of human well being. This is a first step in recognising the implications of the fishery in many sectors of life that affects not only the industry but also the country and its citizens. These policies resonate with the global shift towards an Ecosystems Approach to Fisheries Management (EAF) (FAO 2003). Central to the implementation of EAF "is the concept that people, in this context those engaged in the fishing industry, do not operate outside of natural systems. If we hope to invoke the wise management of our oceans, the sustainability of people's livelihoods needs to be considered, along with the broader impact of fisheries management decisions on fishing communities," (Paterson & Petersen 2010:282). Although EAF demonstrates a shift from prior measures of management policies that relied significantly on scientific knowledge and expertise, "the practical implementation of EAF principles in fisheries management protocols has proved more difficult to achieve. In particular, there

has been little progress globally towards developing simple and structured guidelines for implementing an EAF within fisheries management organisations," (Paterson & Petersen 2010:276). Thus, the emergence of Namibia on the global scale and the continuation of effectively negotiating global economics and industrial production have been met with complex challenges in policy implementation. The role of fisher's knowledge and experiences becomes ever more integral in confronting the asymmetries in policy that have focused on single species, certainty, and expert control (Palsson 2006).

The Hake Sub-Sector: Description of Fishery and Bottom-Trawling Techniques

This research focuses on the hake sub-sector, specifically the bottom trawling industry. Trawling is the main means of fishing for hake in Namibia and is also under much scrutiny due to the way in which it affects the ocean environment. Hake remains the most desired product for fishing companies, as the demands in Spain, South Africa and the United States are consistently strong. Trawling requires capital-intensive technologies and expert skills from a knowledgeable skipper and crew. These components contribute to a dynamic and contentious fishing practice, and exemplify the contestations over fishers' local knowledge, the role of technology at the industrial level, and perceptions of capital, all of which inform policy. Bottom trawling is a style of fishing that involves "the exploitation of species that live near or on the bottom of the sea. These are predominantly hake but include significant and growing quantities of monk and sole, which are targeted by monk right holders but also caught in significant quantities as a by-catch by hake bottom trawlers. The hake season runs from May to April. Demersal hake can either be frozen on board or landed wet for processing on shore and possibly for transport on ice by air to consumers," (Sherbourne 2007:13).

In the trawling sector, the vessels are steel and around thirty to forty metres long. Crews consist of around twenty to thirty individuals. On the Harvest Nicola, the skipper was white Namibian, the first mates were black Namibians, the bosun was a coloured Namibian (Spanish/Namibian) and the deckhands were all black Namibians. The racial dynamics here parallel the historical trajectory of Namibia, in particular colonisation in the late 19th and early 20th century, and in regards to fishing practices, the exploitation of foreign fleets leading up to Independence (Sumaila 2004). Many of the individuals I spoke with, crew members, officers, fleet managers, administrative officers, and engineers were Namibian but had come from other areas of the country

for work. Many came from the northern areas of the country, Windhoek, or from the south. The prospects for employment in the fishing industry highlight the emphasis on Namibianisation policies. On the Harvest Nicola, the importance of a cohesive crew became apparent to me as I observed the process of trawling.

Trawling itself involves 'shooting' the net wherein hundreds of metres of net are released into the water via cables connected to trawl doors weighing over a tonne each, and the net is then dragged along the bottom of the ocean for periods of up to four hours. The length of the trawl is determined by the skipper and is based on a variety of factors including previous trawls in the area, type of hake desired (quality, size, species), and weather. Sometimes a test trawl will be done where the net is dragged for an hour and then picked up to check the size and quality of the fish. If the skipper is satisfied with the test trawl results, they will commence fishing in that area otherwise they will steam to a different fishing ground. Along with the nets, trawl doors, cables and vessel there are a variety of other devices that the skipper uses while trawling. The echo sounder indicates the presence (or absence) of fish in the water, emitting an echo that is translated into a signal on the computer screen in the bridge. The Global Positioning System (GPS) indicates the coordinates of the vessel at any given time. These coordinates are recorded with each shoot and pickup of the net. The skipper often relies on previous coordinates to help determine where he will fish on each trip. Each vessel is equipped with a radio that is usually set to the company's channel, but the skipper can switch channels and communicate with other vessels in the area. A satellite phone is installed on the vessel in case of emergency or when signal is lost on the general radio, and although there is a computer with an internet connection, in my experience communication via computer/internet is rarely used. Each vessel's setup is slightly different but in general, the skipper and first mate have single cabins on the bridge, the main deck has cabins for the bosun, cook, fisheries observers and remaining officers while the lower deck houses the deckhands, factory crew, and engineers. The factory on board is below deck, and the engine room is at the very bottom of the vessel. Depending on the vessel, cabins will have one or two sets of bunk beds, and in some cases, one large cabin will have bunk beds stacked three high. The kitchen and dining area are located on the main deck, and there are separates eating areas for the crewmembers and the officers.

Current Debates in Scholarship: Natures-Cultures in Postmodernity

This research takes a lead from recent scholarship that has begun to address how rethinking the integration of knowledges reflects a shift in the approach to science studies and the production and use of knowledge. This paradigmatic shift proposes an alternative way of conceptualising the importance of social processes in the production of knowledge, the presence of multiple forms of knowledge, and how disciplinary boundaries may be crossed in order to engage in constructive dialogue within scholarship and practice. In particular, the work of Bruno Latour has been stimulating the intellectual project of challenging the bounded categories and dualisms emerging from the 'modern' era. In Latour's work the notions of 'modernity' are implicit in the related characteristics of "the dualism of nature and society, the notion of objective science, and the assumption of linear control," (Palsson 2006: 72). Ecological anthropology poses a framework of symmetry, free of bounded dualisms and diplomatic implementation of what Latour terms 'cosmopolitics.' Latour explores the illusions of modernity, used to expand and enforce the rationale of the nature/culture divide. A cosmopolitical approach proposes to explore an alternative engagement with reality of nature as province of science via an expanded realism. Thus, an understanding of the material reality of objects and the multiple ways in which they contribute to and mediate multiple natures emerges. A cosmopolitics, Latour proposes, moves beyond the nature/culture divide and "it must embrace, literally, everything—including all the vast numbers of nonhuman entities making humans act," (Latour 2004:454). Thus, rather than rigidly constructed categories of society, nature, science, culture, these components are part of an interlinked network or assemblage. There are multiple ways of knowing, being in, and engaging with the world we inhabit, that are not limited to human interaction. For environmental issues, the post-modern critique has enriched the anthropological dialogue in "drawing attention to relations of power, to Western anthropocentrism, to the problems with dualism, and to the inadequacies of the correspondence or mirror-of-nature theory of truth and of the grand narratives of modern science on progress and control," (Palsson 2006:75). However, this is not to take an entirely constructivist approach that risks categorising environmental crises as solely a social construct. As Marianne Lien and John Law note, an alternative to constructivism is more radically performative where social structures are being simultaneously generated alongside scientific and other forms of classification or knowledge (Lien & Law 2010). Therefore, the social, the natural, and ensuing classifications are being enacted together in material practices, echoing a symmetrical approach to the formation and understanding of knowledge addresses the constellation of action through many threads of interconnectedness. The interconnectedness, or the meshwork of interactions draws from recent debates in scholarship around

science and technology studies, actor-network theories, and post-modernist critiques of dualistic modes of thought. Rather than seeking an either/or paradigm to describe knowledge, experience, capital and technologies, a meshwork of interactions looks specifically at the processes that allow for various perceptions and responses within the sector. It is not possible to isolate a single process or interaction, therefore to engage with the meshwork and recognise the nuances that contribute to the greater structures in place, assists in expanding our understanding of the fishery and as such, contributes to strategies for fisheries management. In the hake trawl sector, semiotics can be coupled with political ecology in the analysis and refers to the interpretation and utilisation of signs, signals and indicators that emanate from various sources.

Disentangling ideology from the absolutism of Science as a governing category demonstrates one of the fallacies of modernity, as this paradigm still distinguishes starkly between cultures and Nature. What Latour proposes is a relaunching of the project of anthropology under a new premise of non-modernity, one that distributes unification and multiplicities of natures and cultures. The unbinding of categories assists in re-conceptualising the predicaments of human-environmental interactions. Opening dialogue between disciplines offers incorporation of multiple knowledges, expanding the discourse of human ecology and social theory. The trawl vessel the Harvest Nicola exemplifies the expanded actor-network and demonstrates political ecology in action as it trawls along the Namibian coast. Here, the fishers, the fish, the technologies, markets, scientists, and researchers, and marine life illustrate a different lens in which to understand the Namibian hake fishery. Political ecology thus refers to the re-orientation of prior modes of thinking centred on the neo-Marxist discourse of political economy coupled with ecology studies. My research engages the term political ecology in understanding the hake trawl fishery, emphasising local and global articulations, a critique of the nature/culture dualism, and engaging with an expanded space of natures, cultures, history and power (Biersack & Greenberg 2006).

Therefore, through the lens of cosmopolitics, this research unpacks how a natures-cultures approach speaks to the politics of nature onboard trawl vessels and the implications this has for Total Allowable Catch (TACs), conservation, and implementing fisheries policy. To approach this research through a cosmopolitical lens, it is necessary to address issues of capital, particularly in regards to the use of political ecology as a guiding framework for analysis. Capital in this context draws from Marx's discussions of political economy, and also attempts to expand the notion of commodities and

material capital. Relationships, alliances, knowledge, experience, and social networks all contribute to an expanded form of capital(s), highlighting the complexities of political ecology and local and global tensions arising within the hake sector. Modes of production then, is a term to describe the processes that gave rise to the industrial moment, marked by new technologies, global markets, trans-national movement of products and information, all of which engage at the foundational level of activities within the trawl sector and as such, demonstrate expanding the notion of capital. Furthermore, Greenberg's (2006) discussion on the transformation of nature into commodities and the ultimate tragedy of commoditization further compels the need to re-conceptualise the notion of capital. The tragedy of commoditization speaks to the embedded hierarchies in commodities and the jural rights that emerge from the embodiment of labour. The processes of transformation are of particular interest in this research, and are analysed through a focus on the rise of industrialism in the sector, globalisation of fish products and accessibility for foreign fleets.

Palsson (2006) also provides an important perspective in the shift away from what he terms the regime of the aquarium, or the modernist ideology in environmental studies. In the context of fisheries this means addressing social-ecological implications of governance that move away from assumptions of discontinuity, control, and hierarchy. The regime of the aquarium metaphorically implies the ocean as aquaria and marine biologists and the state as keepers of the aquaria. Fascination with single species and individual animals emphasises control and captivity while naturalising the human world through implanting 'nature' in spaces of artificiality (Palsson 2006). In the re-structuring of anthropology through an integrated practice that incorporates human ecology and social theory, a symmetrical anthropology emerges that considers multiple ways of knowing and engaging with the environment. This provides the opportunity to experience the possibilities of being enmeshed within a social ecological assemblage; re-defining and re-phasing the ways in which we inquire with and sustain our position not as above nature, but interconnected within a social ecological network. Additionally, Lien and Law offer support in how to approach the dualism trap of nature and society empirically in their suggestion of performativity and practices that is sensitive to the complex relations between humans and other living beings (Lien & Law 2010). Through this performative lens, the skippers I engaged with indicated the complexities of a local fishing culture, or more loosely, a Namibian fishing ethos. Ethos in this encompasses elements of history, experience, intuition and dispositions, all of which are apparent in the conversations I had with

skippers and officers. Ethos is important in the discussion of historically oppressed coastal communities, and counters the argument that there is no local fishing culture. Ethos is appropriate in the context of the Walvis Bay trawl sector as it exemplifies dynamic responses and strategies of the skippers, from how they navigate the ocean's topography from their own experiences, trial and error and understanding of the Namibian fishing grounds. Pierre Bourdieu's (1977) conversation on the notion of habitus is an integral point in the discussion of ethos here. The incorporation of the body, sensitivities, habit, and experience within a specified mode of activity speaks clearly to the ways on which skippers engage in their everyday activities. The intangibilities of certain forms of knowledge emerge in tandem with the experiences and understanding of Namibian fishing practices. The skippers are crews enact elements of this ethos in their daily fishing activities, and these actions contribute to their ability to navigate the fishing grounds, the global markets, the company hierarchies and in their interaction with the environment.

Thus, a call for dialogue across disciplines and the recognition of varying knowledge structures within fisheries management echoes the Latourian approach of natures-cultures, networks and assemblages. A natures-cultures approach to understanding the hake fishery in Walvis Bay, Namibia offers insight into the complex linkages of interaction, challenging perceptions, responses, and changes in a place where the multiplicity of natures and cultures collide. For Palsson (2006), a postmodernist anthropology of the environment is "an anthropology sensitive to interconnections, relations of power, and social discourse," (Palsson 2006:92). In order to contest the implications of moving beyond the modernist regime, nature and society can no longer be placed in opposition. Re-evaluating the ways in which non-scientific knowledge also informs an understanding of environmental discourse generates constructive conversation between disciplines. These elements are visible in the commercial hake sector through the processes of fishing and industrial technology, the power relations invested in labour, capital, and global markets, and the social impacts of the fishery on the local community of Walvis Bay and Namibia at large.

Research Goals & Objectives:

This dissertation uses a natures-cultures approach to understand the commercial hake fishery in Walvis Bay, Namibia. Through ethnography, it offers insight into the complexity of fisheries management, knowledges, and the transformation of capital through markets and technologies. If a post-modern anthropology of the environment seeks to obstruct the dualisms of modernity, this study

emphasises the interconnectedness of the fishing industry, highlighting the networks of knowledge, technologies, capital, and policy. Ethnographic research methods allow for a micro-level analysis of the ways in which the hake fishery is conceptualised and experienced by the various actors within this particular sector. By focusing on the hake trawling sub-sector, I am able to provide in-depth analysis, detailing areas that have been previously unfulfilled such as activities at sea, discussions on fisher's knowledge, and perceptions of capital. The crux of my dissertation centres on examining how a natures-cultures framework may attest and contribute to the progression of policy implementation in the hake trawl fishery in Walvis Bay, Namibia and offer depth in the understanding of the fisheries operations as perceived within social processes and interactions. This research aims to illuminate the relationship between nature, science, and politics, demonstrating how obscuring of categories re-shapes an understanding of the hake fishery in Walvis Bay. The intent and goal of this research is to reveal how symmetries may arise out of a natures-cultures framework and thus contribute to policy implementation, specifically EAF. I hope that my research contributes to dialogue in the industry and speak to ways for successful and inclusive fisheries policy. My intention is that ethnography will assist in areas where prior research has been unfulfilled.

Methods:

My research initially began as a project attempting to closely examine the intersections between fisher's knowledge and scientific knowledge in the industrial hake fishery in Walvis Bay, Namibia. My research proposal intended to discuss the science implemented in fisheries management and the contrasts in the information used to determine the total allowable catch (TACs) which is the underlying foundation for the operations of the fishery. I was particularly interested in the knowledges that the fishers acquired and utilised in regards to fish behaviour, as hake is a mobile, bottom-dwelling species. I sensed that there was a wealth of knowledge that the fishers drew upon in their daily activities at sea that was not fully included within the paradigm of fisheries management that relies heavily on the scientific assessments promoted through the Ministry of Fisheries. Thus, keen to engage with fishers and skippers in their trade through observations and conversations I wanted to tease out the complexities of producing, translating and implementing various knowledges. My hope was to engage with fishers from diverse backgrounds and working in the different sectors of trawling, long lining, and small pelagics, thinking that a comparative analysis would further illuminate the multitude of knowledges actively present in the fishery. During the two months I had

in the field I moved quickly to establish meetings and make my initial contacts, as this was contingent upon which fishing vessels were active, when they were at port, and obtaining access to the fishery. Due to these factors, I chose to focus my attention on the trawl sector and engage closely with a single vessel and its crew. This allowed me depth in ethnography and experience, as well as solid relationships with the company. I had also intended to speak with individuals from all levels within the industry including scientists and government officials, but again, due to careful timing while in the field, I chose to dedicate much of my research to the activities while at sea and engagements with individuals working at the fishery in Walvis Bay.

I conducted my fieldwork in the winter months of June and July 2010. The fishery operates year round with the exception of the month of October when the fishery closes for the season. June-July was thus an appropriate time to conduct my fieldwork as the fishery was open and operating and I was able to make contacts with specific companies right away. Due to the industrial nature of the fishery I had to first approach the companies in order to make contacts with the fishers. This was done by selecting companies through the telephone book. Upon entering the field I did not have any prior knowledge as to the different companies so there was no preference given to specific companies but rather I attempted to make initial contact with those who expressed interest and willingness to assist me in my research.

In the phone conversations I made with the companies I explained that I was a Master's student with the University of Cape Town doing research in the fishery that focused on the experiences of skippers and fishers in the industry. I expressed my interest in speaking with skippers and fishers about what they do and initially asked to be directed to whomever might be able to help me get in contact with the appropriate people. After my first phone call I learned that I needed to speak with the shore manager as they handle all of the crews and operations of the vessels on shore and also manage the vessels as they go out to sea and upon their return. I tried to be as explicit as possible in conveying the purpose of my research and that I did not expect them to grant me immediate access or set up any interviews for me. Many times I found that the term Social Anthropology was completely foreign and I had to explain I was not a scientist, but a social scientist interested in working directly with the individuals involved in the industry and speaking with them regarding the work they do. I avoided using terms such as knowledge, science, management and conservation in my initial conversations as I did not want to come across as presumptuous or

confrontational. This strategy worked very well for me and after my first phone call I had arranged a meeting with the general manager that afternoon. Through my asking for references with the first company I was put in contact with another company, and the secretary for the shore skipper was eager to help me make contacts and called upon people she knew who might be interested in working with me. This receptiveness and simple kindness from the individuals I engaged with was profound, and contributed wholeheartedly to the depth of my research.

In my meetings with individuals in management positions I presented them a summary of my research project, briefly outlining my intentions and goals. I realised it was beneficial for both the managers and myself in conveying my research aims. It also added an element of professionalism as I was entering a productive business realm. After my first meeting with the general manager and a brief discussion of the research I was hoping to do, he put me in contact with the shore skipper for the company and from then on I only worked with the shore skippers from the two companies I became closely involved with.

As presented in my research proposal, I intended to utilise a variety of research methods. I was planning to engage in a series of conversations that were informal in their structure. I did not have a specific set of interview questions that I used in each conversation but rather approached the conversation with themes and topics in hopes that they would encourage dialogue and discussion from a personal perspective. I also intended to familiarise myself with the fishery through spending time at the harbour and walking around. I soon realised that this was not an option as each company has it's own dock, and entrance into the business areas are monitored and gated. This meant that I had to arrange my time at the harbour through an appointment with the shore skipper or fleet manager (with one company I worked with the shore skipper the other I worked with the fleet manager). As I became more comfortable with my place as a researcher and developed rapport with the managers as well as the skippers and crews I was able to access the fishery in a non-formal manner of either phoning the fleet manager directly in his office or if he was out of office, SMS or phone call to his mobile.

I used a recording device in eight of the conversations that I had of which I transcribed myself while in the field. If I did use the recording device I asked permission and presented a consent form for all parties to sign, myself included. However, I found that the recording device was often more of a distraction than an aid and it's presence caused some unease with the participants. As much

as I was able to I decided to only use the recording device in situations where I felt it would be absolutely necessary, usually in the more formal settings with multiple participants onshore. Otherwise I relied on my own notes that I took during conversations and consolidated in my field journal. As a native English speaker all conversations were done in English. Afrikaans is the dominant language but all of the individuals I spoke with were comfortable conversing in English. While I was out at sea I documented the fishing activities with photographs in order to supplement my descriptive analysis and illustrate the scope of hake trawling at the industrial level. I was encouraged by the skipper to take photos and the crewmembers were keen to be in the photos. I always asked permission before photographing people and made a disc of the photos for the crew.

The importance of embarking upon an ethnographic study in a field dominated by hard scientific research is reflected within this dissertation. The richness of engagement and complexity of experience is captured here in hopes that the boundaries of disciplines and various forms of knowledge and methods may be able to engage in critical dialogue with each other. As I was in the field, I was constantly aware that "the distinctive anthropological voice – the aspiration for cross-culturally attentive perspectives – continues to be valuable amid the pressures to simply turn to statistical indices for all policies and judgments," (Fischer 2003:4). The urgency to develop, understand, translate and narrate the inner workings of the hake fishery through ethnography, supplemented with other forms of knowledge and data reflect a complexity within current scholarship in Southern Africa and will continue to emerge as a robust approach to new generations of social anthropologists.

Particular to this area of study and the imperative to engage inclusively with an abundance of individuals, communities, scholars, resources and the environment, the role of anthropology becomes a critically important avenue in which to seek out and explore emerging domains of knowledge and experiences. Above all, as our world confronts new kinds of ethical dilemmas expanding from an ever-increasing technological realm, our access and contributions to the information and scholarly vault reveal a constellation of complexity of which ethnography provides grounding to develop tools for analysis. Through the continued ethnographic project may we be able to move beyond the categorical demarcations and limitations of the past, and thus observe and help articulate new ways of thinking and engaging with the world we inhabit.

From my close work with one vessel, the Harvest Nicola, I was able to go to sea on three different occasions, supplementing my research done at the fishery in Walvis Bay and in the community. My research demonstrates the complexity of an industrial fishery, and highlights the role of the hake sub-sector for the local economy. Integrating social theory, ethnography, and policy analysis, I am able to provide an in-depth discussion of the political ecology present in the hake trawl sector. My research shows the importance of fishers' knowledge and application of practical knowledge at sea; the rise of industrial technologies and the role they have in commercial fishing and in transforming the environment; the need to expand perceptions of capital; and the disconnects in EAF policies, pointing to unrealised goals of Namibianisation.

Ethics

In considering research in the social sciences, the department of Social Anthropology at UCT follows deliberate processes of evaluating the research proposal the each student presents to the ethics committee consisting of the Head of Department and at least four other senior faculty members. During the proposal presentation, the faculty raise concerns and questions that may arise out of the proposed research. Suggestions may be offered and after careful consideration, those present make a final decision to allow the research to proceed. Once I was in the field, I drew up a consent form for any formal conversations that would take place, describing the nature of my research, stating how the transcript would be used (if at all), my own commitment to each individual's anonymity should they request it (none did, they wanted their real names in my research), and my obligation to provide each individual with a copy of the final document. On the vessel I was careful to respect the space of the skipper, ask permission to photograph, and keep out of the way when they were shooting or picking up as this required careful attention and there was a lot of activity on the deck. I do not feel that my ethics as a researcher or those of the university I represent were compromised in any instance.

Structure of Thesis

The thesis is structured in three chapters that are as follows:

Chapter 1 Introduces the fishery through analysis of the rise of industrialism and discusses the interconnectedness of knowledge, skills, and technologies. This chapter describes the ways in which skippers interpret the environment and emphasises the integration of knowledges, and the role of technologies in transforming the environment.

Chapter 2 Due to the scale of operations at the commercial level, this chapter examines the notion of capital as it is experienced and negotiated in the sector. Drawing on ethnographic material from two weeks onboard a trawling vessel spread over three different trips, the chapter discusses how capital(s) manifest in knowledges, social relationships, technologies, and commodities.

Chapter 3 Links industrialism, notions of capital(s), and experience through Namibianisation policies that have been largely unfulfilled. Weaving ethnography of identity, knowledge, and ethos with policy and management, this chapter points to gaps in policy and the perceptions of a Namibian for Namibians industry through the lens of individuals working in the sector.

Chapter 1

The Paradox of Technologies: The Rise of Industrialism, Tracing Material Flows and Shifting Modes of Production

" What makes a skipper? One nice bosun, one nice net and one nice vessel. Ja? You see? It's the truth!" – Vernon 2010, Skipper Poble Amaro

As the blazing red Namibian sun was descending on the Atlantic Ocean, the crew of the Harvest Nicola were chatting casually on the jetty. The ice was being loaded into the hold, the skipper was checking all of the electronic equipment on the bridge, and I paced along the dock with excitement and anxiety for my first trip out to sea. I had no idea what to expect but couldn't resist feeling the air of anticipation that rippled through the chatter and activity. Crew members clustered in groups, all dressed in smart clothes, many of them furiously using their mobile phones to keep in touch with family and friends for as long as possible. The horn rang and the crew gathered their small bags of belongings and food and one by one, we boarded the vessel. I took a prime spot on the bridge, looking out at the company jetty and watched excitedly as the skipper began to slowly steer the boat away from the dock. As we entered the fairway I took one last glance behind and watched the port slowly become smaller and smaller. The sun was setting on the horizon and we were sailing to the north with a plan of steaming to the seventeenth degree near the Angolan border. We would steam through the night and arrive at the desired fishing ground the next afternoon. The crew retired to their cabins immediately to rest as much as possible before the fishing commenced. The mood was relaxed and the sun was shining, casting a picturesque glimmer across the ocean. I stayed on the bridge as the night unfolded on the open sea, and the woman second officer Uillika, seemed pleased to have another female companion on board even though I knew little about the trawling process and could not stop asking questions. The next morning we were up at 05h00 in the dark again, still steaming north. Sometime during the night the autopilot began to act up and it became non-functional as the dawn brought the sun and calm seas. Suddenly, the tension rose and stress levels escalated; the skipper began chain smoking cigarettes and the chief engineer, officers and bosun were in and out of the bridge area, talking quickly and urgently about how to remedy the malfunctioning autopilot. The

problem was that the autopilot was consistently veering off the set course and there was a miscommunication between setting the course and the actual direction the vessel went.

Ultimately, the entire steering mechanism failed and therefore someone had to manually navigate the discrepancy between the designated course and the following of it. The chief engineer was up and down between the engine room and the bridge, checking fuses and lines of electrical wires. He dismantled the box that the autopilot is placed in and re-configured the wires, testing and re-testing different connections. Nothing was resolving the issue. By mid-morning the problem had escalated and no one could determine the root of the problem. Fishing would not be possible without a functioning autopilot. The vessel was zigzagging as it was heading in too sharp of a turn and the skipper had to over correct to bring it back on track. There was no way a trawl net could be released with the uneven movement of the vessel, let alone trawling safely and effectively as we cut a ragged path across the otherwise calm seas. The skipper used the satellite phone to call the company and in a matter of a few tense minutes, the final decision was made. We would turn back. The skipper told me, “we can’t steer the boat like this. And we definitely can’t trawl like this.” Ultimately, it was him who made the decision as he is trusted by the company to execute his knowledge and experience. The skipper is essentially in charge of the well being of the crew while out at sea. There was a sense of resignation and frustration between everybody onboard. Individual members of the crew that were on the bridge dispersed back to their cabins, and the skipper and officers sighed in silence. One and a half days of steaming and no fishing had occurred. The nets remained unused on the deck, the holds were still full of ice and no fish. Even for me, this was the ultimate disappointment, as I was yet to experience the process of trawling for hake, and was just beginning to acclimate to the movement of the ocean.

We arrived back at the Walvis Bay jetty on a Sunday morning. The company had arranged for a specialised technician to meet us in the fairway in hopes that he would resolve the problem of the autopilot straight away and we would sail again that afternoon. We did not dock at the jetty but a small speedboat brought the technician to us as we idled in the fairway. He was furiously put to work removing the autopilot and attempting to pinpoint the problem. I could only observe at this point as tension was high and I did not feel comfortable asking for a translation of everything that was being discussed in Afrikaans. Hours ticked by and the technician and engineer were still working on the

autopilot. The sun began to set on the sea and impatience and boredom rippled through the crew as they were sitting on the front of the vessel smoking and talking. After spending the day in the fairway, doing small test steams, we ended up docking at the company jetty around 16h00. We disembarked and everyone dispersed as quickly as possible, with instruction to re-convene the following morning 08h00.

The futility of this trip exemplifies how reliance on technology is negotiated in a situation that has turned unfavourable. The skipper's responsibility to ensure that his crew remained safe while also accounting for the consequences of not catching any fish presents an instance where there is a need to have technology functional in order for the rest of the process to occur. After the steering mechanism failed, the skipper continued to steer the vessel manually, which indicates his ability to manoeuvre without that technology, but at this scale of fishing, even though the skipper maintained control of the vessel and knew exactly how to manage our course of direction, the design of the trawling vessel does not accommodate fishing without the auto-steering mechanism. Often during the trawls the skipper leaves his post in the captain's seat and turns around to face the back of the vessel where all of the action is happening whether they are shooting the nets or picking up. The skipper relies on the autopilot to maintain course and a steady speed so that he is able to release the nets or pull them in, all of his attention directed to the activities on deck. Therefore, the failure of a single piece of equipment resulted in the discontinuation of the trip and a loss of two days at sea with no returns. The reliance on technology is profound in this instance as the fishing trip was unable to commence due to the autopilot malfunctioning. This is not to discount the skipper's ability to drive the vessel manually, but illustrates the dependent and interactive relationships of all the components on board. These relationships, between people, equipment, electronics and the company all seek the same goal: finding the fish and catching them. If a single error or disjunction emerges, the entire operation is threatened. In this case, no fish were caught but fuel, time and energy were invested in the trip that comes full circle to consequences in income for the crew and the company. The meshwork in which these relationships emerge resonates with Latour's (2005) discussion of actors and the motivations that propel action in a situation. Here, the autopilot precipitated action through its inaction, instigating a series of events that unfolded from the moment it began to malfunction.

The processes of fishing have been assisted through industrialisation and speak to the logics of technology, or the ways in which we conceptualise the physical nature of technologies as well as their multitude of uses. Recent discourse (see Johnsen et al 2009) on commercial fishing practices describes them as abstracted, robotic, and mechanised. The discussions present large-scale fishing in a manner that suggests an automatic process in which skills and experience are disregarded in favour of reliance on technology. However, as exemplified in the example of the steering mechanism failure, trawling vessels require the incorporation of knowledge, skill, and experience from the skipper. While there are elements of mechanisation within the trawling industry, it is not a simple task to operate and navigate the vessel and it could certainly not be done through only technology. Rather, there are new and emergent ways of knowing the fishing environment, through the interpretation of indicators and signs, as an extension of the skipper's personal experience and techniques at sea. While recent fisheries management initiatives now aim to control both the human and natural impacts in governance, my research reveals a much more enmeshed network of complex relationships within the scope of industrialisation. In the hake sub-sector, globalisation propels rapid extraction and high-pressure economic conditions. In this context, the commercial industry operates within global structures of economics that cater to free market ideals and maximum profitability with aims to also sustain a robust local economy. Industrial technologies contribute to the ways in which this industry caters to the global demands for hake and therefore directly impact the local Namibian economy. The markets for hake in Europe, South Africa, and the United States require specific modes of production within Namibian fishing practices, such as trawling, which allows efficient technologies and machines to assist in catching and processing the fish for immediate entry onto the market.

In the initial meetings that I had with skippers, the first piece of information that they spoke of was the technology. When I asked a general question as to the process of trawling for hake, they immediately spoke of the technological devices that aided them in this process such as the fish trackers and echo sounders. Coming into the field and not having any personal experience in a commercial fishery, I realised my surprise at the role of technologies during fishing. It soon became apparent the unique ways in which the skippers and crew utilise the assistance of technologies to expand their knowledge and skill in order to fish at such at large scale. Technologies are an important addition to the mobility of knowledge, commodities and information within this sector as they facilitate commercial fishing practices. Knowledge mobilises through the use of technologies, whether it is in reading the information coming from the electronic devices or passing through to

other skippers in the area. Experience and embodied knowledge manifests in what the technologies cannot create, manage or measure through the machinery, essentially all of the social elements and relationships that contribute to the functioning of a successful fishing trip. The uncertainties of fishing present constant challenges for the skipper and it is in these instances that his personal experience, local knowledge and instincts are drawn upon to make concrete decisions while at sea.

The processes of mechanisation and the emergence of industrial technologies within this sector reveal the interconnectedness of people, markets, and natures and how they inform action through fishing, processing the product, and threads of communication. The hake sector, and specifically the trawling industry remains the dominant means of extraction and processing in Walvis Bay, as the product continues to have a favourable attraction on the market and operation costs remain manageable. The rise of industrial technologies results in a paradox within global fishing activities as the catch capacity, through the expansion of technology and gear, now exceeds the limitations of the total allowable catches (TACs), and therefore an important element in fisheries economics and management. On one hand, this robust industry is bringing economic growth and stability to Namibia and its citizens, while on the other hand, increased and aggressive extraction practices threaten the natural environment and increase the uncertainties of prolonged use of the ocean's resources. With the introduction of TACs, it was intended "to determine the annual catching of the major fish species operating within the 200 nautical miles of EEZ. The TAC is fixed every year by the MFMR, based on scientific recommendations. TAC is then sub-divided into quotas that are allocated to fishing companies with rights of exploitation. Quotas allocated to rights holders vary over time with fluctuations in the TAC, changes in vessels in the fleet, and changes in allocations to existing vessels. Quotas and licences are granted on performance and criteria determining the capacity of utilising the resources," (Erastus 2002:7). My third trip to sea was the last trip that this particular vessel sailed on as the company had already reached their maximum quota, months before the renewal and redistribution of quota allocations.

Advances in fishing technologies reflects a distinct shift in the operation of the fisheries toward a rapid machination of the fishing process and as a means of negotiating and interpreting the semiotics embedded within the natural, social and economic networks. There have been several studies from Norway, Canada and other North Atlantic countries describe radical changes in technology, organization, fleet structure, knowledge, fisheries management, property rights, and

relationships to communities across a number of fisheries that show the role of fisheries management (Johnsen et al 2009:9-10). These studies reflect varying responses to the rise of industrial technologies, the role of local communities in fisheries management and changes in fishing practices. In this sense, technological networks are a physical presence and necessity but also represent another level in the actor-networks as they mediate and facilitate the social relations and knowledges deployed. While there are uncertainties in the outcome of each fishing trip, when problems arise out of equipment malfunctioning this points to the interconnectedness of successful fishing as facilitated through technologies. The consequences of a trip such as the one described above impact all of the crewmembers onboard as well as the company. Through the inclusion of knowledge in regards to technologies, the crewmembers and their relations with each other as they work are not threatened by the mechanical devices, but rather utilise the technologies to assist them and strengthen their roles on the vessel. In my experience at sea, the use of technologies does not seek to replace the individual fishermen but effectively produce new forms of knowledge and practice, arising out of the augmentation of fishing practices through technologies. Rather, the process of fishing is a network of relations and activities where different individuals specialise and the machines become an extension of the process of fishing, embedded within prior histories of fishing practices and experiences.

Role of Technologies: Perceptions and Practice

How social history transforms perceptions of machinery points to the continuum of technological innovation. As I observed the skipper manually steering the thirty metre steel vessel back to port it was clear how he was able to integrate both skills-based knowledge and technology-based knowledge in his actions. He seamlessly directed the vessel along a set course, constantly checking the coordinates through GPS, while simultaneously gently moving the manual steering control every few minutes. Although a zigzagging vessel is certainly not the ideal manner in which to sail back to port, the skipper utilised these various skills to assist him in getting us back safely. It was in this instance that I realised the importance of skill and experience and my own trust in the skipper's knowledge was sealed. Technologies offer new ways to understand and navigate the sea and are incorporated into the praxis of skills and experience, contributing to an integrated network of knowledges. The construct of technology is useful in a broader sense, as facilitator and mediator of nature but not replacing prior forms of knowledge and practice. Technologies in this particular context are specific and reflect a distinct logic embedded within their use that centres on productivity,

efficiency and accumulation. Due to the scale of operations in the hake trawl sector, technologies play an integral role in the negotiations of exchange, whether it is communicating through radio where successful fishing occurs or using an echo sounder to gauge activity beneath the surface. The socio-technical networks visible within the hake sector speak to the rapidly expanding dependence and necessity for complex and expensive technologies. The presence of these technologies on board encompass an emergent body of knowledge that is linked to globalised markets and assists in processes of transformation within the sector. Mediation and facilitation of the relations between the skipper, the crew, the vessel, the fish and the global market reflect the tensions of mechanisation through their engagement with each other through the medium of technologies.

Emergence of Industrial Technologies in the Hake Sector: Economic Implications

Technologies assist the fishing vessels in increasing productivity and efficiency, thus reflecting the relationship between the economic and technological enterprise of the industry. While innovations in technology certainly assist in productive fishing trips, it is also apparent that these technologies are simultaneously incurring detrimental impacts on the natural environment in which they are deployed. The complex assemblage of fisher's knowledge and practice, market demands and fluctuations, and the social impacts within the coastal community speaks to the meshwork of interactions. The machine is not an apolitical entity that exists solely on its own, but is generated out of specific agendas related to conceptions of modernity such as capitalism, industrialisation and the science/nature binary. The fallacy of modernism arises out of the structural determinism of capitalism that relies on dualistic thought processes, favouring hard science and removing the human element from conceptions of nature. From my experience while out at sea, the vessel, and all of its technological components had political elements and attachments but ultimately the vessel as a machine did not mean further abstraction from the activity of fishing. Instead, I noticed how the technologies were immersed within a socio-technical assemblage, linking the skipper and crewmembers to the company back on shore, other vessels in the area and the sea itself. In the process of trawling, the different kinds of technology present become sites of exchange and are politicised spaces within the greater structures of commercial fishing. The echo sounders, GPS and fish tracking devices serve both to interpret signs and are means of communication, also serving as facilitators of relations.

The relationship between technology and economics is an important discussion point due to the pronounced interconnectedness. While there are state of the art technologies and machines in use, the integrated knowledge from experience also contributes to the overall activities and decision making while out at sea. Reliance on technologies and gear is necessary, but in contrast to alienation from their work, the skipper with whom I sailed embraces these new forms of assistance and couples them with his experience and instincts. The rise of industrial technology resonates with the rise of free markets and international accessibility for goods. Consider how the idea of a machine shifts and expands throughout history, from the invention of the wheel to nanotechnology, thus reflecting political, economic and technological advances across a wide spectrum. It is clear that the rift between technology and skills based knowledge remains interconnected in trawling practices and thus a concrete example of an assemblage of knowledge rather than a knowledge binary. The trawling vessels are equipped with very similar electronic devices, gear and radios so there is less novelty in acquiring these devices, as it is such a commonality within the sector. One skipper expressed to me that when the company did begin outfitting the vessels with new forms of technologies and devices that it was a relief – "before, without these things, it was like a blind man. Like a blind man fishing. Now, we have GPS, fish trackers, and sensors that help us see what we're doing, ne? It's much, much better fishing this way."

Signs: Navigating and Interpreting While at Sea

My second trip to sea departed at night and only after waiting at the jetty for hours were we able to sail. Fuel for the vessel comes from South Africa, and it had been a public holiday there and thus the paperwork for requesting and acquiring fuel had been left unattended to. Calls were made and an alternative form released the fuel to our vessel, and then it took over an hour for about 180,000 litres of petrol to be pumped in. When we finally left the jetty the night was pitch black, only the dim lights from the company jetty flickered behind us on the horizon as we cruised through the fairway. Already I could tell that the sea was a bit rougher than on my first trip and had to take a seasickness tablet immediately. Eager to begin fishing, the skipper informed me that we would steam through most of the night and shoot in the early hours of the morning. I stayed on the bridge for a few hours, but I was beginning to feel uncomfortable as the vessel bounced of the vessel through the swell and had to retire early. My bunk was located near the doorway to the lower deck, and directly on the other side of my sleeping space was one of the cable spools. It was loud here, particularly

when the nets were being released or pulled in. If I happened to be in the cabin when these activities started, I could hear right away as the cable spools began to roll in a rumbling groan, abruptly stopping with a screech and starting again as the net was unfolded and the buoys were untangled, the smacking of the wires on the metal. I began to anticipate these sounds, especially during the night hours when I would read, write in my field journal, or talk to Uillika in our cabin until we fell asleep, because once the winches started up I knew I had about fifteen minutes to get up on deck before the catch was landed. I was surprised at my ability to sleep with so much noise happening around me. Even when we were trawling or steaming, the hum of the engines, wind blowing stray buoys, even the splashing of the water on the vessel as we plunged along allowed for fitful sleep and the constant fear of rolling out of my bunk.

I quickly found my favourite spot on the vessel in the first couple of days when I was still feeling the unsettling motion of the sea. I went outside on the top deck, just outside of the bridge where I could sit on a metal cylinder while looking out at the open sea. I found this space to be a wonderful spot to watch for other vessels, have the cool wind across my face and the sun shining down. It was also an ideal spot to observe the processes of trawling, picking up and shooting, as I could get right above the lower deck and see what each individual was doing. During the first pickup I found myself brimming with anticipation. How much fish would be in the net? What else might come up with the net? As I was pondering these brief thoughts, the crackling of the trawl cables as they wrapped slowly around their massive spools and the screech of the pulley mechanism as it slowly reeled in the net caught my attention and I waited to see what would emerge from beneath the surface. While the cables were being reeled in, I began to notice that birds had begun to swarm the vessel, some of them landing on the masts and others landing in the water surrounding the vessel. I had not seen this many birds while outside before, it seemed as though they knew what was happening. As if they were able to hear the same sounds that I was soon to become familiar with, the sounds of the net being reeled in and the increased hum of the engines as the vessel slowly moved forward on a straight course. The net was still underwater but the birds had arrived in full force. As I was watching the birds landing in the water, I saw a small splash and my first hope was that it was a dolphin, but I soon realised that it was a seal. Many seals, actually. The seals began to swim along with the vessel, some on the side and others in the back. All of a sudden, the stark, steel fishing vessel was bursting with activity. On the deck, the crewmembers were suited up in gumboots, bright orange rubber overalls, thick gloves and hard hats. The first signs of the net were the bright yellow buoys,

popping up like gumballs in a sea of deep blue frosting, and then with a burst of bubbles, the net shot up out of the water and making a splash bounced around, glistening with silvery speckles. The skipper ran outside onto the upper deck as the net slowly worked its way closer and closer to the vessel, trying to gauge how full the net was. To me, it looked quite empty as hundreds of metres of net was reeled in before the bulk of the fish came through, all pushed to the very end of the net. As the net came in and was also coiled around the spools, the crewmembers on deck had to clear out stray catch, and often times the net was stopped to ensure that everything was cleared. I was surprised at how gory I found this to be, the fish often still gasping for air as their gills were stretched to near tearing point in the thick net, and the crewmembers yanking them out, sometimes ripping them into pieces and then tossing them onto the deck. In this sense, I felt that as the net was picked up, from the moment the fish became visible to those of us onboard, the fish symbolised a dollar sign. And the more fish there were in that net, the more secure the crewmembers felt in their occupation and their ability to provide for themselves and their families.

After the flurry of activity as the net was pulled in, I observed as the crewmembers hosed down the deck, washing the pieces of fish, jellyfish, and bits of debris back into the sea. They then put their hats and gloves back in the trunks on deck and retired back to their cabins. Below deck, the first steps for processing had started. The fish travel down a chute from the deck into the onboard fish factory. There, they are moved along a conveyor belt as their heads are chopped off and the crewmembers sort them by size: small, medium, and large. The guts are cleaned out and the fish are packed into bins and then put on ice in the holds. The number of bins for each size hake that is landed on each trawl is recorded alongside the coordinates and time of pickup. On the trips that I sailed on, the goal for each trip was around 2000 bins. I observed when as few as ten bins were filled on a trawl (during the night), and as many as 300 bins were filled. Back on the upper deck, I watched as the first indications of processing became visible outside of the vessel. The heads and guts are discarded through a small window from below deck, and I saw seals and birds rushing to acquire this newly available food as it came out of the window. This scene, the heaving of the net, the diesel smell on the sea breeze, the fishermen processing their catch while seals and birds are eagerly awaiting the offal provides a perfect example of the vessel and environment as enmeshed in a relationship of transformation, semiotics, and mediation.

The skipper and crewmembers have a close understanding of the sensory sign systems of

the physical experience and the natural landscape as they fish. They spoke about the colour of the sea and how they can gauge where in the water they expect the fish to be, near the surface or at the bottom based on the time of day, which speaks to the complexity of an environment where vision comes in multiple layers. The ways in which they navigate this environment speaks to the ways that "social practice is a cultural process that conditions human beings to respond in specific ways to particular signs," (Hornborg 2001:130). The social aspect of fishing emerges from the networks of communication and exchange that solidify the prospects of return. The skipper and crew enact a sensitive response in their work and embody an experience of being at sea and employing different forms of material technologies. The ways in which they are able to interact with the environment through their sensory perceptions, what they see, hear and feel, contributes to each fishing trip. Sight is an important sense for the fishermen as the visual landscape above water assists in how they are able to interpret the (in)visible landscape underwater.

Signs and Technologies: Networks of Knowledge

My experience and analysis of the processes of fishing exemplify the significance of the vessel and its environs while at sea and draws from actor-network theory (Latour 1993,1995). The relations present encompass a wide spectrum of actors, subjects, objects and ideas. Activities on deck, in the fish-processing factory and on the bridge reflect routine and order but not systemic mechanisation. Rather, the activities are often unpredictable and disruptions allow for on the spot moments of decision-making and action. In the context of the hake fishery, the fishers, the fish, the managers and the technologies present are not detached from the process and their interacting sustains the enterprise of fishing. Within the dynamic nature of the hake fishery, actors can acquire new attributes, roles and abilities that directly impact the fishing practices. The abundance of activity that is present while the trawl net is pulled in reflects how the vessel and its environs are drawn together through the network of politics, capital, and relations. The seals and birds anticipate the hauling in of the net and as this happens, the seals swim directly next to the net pulling fish out and chomping them happily. On two different occasions seals were caught in the net itself, and only once the fish had been emptied could the crewmembers attend to the rogue seal. Eventually, they had to use a plastic crate to trap the seal and then encourage it to go back into the sea. Meanwhile, birds also landed right on top of the end of the net where all of the fish were, pecking eagerly at the defenceless and exposed catch. Squawking, flapping and crowing, the birds certainly made a racket. It was an

interesting sight to encounter other vessels in the area, I could soon tell whether they were trawling or picking up, based on the bird activity and speed of the vessel. As I would watch other vessels from afar, it was clear to me the political ecology that was being represented. The vessel bobbing along, the net in the water, the birds swarming and circling overhead, seals gliding along in the wake, and the crew preparing and engaging on deck. The dynamism of this sign system reveals how the semiotic components are interpreted within the fishing environment and also points to the political elements of the network of relationships on board that generate the knowledge structures necessary for successful fishing.

The fishing vessel while at sea demonstrates the interstices of political ecology, highlighting the relationships between technologies, the sea, humans and a system of communication and control. The skipper and crew interpret and respond to the various signs that are present in the processes of fishing such as weather, the colour of the sea, the echo sounder, conversations with other vessels, and the presence of other marine life such as birds and seals. The significance of the vessel as it represents the complex relations between material culture and the signs it responds to while at sea, is its ability to negotiate signs and activities within the network of political ecology. Conversely, the birds, seals, and marine life underneath the surface also read the signs emitted from the vessel through the discarding of fish heads and guts, dragging of the trawl nets across the ocean floor, and pollution coming from petrol and rubbish. Together, these complex relations and interpretations of signs constitute a network of political ecology. The notion of the vessel as a machine bears new meanings, in the sense that it is a material object of which social relations are interlinked with capital, politics, and the biological environment.

The continued reliance on and investment on in various forms of technologies that have resulted in a shift from local ecological knowledge to global harvesting knowledge (Johnsen et al 2009) reflect a multitude of relational experiences that are interested in controlling the human-nature interaction. While Johnsen et al (2009) suggest that the rise of industrialisation is prompting mechanised fishing practices where the skippers' experiences, wealth of knowledge gained through time and their relations with the sea, their crew, and their country no longer impact the overall fishing goals due to these relations being replaced via machinery. My research contests this concrete aversion toward the industrial fishing practices at hand. While industrial technologies are a necessary

component within the industrial fishery, they dynamism, uncertainties and fitting together the pieces of the puzzle while at sea draw from specific knowledge and experience that assists the use of technologies but is not replaced by them. Politics are also reflected within the relations embedded within the human-nature interactions. The integration of industrial technologies allow for enhanced mediation and facilitation. In a conversation with a young skipper, he openly expressed his desire to move up the corporate ladder within his company and explained the difficulties he faces on each trip due to the absence of one piece of technology that he feels is extremely vital to the success of his fishing. His vessel's net sensor broke and due to the costs and company politics of prioritising replacements, he is required to fish without one. This piece of technology is a small sensor that is attached to the net and gives a signal when the net is full. As Vernon described to me, "it's like one device that has been put on the cod end of the net. So it will give a signal when the net is full. And one is a headlight sensor it will tell you, the fish going into the net. But mine is broken. I don't have one. So I have to just throw my net into the water and just pray. Pray, I have to pray that fish is going in."

It is interesting to hear that without this piece of technology Vernon seems resigned to the fact that he has no control over what is coming into his net because he can not read the signs emanating from the device. He feels vulnerable without that particular sign system that would designate what is occurring underwater, even if those signs still contain a level of uncertainty. Not only does this sensor allow the skipper to track how full the net is, it also serves to indicate if there are problems with the net as it is trawled. "You see, so this net, this headlight sensor also tells you how far your net is opening and if there's any problem with the net. So uh, basically we rely on this, ne?" When asked how what the repercussions the absence of this sensor had on his catch, he earnestly stated that, "there was a lot of it, had a big influence on my catch. Because uh, you cannot see basically what's going on with your net and it's, it's, now I am not getting paid very well because I am not catching a lot of fish. You have to see, basically because sometimes it's a problem with your net in the water like if you shoot your net. Cause normally we make three, four hours trawls, ne? So, you shoot your net and something is wrong inside the water, like one of the floats is stuck in the headlight in the footrope, something is stuck and the net is closed. Now, you trawl this four hours, without noticing something is wrong. So when you pick up, you pick up nothing. While when if you had the headline sensor, when something was wrong you would have noticed maybe in the first ten or

five minutes you would know that something is wrong, and I pick up my net. But no, you have, if you don't know something is wrong so you trawl this for hours out without anything you notice, if anything is wrong and pick up, nothing. So it's a lose for me and for the company also." Because of the stop and go activity during trawling, it is crucial that the skipper is aware that the gear is used properly. Once the net is shot into the water, the signs that something is wrong appear in the tiny details that the skipper has learned to gauge both through technology and his own experiences. The net sensors also serve to inform the skipper an approximate weight of what is caught in the net, which is important when the company is particular to the quality of the fish. Throughout the time spent dragging the net, the weight pushes on the catch as it is caught. Therefore, long, heavy trawls risks damaging the fish as the pressure weighs down on them in the net. Shorter, lighter trawls results in less fish caught but higher quality due to their preservation within the net. The net sensor helps the skipper gauge when to pickup depending on the requests of the company for quality fish. Furthermore, the intervals between trawls are also mediated so that the fish factory on board does not become too full. As the fish go into the factory, a whole new process of de-heading and cleaning occurs, and the crewmembers working there can only process a certain amount of fish at a time. The activities on deck must coincide with the capacity of the activities below deck in the factory. The two sites of production need to work in tandem to catch, clean, and store the fish until they are unloaded for on-shore processing.

On another occasion I spoke with a skipper who had recently returned from a fishing trip where they experienced monstrous swells and gale force winds, yet they continued to fish and were successful. Weather conditions not only assist in predicting when and where the fish may be caught, but also speaks to the versatility of knowledge and skill required to trawl in harsh conditions. He explained to me how difficult it is to fish in these types of conditions, when waves are crashing over the decks, the boat is rocking furiously and the wind is whipping all around. The environment transforms the vessel in similar ways to how the vessel affects the environment, each provokes the uncertainty of the other, yet simultaneously share a dependency.

Technologies and Political Ecology: Transformations and Implications

The vessel itself is part of the transformation of the environment, even as it sits at the dock. As the vessel departs from the jetty, steaming toward the desired fishing grounds, it embarks upon a segment of transformation and disruption. As the nets are shot into the water, the (in)visibility of activity under the surface requires different ways of seeing through the technologies. As I watched this process for the first time it did seem a strange phenomenon in watching hundreds of metres of bright green net loaded with neon yellow buoys float out behind the vessel. With a reverberating clang the trawl doors were dropped into the water, bulks of steel weighing at least a tonne each, crashing into the water and quickly dropping below the surface. When the trawl nets are underwater, they are dragged along the bottom of the ocean floor for periods of several hours. For me, I was curious to what was happening underwater, and with no prior knowledge to the use of echo sounders and fish trackers was even more puzzled as the skipper explained what he was seeing on the screens in the bridge. He knew exactly what he was looking for on the screens, and a slight jump or peak in the lines coming through were interpreted precisely. The signals on the screen are basically green, yellow, and red colour graphs and their salience on the screen depends on what is happening underwater. If there is little activity underwater the colours will be scarce, with more activity the colours will come through stronger. Essentially the signals coming through on the screen are lines and colours and inherently unreadable for someone not skilled in interpreting them, such as myself.

Technological mediums assist in interpreting the fishing environment and represent a complex sign system that changes on each trip and affects production within the trawl sector. Technological mediators are integrated within a system of navigating the sea, where weather conditions are also important. Furthermore, the vessel itself is part of this sign system where top predators such as seals and birds associate the fishing vessel with food. The fishery itself has transformed significantly since Independence and the entire basis of operation has shifted due to the economic systems and global influences that are still actively informing and demanding from the industry. Technologies and the reliance upon the multitude of devices presents a sense of alienation from the social practices that inform activity and the processes of accumulation, exchange of labour and the product itself. Such abstractions are possible through the industrial operations of the sector, where concerns are asymmetrically focused on the end product (in its quantity and quality, or market appeal) with less regard to the network of interactions that occur between all levels of the fishery. The role of

technologies emphasises a measure of progress while also distinguishes intricate relations of production and efficiency.

Technologies are integral in mediating the uncertainties of fish stocks and access to resources and for the skipper, their assistance helps to curb some of the uncertainty. I sensed that the skippers underestimate or perhaps internalise their own capacity to navigate and fish in the absence of specific gear, not because they are incapable but because application of technological knowledge has become an integral part of their fishing process. This is apparent in a conversation I had with Vernon in which he described to me how he is able to use alternative methods in the absence of the net sensor. Instead of relying solely on this device, his awareness of other indicators when navigating his vessel while fishing, particularly what he can see, feel, and hear. As he described, "the only thing you have to rely on to know is your speed. The speed you are trawling. Is only the speed. On this vessel now you all have to rely on your speed, so when you know that something is wrong with your nets maybe it's got a tear or something, so your speed will drop, so it will get stuck underneath. So your speed will drop, drop, drop so you know something is wrong and you have to pick up. It's the only way, there's no other way. There's no other way. That's the only way," (Vernon 2010). This method thus relies on his being able to feel the vessel's momentum shift, indicating the possibility of an issue with the net underwater. Since there is no way to visually confirm a problem with the net while it is underwater, the skipper uses his senses to maintains an increased sensitivity to the surrounding influences of the sea, his gear, technology, and his own experiences.

I met two skippers on my second venture to the Seawork jetty. Bennie and Donovan are both skippers on trawling vessels of about twenty-nine crewmembers and when I met them, Bennie had just returned from a six-day fishing trip and Donovan was waiting to depart. As the shore skipper, Norman, led me down to where they were working on land, I saw a group of men, ten or so, stretching out metres of green net on the ground. The net was thick and heavy and I was curious to see what they were doing with it. I was introduced to the two men and immediately asked what they were doing with the net. Bennie explained to me that while the fishing trip was successful, and they had filled the holds within a week, he noticed that one of his nets did not want to catch as many fish as the other. He told me that he was trying a new strategy with this net, unfolding it and making extra knots here and there. I was very curious with this detail as he was describing agentive capacity

of both the fish and of the net. I asked him why he thought the fish did not want to be caught by this net or why that particular net did not want to catch fish, and he smiled and shrugged, but said he had to try something new to see if it made a difference. Bennie remarked to me that, “anyone can be a skipper, but to be successful you must have instinct!” He was using his instinct and experience with the nets in hopes that his new strategy would assist in his success of fishing. Bennie’s actions also reflect an integration of knowledge acquired through his own experiences and his understanding of how technologies, in this case the nets, can be interpreted and changed in the process of fishing. On another occasion, Bennie explained to me the importance in keeping personal records of fishing trips that document the unique topography of the seabed in the fishing areas. Throughout his experience as a skipper, Bennie has encountered tenuous situations where his nets have caught on the rocks below the surface. In these instances Bennie described the difficulties in safely removing the net from the rocks and moving the vessel from the area without incurring any additional damage. The information stored on Bennie’s computer is not information he shares with anyone else or records in the logbook. When I asked him if he shares this information he laughed and told me no, because it is based on his own risk-taking and knowledge as a skipper, and only through your own experience and chances would you acquire that knowledge. He has lost nets and severely damaged trawl doors in different instances, but he is determined that these experiences contribute to the formation of a successful Namibian skipper.

Concluding Remarks

The visible socio-economic network that emerges out of advanced use of technologies in the trawl sector indicates both scale and cost of operations in the industry. The sheer amount of investment in the vessel, crew, gear and technology become politicised in the overall structures of economics that guide the industry. Their ability to respond quickly while out at sea and determine where they should be fishing is directly linked to their personal well-being. On the other hand, rapid extraction at the commercial level also affects the potential recovery and sustainability of the resources. With the integration of knowledge, skippers orchestrate each fishing trip in a way that encapsulates the different modes of mediation. Technologies, personal relationships, the fish, the gear, and essentially the atmosphere of activity while at sea, all speak to each other through the interconnected links. Interpretation, perceptions, and knowledge are all crucial elements in the network of interactions that occur.

Chapter 2

Contested Economies: Negotiating the Global System of Exchange and Re-thinking Capital

My first solo trip to the fishery was on a windy afternoon. It was a week day and I rode my newly purchased bicycle through town, thinking how the wide streets were perfect for bicycling but laughing because I was sure the city wasn't thinking bike lanes when they tarred the roads. I followed a route that would become my routine route to the fishery, opting to travel on less busy residential streets until I came to an intersection where I had to follow the main road to the industrial section of town. Bakkies sped along, often with groups of men crowded in the back, and I tried to smile politely as I pedalled against the wind, sand blasting me in the face. I quickly learned to cycle with my mouth shut, as grinding sand in your teeth is most unpleasant. The road to the fishery crosses a set of railroad tracks and then continues up a slight incline before curving around to a long stretch of road, my first association being that if there is 'Greek Row' on college campuses in the United States, this is 'Fisheries Row' in Walvis Bay. Struggling against the wind and sand I came around the curve and was blasted with a terrible smell. As I inhaled the sharp mixture of rotten fish, soot, and exhaust fumes I did not know whether sand in my mouth was a better option than breathing this terrible odour through my nose. I pedalled onward, passing women cooking over fires in the open space along the road, men in work suits walking along the sidewalk, and the occasional other brave soul on a bicycle. I passed the gates to different companies, security guards observing the activity on the road, pacing behind the high metal bars. I was looking carefully at each gate I passed, looking for Seawork, the first company I had arranged a meeting with. Almost at the end of the road, I finally saw the huge sign with the Seawork logo and names of directors and managers. I turned into the entrance and spoke with the security guard and was directed down toward the jetty. I entered the offices and waited in the small reception area to speak with the operations manager. My meeting was brief, and at the end of the conversation I had a meeting with the shore skipper who would hopefully be able to

arrange a time for me to meet with skippers and crewmembers. In the meeting, I noticed the expansive view that the manager had of the entire jetty. His window was large and faced directly over the jetty, a group of men were using a crane to remove a large piece of rusty metal onto to the dock. There was banging and yells, and the shadow of this unidentifiable piece of metal swinging in my periphery. I couldn't help but notice the way that this man had a perfect view, a panopticon vision (Foucault 1977), of the activities on the deck. This was my first indication of the dynamics between the business aspect and the ground level activities. Here, as I passed along the outskirts of the township, the proximity of the poorest area of Walvis Bay is juxtaposed with the fishery and I realised this proximity is not coincidental. While the companies employ a predominately Namibian workforce, many reside in the township and therefore live within walking distance to the fishery. In other areas of the town, one could go days without having any indication that the fishery operates there as it is situated strategically.

This chapter explores the perceptions of capital in the context of one trawling vessel, the Harvest Nicola, using hake as the point of departure in analysing its transformation from the ocean, onboard the vessel, and as it is prepared for distribution. I argue that there are three distinct levels of capital: the company that holds the fishing rights and quota allocations along with the assets of vessels, gear, and technologies that also caters to the global markets; the vessel itself, in this research the Harvest Nicola, consisting of the skipper, crewmembers, the social networks between skippers, the relationships between the skipper and the company, trust and loyalty between skippers, and the company's investment in the knowledges and relationships of the skipper; lastly the capital visible inside the vessel itself while at sea, the relationships and roles of the crewmembers and skippers, specialised knowledges interlinking the different components of the vessel such as the engineers, fish factory workers, and the bosun, all contribute to the overall success of the fishing trip. Through these different levels of capital, knowledges emerge as dynamic elements within the sector and speak to the ways in which economics are enmeshed in social relationships. A network of capital expands the notion of the commodity to include the mediators and linkages of the transformation of the hake. The skipper and crew constantly negotiate their way to successfully finding the fish. It is as much about the goal of filling up the vessel to capacity with fish as it is about the dependent relationship between the fish and the livelihoods of the crew. The crew works on commission basis and therefore the amount of fish they catch directly links to their salaries. The dependence upon this goal is profound as it directly affects the fishers' income and emphasises their interactions with the environment and

the complexity of political ecology. As Escobar remarks, “the regime we know best is capitalist nature, which emerged in post-Renaissance Europe and crystallized with capitalism and the advent of the modern epistemic order in the late 18th century. A number of its aspects [are] new ways of seeing, rationality, governmentality, and the commodification of nature linked to capitalist modernity,” (Escobar 1999:6). Here, modern capitalism is contested in a way that speaks to the fluidity of social-ecological processes that link commodities, labour, production, markets, and knowledge, and drives the management initiatives. The complexity of the hake sector and the fishery as a network of capital(s), further compels the framing of a political ecology in understanding the interlinked levels of capital within the industry.

The interactions between people, fish, technology and governance are each part of a complex network of relationships and exchange. Nature is commoditised within the fishing industry as seen in costs of fishing permits, quotas, and the price of fish on the market. It is also politicised through the enactment of fishing policies aimed at maintaining plentiful resources. Assumptions of the objectivity of nature, existing apart from social processes poses serious concerns for the practical implementation of conservation initiatives. Nature is enmeshed in a space fuelled by politics, capital, and exchange, yet as Escobar (1999) notes, “most of the attention of those seeking to understand capitalist nature has been occupied by the examination of nature as commodity. The articulation of biology and history in capitalist nature takes the primary form of the commodity, and analyses at this level have aimed at explaining the production of nature as commodity through the mediation of labour. From Marxist perspective the separation of nature and society is seen as ideological; the unity of capital entails the fusion of use value and exchange value in the production of nature,” (Escobar 1999:6). Rather than perceiving nature as a commodity, something that can be produced, given value, and exchanged, this chapter seeks to re-think the notion of capital as commodity and show the enmeshment of capital through the social and political processes that synthesise political ecology.

The question of “where are the fish” was asked repeatedly for the duration of the fishing trips I went on and it is through the intricate flow of knowledge, technologies and experience that result fish are found. The location of the fish is uncertain but through the many techniques at use between technologies, other skippers and a cohesive crew, the skipper provides a basis for tracing the hake as it moves and engages with subsequent actors in multiple networks. While the question of where the

fish are seems simplistic, it is an important starting point in understanding this sector of fishing and determines successful fishing trips. As the fish move from the sea, into the net, onto the deck, into the processing factory, into the hold, onto land-based processing, and finally onto the market and eventually landing on a dinner plate, there are a number of factors that are considered throughout this relatively quick process, some of which are not quantifiable through standardised economic values and assumptions. The visible network requires a re-thinking of historical notions of capital and moves beyond the structural framing of productivity, efficiency and value.

The Role of Economics in the Hake Sub-sector: Local – Global Tensions

The role of economics in the hake sub-sector gear towards free market ideals and globalisation that prompts the local Namibian economic system toward a 'modern' system of exchange and a position within the global markets. Capitalism in the context of the Namibian fishing industry favours maximum profitability with minimal costs of operations and points to the trawl sector specifically because of these reasons. Comparatively, studies done along the east coast of Canada reflect that "studying knowledge production and change in these fisheries provides an opportunity to explore local knowledge creation and development and their relationship to conservation and management where fishing as a livelihood is tightly woven into the social, cultural, and economic fabric of the community, yet where heterogeneous fisheries have become increasingly market-driven, technologically intense, 'scientifically managed,' capital intensive, and are operating in the context of dramatic and rapid ecological change," (Murray et al 2006:203). The Namibian fishing industry resonates along a similar spectrum of commercial fishing and the impacts this has in various sectors of social life.

Economic semiotics, or the ways in which economic trends and fluctuations are read and responded to, influence the fishing activities most prevalently at the ground level. Since the majority of hake is exported, the capital exchanges solidify the systems of economic mobility trans-nationally and illuminate the prominence of intensely capitalistic flows of resources and commodities. As Hornborg argues (2004), there is also the investment in human labour and natural resources that transform into material exchange values in the commoditisation of nature. In my conversations with skippers, they express a comfortable confidence in their knowledge as to where to find the fish that

the company desires. They stated that if the company wants smaller, softer hake they will fish in the south and if they want larger, firmer hake they will fish in the north. Each skipper has knowledge of this and I sensed that it is common information. The ability to narrow down the fishing grounds based on the type of hake desired speaks to the linkages in market demands at the global level as the consumer(s) are in a different area of the world such as Spain or the USA. The company capitalises on the skippers' own work and knowledge, as they are keenly aware of the skippers' ability to find the fish that the market demands. The global market for hake is dependent upon the particular ways of fishing in Namibia, and the cost of the final product also centres on the type of fishing that occurs. On my second day in Walvis Bay, I sat in on a meeting where the manager discussed the current trends and fluctuations of the hake market in Europe and the steps his company was taking to appeal to them. He explained that trawling required less costs overall to operate and therefore his long-line vessels were only going out occasionally. Hake caught through long-lining is bigger, firmer and generally higher quality due to it not being caught in a net. Hake caught this way is packed whole, with little processing done and then shipped off right away, reaching its destination within less than a week. However, he stated that due to the economic recession in Europe, the type of hake in demand is changing. Instead of the more expensive, fresh, whole hake that is bought in a fish market, the demand is increasing for smaller, pre-cut, hake fillets that are less expensive and can be purchased at the local supermarket. Therefore, in the interests of the company and keeping costs at a minimum, trawling vessels continue to fish regularly and the long-lining vessels only on occasion. Thus, my own fieldwork focuses on the trawling sector, as they were the majority of vessels fishing at the time I was in Walvis Bay. The global markets for hake in Europe, South Africa, and the United States impact the fishing operations at the ground level in Namibia and companies tread carefully how they balance their cost of operations. The operations must cater to these foreign markets that begs the question of the prominence of hake products on the Namibian markets. As the country only has two million people, the local market is minimal. With the revision of the MFMR Fisheries Act (1992) fish consumption is encouraged within the country while also as a resource in providing food and fighting poverty. However, Namibia remains one of the most unequal countries in the world and its population polarised (Central Bureau of Statistics [CBS] 2008). Fish consumption in Namibia remains low, and local hake prices are generally too expensive for residents, particularly in rural areas.

The movement of commodities, ideas, languages, services and experiences in the capital intensive hake trawling industry, illuminates the networks of mobility that emerge in the people who work in the sector, the type of fishing that occurs and the intersection of local and global politics. Gone are the fishing days of the past where there were no standardised regulation policies and fishers were able to simply cast their nets into the ocean. The abundance of fish and the quality of fishing are now a distant memory as the global fishing practices continue to accelerate. However, this is not to describe the present fishing conditions in oppositional terms from the past, but rather to examine the hake trawl sector as it functions today. The current state of the fishery shows the shift to global fishing practices and responses within the industry to sustain a profitable business. Considerations to the economic implications of extraction are integral to the progression of effective and appropriate management. Management also threads the political fabric of the industrial fishing enterprise at the local and global levels in attempts to provide policy infrastructure that incorporates maximised benefits for Namibia mainly through onshore developments (MFMR 1993). While the policies instituted after Independence specifically seek to incorporate more Namibian presence in the sector, fishing rights and quota allocations remain in control of the companies. Skippers, crewmembers, factory workers, deckhands, and engineers are all part of the big-business ventures at the corporate level. Skippers are the link between activities at sea and the company onshore and their role requires careful navigation of their fishing knowledge and experience coupled with the understanding of market fluctuations and company demands. Capitalism requires differential representation in power and politics, fostering inequity through hierarchies and competing interests and inequality through the workings of a profit-seeking system. This system then has the means to include and exclude various groups of individuals and parties in marginal positions as seen in the example of how the fishery is setup, with the corporate entities protected and gated on one side, and the township on the other. The stark contrast in this setup reflects disconnects in how profits from big-business may be asymmetrically distributed. Fisheries Row exemplifies capital, assets, global markets, and maximum profitability, and Kuisebmond township the unequal distribution and continuous struggle for well-being at the local level.

Re-thinking 'Capital' on the Harvest Nicola: The Floating Community

Through my experience onboard the Harvest Nicola, it is possible to trace the relationships

that connect people, experience, language, and roles. I began to see the vessel as a "floating community," echoing similar research in occupational studies and human organisation (see Barth1966, Power 2005). The domain of capital in this context refers to the enmeshment of resources, individuals, and markets that shift and mobilise across spaces and boundaries. Perceptions of capital expand and include social networks and ties, loyalty, trust and alliance, all of which contribute to the success of the fishing trip.

The fishing trip is successful first and foremost because of strong relationships and a productive working environment that requires contribution from all crewmembers. As a collective, they negotiate elements on their peripheral such as other vessels, the sea, the weather and most importantly the hake. The intricacies of these networks that fluctuate with each movement and each trawl and demonstrate the ways in which the floating community sustains itself in this context. On the first fishing trip I sailed on I noticed the ease at which the group performed their duties and the fluidity and understanding of each individual involved. The cohesiveness was apparent in the efficiency at which the nets were shot and hauled in, the clean movements of the crew as the winches pulled in the net and the stray catch was removed. It was clearly an efficient and utilitarian process that they had mastered. Each person knew exactly what they were supposed to be doing and executed their role with a confident effort. The result was rapid pick-ups and shoots. This ultimately meant more time was available to fish and therefore the expectation that more fish could be caught. The bosun was clearly knowledgeable in his role of making sure that the other crew members were properly fulfilling their duties, making sure the nets were not tangled and repairing damages or issues to the equipment and gear.

In stark contrast to this fluid efficiency stood the second trip I sailed on. On this trip the bosun was on leave. The disjunctions that occurred on this trip were profound and the social tensions and overall functionality of the vessel was strained. The trawl doors were tangled on multiple occasions when the nets were hauled in, causing a delay in securing the trawl doors on the vessel and releasing them from the nets so they could be hauled onto the deck. Therefore, the skipper had to release them back into the water so they could be re-assembled in the correct position. When this happened the second time the skipper's body language was rigid and furious, he went out onto the top deck and yelled down at the crewmembers, shouting in Afrikaans what I can only imagine were curse

words and frustration. As this happened again the skipper stormed down to the bottom deck yelling and demonstrating himself how to avoid the tangled doors. The winch man, who has to rely on hand signals and voice commands from a different position on the vessel misread these signals thus resulting in the net being hauled in at the wrong speed that meant catch being lost in the nets as they were reeled up. On the first trip the bosun had given the winch man and skipper hand signals from the deck, raising his arm when the skipper needed to stop the nets so debris could be cleared out, and an up and down hand motion to the winch man indicating he should lift the net and drop it down, further clearing out the net. In the absence of the bosun to translate the activities on deck to the winch man and skipper on the bridge, multiple crewmembers on deck were giving signals and thus resulting in confusion and miscommunications. There were close instances where the net was almost dropped down on top of one of the crewmembers and also the ease with which the net was cleared out was irregular. As the net was being pulled in, Don had to stop and re-release the net so that the buoys could be placed properly and not get caught in the cables. The frustration that the skipper expressed evoked tensions in all areas of the vessel, myself included. If there is an issue with the gear and the operational efficiency, it sets off a reactionary occurrence that stalls the entire process of fishing. If time is money, the skipper is acutely aware of the potential and importance of each trawl. When something goes wrong, all individuals on the vessel face the repercussions. The tension and anxiety in Don heightened when there was an interruption in the flow of activity on deck. He started smoking cigarettes if there was tension on the vessel and during the first trip I did not see him smoke, but on the second trip he was chain smoking. Don's tone of voice and his movement from the bridge down onto the deck to assess the position of the trawl door or the tangled net indicated to me that this was a serious issue. Bennie, another skipper, described to me the importance of having a productive and efficient crew and vessel in that, "We've got people that's working permanently in the factory, people working permanently in the hold for packing the fish with the ice. This one connection or something, if everything is gone, basically, it's from top to bottom. If there is one mistake going on the bottom of the hold or something then the mistake starts going up to the factory and the factory must stop and the deckhands can't do work we can't pick up the trawl so it's basically like a chain reaction." The cohesion of the crew is optimal for a successful fishing trip and therefore crews are preferred to work together for contracted periods, hired for a permanent position to keep the groups intact. The skippers also prefer their crews to be familiar with each other as it adds depth to their working environment. Don treated Uillika like a daughter, a family member he would teach, but also joke and share stories

with thus establishing solid communications with.

Photo 2a: Crew preparing nets on the Harvest Nicola June 2010 (K. Draper)

As the fishing trip commences, the visibility of capital(s) mobilise within a larger network that emphasises the relations and interactions onboard. The networks expand as the skipper draws on his experience and relationships while at sea. Each individual that goes on the trip embodies a certain level of capital in their experience and the specific skills they are expert in. Each crewmember becomes a core component in their position on the vessel and their human capital is an important element when entering the sector and being hired by the company. As described in the previous chapter, there is a tight-knit working attitude between the crewmembers. They often work together as a collective on a specific vessel rather than being hired from different companies for different trips. They are familiar and comfortable with each other and interact at a level that is friendly and relatable. This highlights an element of cohesiveness and ability for individuals to

establish themselves within their work. The ability to work efficiently and cohesively demonstrates a network of specialised skills and experience that must function in order to successfully catch hake.

Specialised crewmembers such as the skipper, engineers, greasers and fish factory workers inhabit a slightly different space in that their work is more specific and they are trusted to be expert in their roles. Their responsibility is to be efficient and knowledgeable in a particular aspect of the overall network of functionality. The element of trust is an important aspect of solidifying certain networks and mobility within the community on the vessel, the company and the industry as a whole. Trust, seen in this context as the strength, ability and/or reliability of someone or something becomes an important basis for establishing a robust space for negotiation and ultimately successful fishing. The area where this was most visible was between the social relationships and structure of the members on the vessel, between the floating community and the company and between different vessels of different companies out on the water.

The Harvest Nicola is comprised of twenty-three crewmembers, including the officers and skipper. The very structure of the vessel emphasises the element of community and hierarchy that reflect the assets that each individual contends in their role on the vessel. The skipper maintains his position on the bridge, where he has access to the necessary tools to guide the vessel. Guidance in this sense refers to the meanings associated with the term skipper. The skipper is the highest-ranking officer on the vessel and reflects a distinct power hierarchy that is also represented clearly in the physical structure of the vessel. The highest ranking officers and skipper have accommodation on the bridge, private bunks and more ample space than the deckhands on the main deck level who sleep two or four to a cabin and share lavatory facilities. Onboard the Harvest Nicola there is also a cabin below deck, mainly for the onboard factory workers and deckhands and they share one cabin with two sets of bunk beds stacked three high. Space and place are interlinked here and further compound the social structures at hand. The skipper occupies the space at the top of the vessel where he is able to see and hear activity on deck, the deckhands' cabins are located in close proximity to their work space, and the cabin below deck is adjacent to the fish factory, strategically housing workers there. The skipper maintains his position on the bridge with his own cabin, and rarely moves beyond this space, whereas crew are on deck level and below deck level, and permission to the bridge area is only allowed for specific reasons, such as cleaning or entering data into the logbooks.

The particular ways in which the vessel is organised, who is allowed on which areas of the vessel, the everyday duties that are required of crew (daily routines of cleaning and maintenance) further affirms the notion of a communal enterprise.

The relationships between the skipper and his crew are perhaps the most important network that emerges within this context. I was fortunate to be able to go out to sea on three different occasions, with the same crew and vessel that allowed me to gain an insightful understanding of the social networks of capital and rapport that are established on the vessel. Each trip was different and uncertain, and the challenges posed required quick thinking and action. As I became more comfortable with my place on the vessel and was introduced to different crewmembers and settled into a routine each day, I became part of the community onboard, occupying a unique space of researcher, friend, woman, and observer. Because I had no specific role other than talking to the skipper, officers, and observing the fishing, I was able to move amongst the deck levels, the bridge, and the factory. During pick-ups my presence was expected and if I happened to be in my cabin, the kitchen or outside, someone would come find me and let me know. Don teased me about sitting outside in the sun, saying he also enjoyed watching the sea but from his position inside. The importance of a cohesive group of individuals working together in a small space, each with particular roles and responsibilities, attests to a collective dependence for success in the work at hand.

When they were not shooting or picking up, the crewmembers stayed in their cabins and rested. Magazines and newspapers circulated throughout the vessel, reading was a common pastime. Meals were served at the same time everyday and during this time there was a rush of activity around the galley area. The crewmembers eat in a separate dining area than the officers and fisheries observers, and the skipper's meal is taken to him on the bridge. Breakfast was served around 06h00 and consisted of porridge or VeetBix, tea or coffee, and toast. I was instructed to eat in the officers' area and great care was taken to provide me with plenty of food and any special requests. Uillika and I were both served eggs with our breakfast, and I had brought my own muesli in place of porridge. Lunch was served around 11h00, and Uillika and I went directly to the galley after her morning shift that ended at lunchtime. For lunch we usually had soup to start, either vegetable or lentils, and the main meal had a starch and protein. Generally, it was rice or pasta salad with meat. I am vegetarian and before I left a friend instructed me to let the cook know this as soon as I met him, which I did, but

told him he did not have to prepare anything additional for me as I had brought some of my own food. I also was aware of how kindly the crew had welcomed me onto their vessel and was prepared to eat my meals with no complaint or expectation of special accommodation. After lunch Uillika would rest until dinner, and I would sit outside on deck if the weather was nice or sit inside and chat with Don. Dinner was served around 17h00 and was similar to the lunch fare. Meals were a time for the crew to spend time together outside of their cabins or working on deck, and I observed laughing, talking, and joking during these times whereas it was relatively quiet onboard otherwise. Food does serve as a way of bringing people together, part of the daily routine that indicated the time of day and usually coincided with the trawls. I noticed in my own schedule the role of mealtimes and what I could expect to happen in the fishing process based on them. A pickup would happen before breakfast and dinner, and shoots, depending on the length of trawls, would happen after breakfast, sometimes before lunch, and after dinner. Onboard, the days are structured, the roles for each individual give rise to feelings of routine.

Loyalty and Alliance

Loyalty and alliance are other important elements in the discussion of capital. I was surprised to learn that loyalty is not bound to specific companies but extend to personal relationships and rapport between skippers from different companies. While we were at sea, Don was in constant communication with the other vessels in the area and utilised his established relationships with those skippers to assist him in successful fishing. The communication and the information shared speak to additional modes of capital that link to the network of social relations and their contribution while at sea. The skipper makes use of his relations with other skippers so that he may ultimately fish in an area that yields high results. All of the skippers that I conversed with spoke of the importance of seeing other vessels in the fishing area, as this is an indicator that there are fish there. Compounded with loyalty is trust in the information that is received and extended, as all the vessels have the same goal of finding the fish and filling up quickly. Vernon explained to me that, “the best bet is to go where the vessels are. Because normally where the vessels are there are fish. You know, where the vessels are uhh, basically you know in Walvis Bay there is a lot of vessels uh trawling vessels so basically a lot of them are locals so they talk to each other. So normally when there’s fish, this one call that one that one call that one this one tell this one don’t tell that one but he tell the other one, and

so they go on like a circle no? So everybody's now at this one, this place like maybe ten or twelve is is is like in the 22 degrees ten, twelve is like in the sixteen degrees so a lot of them are scattered all over the place. So, you now you know now okay a lot of them are there so when you go there you will find them there. So you know okay there there is fish."

The levels of trust that skippers share with each other emerge from their experiences while out at sea. Skippers establish relationships through an investment in the advice from other skippers of where to fish or if they know where the quality fishing grounds are. Relying on information shared through these networks is risky, and they invest not only their time and effort into that knowledge but also the crews' and the company's. The company's influence helps shape the social networks that the skipper must negotiate and business practices utilise the skippers' knowledge and relationships to inform their activity at sea. The opposite is also true, and trust is also betrayed such as the instance where Vernon shared an incident where he though he had a solid relationship with another skipper and took his advice on where to fish only to find out that he had been lied to. Vernon explained, "the guy was my friend but uh, in the fishing industry the people is all about making money and they are lying to each other. Lying like, like in your face lying to each other. It's all about the money all about the fish. So if I can catch more fish you than you so that the company they gonna like me more. Because I can catch more fish because I am the better one. Looking for names from the south to be higher in the rank, ne? So I am the best, I make three, four days while you make seven, eight days. So uhhh anything I ask they will give me because I am the best I catch more fish. It's all about, it's all about that. Looking for a name for yourself in the company." Vernon was not talking with this skipper because he feels betrayed by the (mis)information he received and the personal effect this had on his performance. The pressures of the big-business economics from the company to catch quickly and land quality hake speaks to the ways skippers gauge their status and performance while at sea and encourage constant negotiations between all skippers when they fish. Vernon's frustrating experience cost him time, fuel, income and as he explains, threatened his image within the company hierarchy. Loyalty and trust are embedded in value that extends beyond an abstract notion of alliance but has real life consequences that the skippers must negotiate in a pragmatic manner. More significantly, the company recognises the potential of how a skipper negotiates these social networks out at sea and harness the advantages of these established relationships in the recognition of successful vessels, constantly comparing each vessels' success and the amount of fish landed.

The social relationships between a skipper and his crew along with other skippers, affirms friendship, trust, loyalty, and respect. While the vessels, gear, technologies, and desired product are the same, each vessel is unique in the way they fish. The differences stem from the social infrastructure onboard and the strategies of communication the skipper uses. Don was always in communication with other vessels in the area, even if just to chat or laugh, and he seemed to have friendly relationships with all those he spoke with over the radio. Additionally, Don is friendly with another company's trawl vessels because his sister is married to one of their skippers. Our vessel was in close proximity to vessels from this company for a substantial portion of the fishing trip and communication was strong and consistent on the radios between vessels. Communication was both at a professional level through discussions of fishing conditions, weather, how much each vessel was landing but also for relaxation and leisure through singing songs to each other, telling jokes and discussing the results of the latest World Cup soccer game. These skippers have a personal history and an interest in keeping their relations cordial and helpful, in hopes that the information that they may share will be returned and they can sustain a comfortable social network in which they are able to fish efficiently and successfully.

The notion of social relationships as capital also speaks against the notion of the 'fishing machine' and automatic fishing practices. Skippers have an extensive knowledge system of skill and expertise that includes his ability to interpret the information from other skippers while at sea. Knowing whom to trust and acting prudently while at sea demonstrates a quality skipper and is an area that the company also benefits from. The company is aware of the skippers' ability to access information while at sea through these relations and in turn, recognise it as part of a quality skipper. In order to successfully find the fish, the skipper must first work through his network of knowledge and experience that forms an integral element in the fishing process. This again contests the notion of the fishing machine as these social relationships are part of the skipper's knowledge system and contribute to his success as a skipper. Without these experiences and relationships the skipper would not know how to interpret the information coming to him at sea, who to trust, or where the quality fishing grounds are. A fishing machine does not incorporate these specific relationships and therefore assumes mere technologies can achieve the same goals, which these examples reject, revealing a

much more integrated system of knowledge an capital.

Networks of Capital(s): Language, Knowledge, and Experience

Knowledge also forms part of the network of capital and is visible through the company's investments in the skipper's knowledge system and experience, and the crew's ability to work together and manage the vessel to obtain the product desired. The company invests in the technology, gear and vessel, that provide the tools for fishing do not guarantee fish. Only through the skippers' network of capital and relations with his crew and while at sea, does successful fishing occur. Language is an essential element in the construction of relations between individuals, thus the role of language and communication is a important contribution to the exchange system within the hake sector. Here, exchanges occur at various levels and between various parties such as advice on where the fish are from another skipper at sea or how to solve a technological problem. Ultimately, the social exchange of information and experience translate into (un)successful fishing and therefore link directly to the income of the skipper and crew. Language is also a mediator and link that allows certain processes to be understood and to distinguish certain elements of the human-environment relationship. In the process of fishing, the practical knowledge is visible in the acts of shooting the net, picking up and steering the vessel. In order to keep a fluid working environment, language is part of the knowledge system. The skipper communicates with his crew, the company and other vessels in the area and often benefits from the signs that came across the wires. Sharing information and the ability to interpret the network of knowledge in a particular moment is vital to the success of the fishing trip. When asked about the importance of communication, skippers emphasise the necessity to be in communication with as many other vessels as possible. Through the sharing of knowledge about each vessel's experience, the skippers are able to interpret those signs in a way that informs and helps determine how they proceed in their own fishing trip. Also, by communicating with multiple vessels the skipper has an advantage in determining if the information shared is valid. Here, language is not only a practical tool in gaining information about others' experiences and successes (or failures) but also represents an intricate network of social relations, that demonstrates how individuals in the hake sector negotiate affective relations as they fish at the industrial level.

Photo 2b: Catch mid-day, the Harvest Nicola June 2010 (K. Draper)

Concluding Remarks

What emerges from this analysis is an example of shifts in scale of operations and markets, but also the commoditisation of nature itself as extraction continues at capital-intensive levels. Focusing on extraction processes and markets does not fulfil a complete understanding of the historical trajectory of political ecology and the ways that nature itself has been constructed and defined through various ideological frameworks. Ultimately, the networks of capital, the socio-technological assemblages and the reality of global fish harvesting all contribute to the state of the fishery in the present moment. Expanding the notion of capital speaks to how environmental management and conservation poses solutions to the disconnects in policies, framed around interlinkages of social, economic, biological, and technological spaces.

Chapter 3

"Namibianisation" and EAF: Knowledge, Ethos and Policy in the Hake Sector

"I've been in the fishing industry for a long, long time. I am a Namibian and this is my home. I've always been fishing here in these waters so I know the area. Namibians, we know how to fish here because this is our home." - Don 2010.

While the historicity of the Namibian fishing industry reflects visible foreign influences namely from South Africa and Europe, there is a distinct Namibian fishing ethos that manifests in the knowledge, experiences and practices that are embodied in Namibian fishing identity. Ethos here refers to the unique ways that Namibian skippers and fishers have experientially come to known the fishing environment and the history of knowledge and experience they use when at sea. Because many of the skippers have been working in the industry for years, they have acquired specific knowledge in regard to the topography of the ocean floor, weather patterns, and patterns in fish behaviour that contribute to their success in catches. Through material semiotics, the skippers have acquired localised knowledge that assists in their interpretation of signs at sea. As Palsson notes, skippers' knowledge is complex because they are often guided "more by practical results than by an interest in theoretical advancement," (2006:80). Further, the skippers' knowledge and decision-making is based on "serial accumulation of detailed environmental information," that is assembled through "the ability to recognize and apply an array of minute but relevant details," (Palsson 2006:81). Don's experience of life as a skipper encapsulates a deep affinity for the natural environment in which he works. He has a lifetime of practical knowledge of the sea, and is particularly fond of life on the open water. Being out at sea is isolated for the skipper, and after only eight days I found myself feeling disconnected from the outside world. For Don, he cherishes the solitary lifestyle of fishing and he expressed his affinity by having me stand right at the front of the boat, looking out at the sea in all directions and saying, "this is what it's all about. This is why I fish. The open sea and not knowing what each day will be like." Notions of place and identity are strong topics of importance in my conversations with Namibian skippers and they expressed the strength of their knowledge and expertise in relation to ties to the country. Their personal histories show great depth in the experiential learning and spoke to specific elements of fishing in this area of the world.

Palsson (1994) describes how in the Icelandic fishing industry, the notion of finding one's sea legs is a stepping stone at the heart of fishers' experiences. In those moments of clarity and sense of purpose in their trade, the fisher's embody their environment through the work they do. It is this experiential process that defines the Namibian fishing ethos, and for skippers, who spend more time at sea than they do on land, defines their identity as Namibian fishers. This chapter explores the experiences of both Don and Uillika, each with a unique personal history in the fishing industry, and the ways in which the emergent Namibian fishing ethos speaks to Namibianisation policy as well as EAF, pointing to gaps and mismatches and offering suggestions as to how to re-evaluate EAF policies.

Uillika has been working in the fishing industry for about four years. She initially answered an advertisement in the local newspaper seeking sea couriers for freight vessels. The money is decent and she felt a desire to travel beyond the town where she was born and raised. Once into the world of seafaring, she was able to capitalise on other opportunities that eventually landed her the position she has now, as a second officer in command on a commercial trawling vessel. I learned of her family back in Oshakati, the remittances she provided, and her desire to one day become a skipper, although she did not want to spend a lifetime in fishing. Through many late night and early morning conversations, (her nightly duties were 18h00-23h00 and 05h00-10h00), I got to know her as a friend, casually introduced within a context dominated by men, but quickly solidifying a relationship on those quiet, rocking shifts on the ink black sea. Her entry into the fishing industry is interesting in the ways it speaks to the influence of the fishing industry and the intersections of a Namibian woman working within the sector. My field research was heavily structured around conversations with male skippers and managers. In the trawl sector, the majority of seagoing staff is men. Uillika holds a unique place on the Harvest Nicola as she is an officer, and she spoke of her position with pride and comfort. When I asked her if she ever felt uncomfortable working as the only woman onboard, and if the company respected her as woman in this position she laughed and said of course they do. She exudes a certain confidence, and while young in age, her eagerness to do well and succeed in the fishing industry has certainly allowed for quick progression through the ranks. Her quick mobility within the ranks of the vessel is attributed to multiple factors. Unlike her male counterparts, she did not have to spend time as a deckhand, as it is hard physical labour and a "man's work. No, I never had to work on deck!" Furthermore, she took initiative with learning the technological skills and breezed through the courses and exams on her steps to attaining skipper status. Also, the company agreed to pay for her course fees so that she continues to earn her skipper tickets. In this sense, she is

valued within the company and from the way she interacted with the skipper and crew, she had distinguished herself as a respected officer on the vessel.

I got to know Uillika quickly and cordially as we shared her small cabin on the Harvest Nicola. The cabin had two bunk beds but barely enough room for both of us to stand, a small desk and closet. As we got to know each other, and we quickly learned to navigate the tiny cabin, offering each other any extra space we could, I was humbled and inspired by this young woman, only a couple of years older than me. The early death of her mother and absence of her father matured her at an early age and with younger siblings, Uillika did as much as she could to provide for her family. My first inclination about the gender dynamic of the fishery was that it would be all men, and therefore I was surprised to hear that I would be bunking with a woman officer. I understood that a special request would have to be made for a female observer so that we could share a cabin, or that crew members would have to move to other cabins to allow a space for me. Although I was assured that accommodation would be provided I was concerned because I did not want to be a burden or cause unnecessary discomfort. To my surprise and delight however, the Harvest Nicola had a female officer who was willing to share her cabin with me. The logistics of sleeping arrangements show the gendered dynamic of fishing, where the crews are generally all male. Despite initiatives to promote gender equality and women to enter the sector, this has been met with challenges in that fishing is considered hard, physical labour, requires time away from home, and therefore women seem sceptical of joining fishing crews. The onshore factories however, have a noticeably higher employment of women. I was able to tour an onshore factory and as I entered the main factory floor, nearly all of the workers along the metal processing tables were women. The predominately female workforce as well as Uillika's story illustrates the results of state policies in favour of gender equality and Namibianisation.

Uillika's story offers insight into how specific elements of fisheries management have shaped her experience in the industry and points to how policy has helped her to sustain a job, income, and place within a corporate enterprise. Her achievements in her position notwithstanding, it is because of Namibianisation policies and gender equality initiatives in the Namibian constitutions that have also contributed to her success. Uillika benefits economically in a work environment that encourages Namibians and women into the sector. Unlike Don, who has been fishing since he was a teenager and

comes from a family of fishers, Uillika entered the industry due to the opportunities offered through policies aimed at job creation, gender equality, and Namibianising the sector.

Namibianisation and EAF: Mismatches in Policy and Lived Realities

Although Namibianisation policies are designed to encourage Namibians into the fishing sector and address issues of social inequality and economic stability for the country and it's citizens, the reality is that individuals in the sector are entangled in a much more complex network of socio-political and economic agendas of the companies and the state. The positions of the skippers, crewmembers, and engineers are prioritised in regard to certain elements of the policies, and while Don explained how his company now only has one Spanish skipper rather than the majority when he began working for them, ownership and specialised work remains in foreign control. The implications for this complex network of interactions directly impact the economic stability for the workers and their personal well being, creating and sustaining job security, and the possibility for creating an effective and inclusive management paradigm. The policies implemented in 1992 to shift the significant foreign interest and control of the fishery was the beginning of the processes to encourage Namibian involvement in the industry and an attempt to reconcile the injustices of South African apartheid. Historically, poor fisheries management and rapid extraction speak to "the criticism that Namibia's fishing industry has historically been far too concerned with production and too little focused on the market," (Sherbourne 2007:25). However this seems to be changing due to the promotion of Namibian hake on the markets in greater Europe due to the harsh economic conditions Spain faces today. In some instances, companies are catering to specific niches within the hake market, providing -tailored products targeting specific populations. In other areas marketing to an entirely new area (such as Gendor in the USA) has proved a successful business initiative. Additionally, due to the current environmental climate buzz words such as 'organic,' 'free range,' 'natural,' and 'sustainable' are used to help market and brand certain products and are part and parcel of value-additions while membership of the Marine Stewardship Council (MSC) allows Namibia to brand its products to appeal to more environmentally concerned consumers and subsequently help promote Namibian identity and products (Sherbourne 2007). Hake has historically been favourable on Spanish markets and expanding its market appeal in other areas of the world (Europe, USA and South Africa) continues the local-global interactions.

Although the promotion and encouragement of Namibians into the sector supports the initiatives within the industry, the pressures of corporate business and maximum profitability remain instilled in the activities at sea. In this way, foreign demands continue to inform fishing in Namibia as the majority of the hake is exported. The tensions between the local reality of Namibia as an emerging force in southern Africa and abroad poses challenges in policy that address the concerns of the country while also maintaining economic security through global relationships. Ideally, Namibianisation policies gear towards promotion and participation of Namibians in the sector where the benefits are invested straight back into the country. These goals are achievable through job creation through onshore processing, greater involvement in shareholding and ownership of fishing companies in hopes that the fisheries sector reach to all levels of the country in tangible ways. Namibianisation, is a step in national transformation and reconciliation, addressing the challenges emanating from a turbulent past, and aimed at the previously disadvantaged (Iyambo 2004). Here, economic incentives at the local, national and global level are visible in the network of production, labour, and capital, and contribute to management of the fishery.

As the remaining foreign influences attest, Namibianisation policies have for the most part, been unrealised within the industry. For the company which I worked most closely with, through my conversations with the fleet manager of Cadilu, I learned that the company operates with a 70:30 ratio of Spanish to Namibian share holding. This is an important element in the dynamics of authority vested within the individuals managing large companies. Here, companies are able to manoeuvre government policies through threats of laying off employees, giving them an upper hand in acquiring additional quota. For instance, Cadilu's fish processing factory on land usually operates a night shift, employing a few hundred employees who continue the process during the night as vessels offload at a rapid pace. However, due to the current state of the economic system and the decline in demand for hake in Europe as well as lower quota allocations this year than last, the night factory has not been running. Therefore, those who work the night shift are now out of work indefinitely. This instance raises questions as to the economic and social component of the companies and the impacts that this has on the industry. Job security and creation are integral elements in both the Namibian constitution and EAF, and this example echoes asymmetries at the organizational scale level where "both practice and policy have to take type and scale of organization into account and consider how they may benefit or be inappropriate for producers whose livelihoods depend on resources," (Ommer et al 2007:5). In terms of diplomacy, the confrontation of Namibian involvement and foreign interests

contributes to disconnect in communication within the company. Namibianisation policies have been effective in encouraging Namibians to be active in the development of the fishery and the current operations of the fishery as a whole as seen in Uillika's story. What is problematic in this instance is that there are gaps in the networks of communication and statistics on paper do not fully represent the daily operations and activities on the ground. In practicality this would mean greater oversight in policy that secures the rights of the workers, continued solidarity of the fisher's union to address issues and concerns that can be taken to the MFMR, and restrictions of companies in exploiting labour.

The crews in the hake sector today are distinctly Namibian, I did not encounter a non-Namibian crew member whereas the nationality of skippers and officers varies from company to company; in the two companies I worked with all officers were Namibian with the exception of one Spanish skipper working for Cadilu Fishing Co. The factories also employ a predominately Namibian work force. The complexity arises within the structure of the companies and the division of ownership and managerial status between the shareholders involved with each company. The trend here points to more foreign presence in ownership and shareholding, while crews and factory workers comprise a majority of local employment. However, there were individuals I spoke with who were foreigners and hired as specialised employees, mainly due to their familiarity and experience with certain technologies. Onboard the Harvest Nicola, the chief engineer was Polish and his position is integral in successful fishing. He maintains the function of the electrical equipment, engines, and trawling gear, responsible for any hiccups throughout the trip. Within the same company I also met a Spanish employee who is called the 'net-master.' His job requires attention to all problems and repairs of the nets, and the fleet manager explained his expertise in this specific area. The nets, trawl doors, and electronics are imported from Europe and his training had also been in Europe. Thus, he is the link between the site of production of the gear and the use of it on the bottom of the Namibian sea. Therefore, if a problem arises, he able to attend to it thus saving the company time and money, which would otherwise be spent shipping the gear abroad for repairs or having brand new equipment purchased and shipped from Europe. Both the chief engineer and the 'net-master' spoke broken English and Afrikaans and held specialised and solo positions. Onboard the Harvest Nicola, the chief engineer works with a young Namibian engineer, who entered the fishing industry for financial reasons, as he was unable to find work in a different sector. He expressed to me his distaste for life at

sea and while he has training and knowledge in electrical engineering and therefore skilled in his position on the vessel, he is currently looking for work elsewhere.

Thus, while the implementation of EAF clearly expresses a need to incorporate the human dimension into fisheries management and sustainability, and as a result, individuals within the industry are entangled within the company's attempts to maximise profits and at the same time comply with the goals of Namibianisation policies. Initially (see Erastus 2002) Namibianisation policies advocated for the transference of skills, particularly from foreign participants in the industry, but this argument is now invalid due to the presence of Namibian skippers who are skilled through their personal experience within the industry. Namibian skippers are therefore fully capable of teaching new entrants into the industry, as in the case of Don and Uillika. Transference of skills in this sense discounts the unique local ways in which Namibian skippers and fishers have acquired and built their knowledge of the environment and fishing practices. As Palsson notes in fisheries studies in Iceland, "according to many skippers the period of apprenticeship is a critical one. It is precisely here, in the role of an apprentice at sea, that the mate learns to attend to the environment *as a skipper*. Working as a mate under the guidance of an experienced skipper gives the novice the opportunity to develop self-confidence and to establish skills at fishing and directing boat and crew," (2006:81). The transference of skills is not one-way, but rather points to a knowledge network where all parties contribute to the navigation of successful fishing.

The linkages within fisheries management and the complex social realities of the coastal community for whom the hake fishery is a major employer, speak to the importance of informed policy-making that considers the most comprehensive effects that will emerge from legislation. Therefore, the disconnect in policy suggests asymmetries in management systems, exemplified through the system of control and regulation that simplifies the practices and experiences. Dialogue across these systems requires the careful translation and communication and a re-distribution of power and knowledge (Johnsen et al 2009). Management paradigms thus control both the natural and social order, perhaps not seeing fully the interconnected relationship present. Specific to the management of people are the ways in which Namibianisation policies have contributed to a complex dynamic in which one's identity and nationality may become conflated and commoditised in terms of social and human capital rather than being harnessed for mobilising sustainability. Not only are skills and experience evaluated in the application and selection of crews, but also whether they are

Namibian or not. The acquisition of fishing rights and quotas also politicises identity in the sense that the MFMR allocates quota based on the promotion of Namibianisation policies, favouring companies with more Namibian involvement. Vessels pay lower quota fees if they are permanently based in Namibia and flying the Namibian flag thus stating the majority presence of Namibian ownership (Sherbourne 2007). Direct linkages between identity and policy reflect the complexity in Namibianisation policies and demonstrate the continued struggle for Namibians to have greater control and access at the corporate level. Sherbourne's (2007) argument focuses on the value creation policy and generating employment opportunities, but there is no Namibian market research done abroad, therefore it is up to foreign decision-making within the companies. Therefore, Namibians are still entangled in decisions from foreign counterparts.

Ethos of Namibian Fishing: Knowledge and Identity

Don spoke passionately about his experiences as a skipper and explained that the reason the Harvest Nicola was the top-performing vessel in the company was due to this experience. As described in the previous chapter, the company's trust in Don as he fished is beneficial for all parties. While at sea, if the trawls did not yield as much fish as he was hoping, he never expressed concern but a confident assurance that they would fill the vessel to capacity. The sister vessel to the Harvest Nicola had a younger skipper and therefore he was still learning, making mistakes, and fishing for money. While Don is in a position where his income is significantly higher than his crew, and therefore could afford lower catch rates and shorter trips, his insistence on successful fishing because of his identity and relationship with Namibia echoes a particular disposition around Namibian fishing culture and the unique responses and engagements that arise from it. Don's approach also discredits the image of the greedy fisherman.

The knowledge of Namibian skippers is rich in history and experience. Embodied notions of spatiality, locality and Namibian identity are points of emphasis and speak to the paradigm shift in fisheries management policy since Independence such as Namibianisation policies, gender equality initiatives, and prioritising previously disadvantaged groups. From my conversations I realised that while skippers spoke fondly of the fishery when they first started years ago, they also expressed how much they enjoy fishing in the conditions offered today. After Independence, Namibia had the benefit to create policies that were aimed directly at the country and how it should manage its resources. In this way, policy implementation is a way to provide meaningful initiatives relevant to

the fishery today. Namibians have been historically excluded from the industry due to the economic, social, and political obstacles faced therefore supporting recognition of the Namibian fishing ethos. I noticed how the skippers and crew spoke about their place within the sector as Namibians and how the industry has changed since Independence. One skipper had started fishing in the long-lining sector, another with his father in the rock lobster sector, and another in the pelagic sector. All of the skippers I met now fish in the trawl sector. Through our discussions, it is apparent how the associations of their identity as fishers transitions with these shifts within the fishery. The points of inquiry between knowledge, experience and management speak to the challenges of appropriate policies that now seek to govern people as well as resources, and where identity is also part of the network of socio-technical capitalisation in the sector. There is a strong sense of purpose and identity as Namibian skippers for the skippers I engaged with that contribute to their success at sea. For many years foreign influence has taken precedence and has been a patronising force in some ways, paying little attention to the impacts in Namibia on Namibians and exemplifies an exploitation of humans within the sector. Namibia has the legislative control of the sector and has the capacity to act prudently in regards to the networks of knowledge, capital and social relations that are present. Vernon described to me what distinguishes Namibian skippers from Spanish skippers is "the environment because you cannot bring in a skipper from Spain to there. You can give him a good vessel, a good net and he cannot, he will not be able to do certain things here you know? But uh, he needs to understand the sea, certain areas and so on. And uh, you know, you can bring somebody now and say okay give him a good bosun and a vessel but at least he needs to have a knowledge also, a knowledge of a skipper and certain areas and so on. Because not everybody can, you know? So, this there is a lot I mean you need to acknowledge if you see a person as a skipper because it's it's it's tough." Vernon's account speaks to the particular knowledge and experience that Namibian skippers have and also points to the notion of monist global harvesting knowledge (GHK) emerging from commercial fishing practices (see Neis et al 2000), illustrating the integration of fishers' knowledge into commercial practices. Vernon and Don both expressed the importance of Namibian skippers because of their knowledge of the sea in the area as well as the topography underwater. These details contribute to the Namibian fishing ethos, one that is location specific and illustrates an understanding and relationship with the Namibian fishing areas.

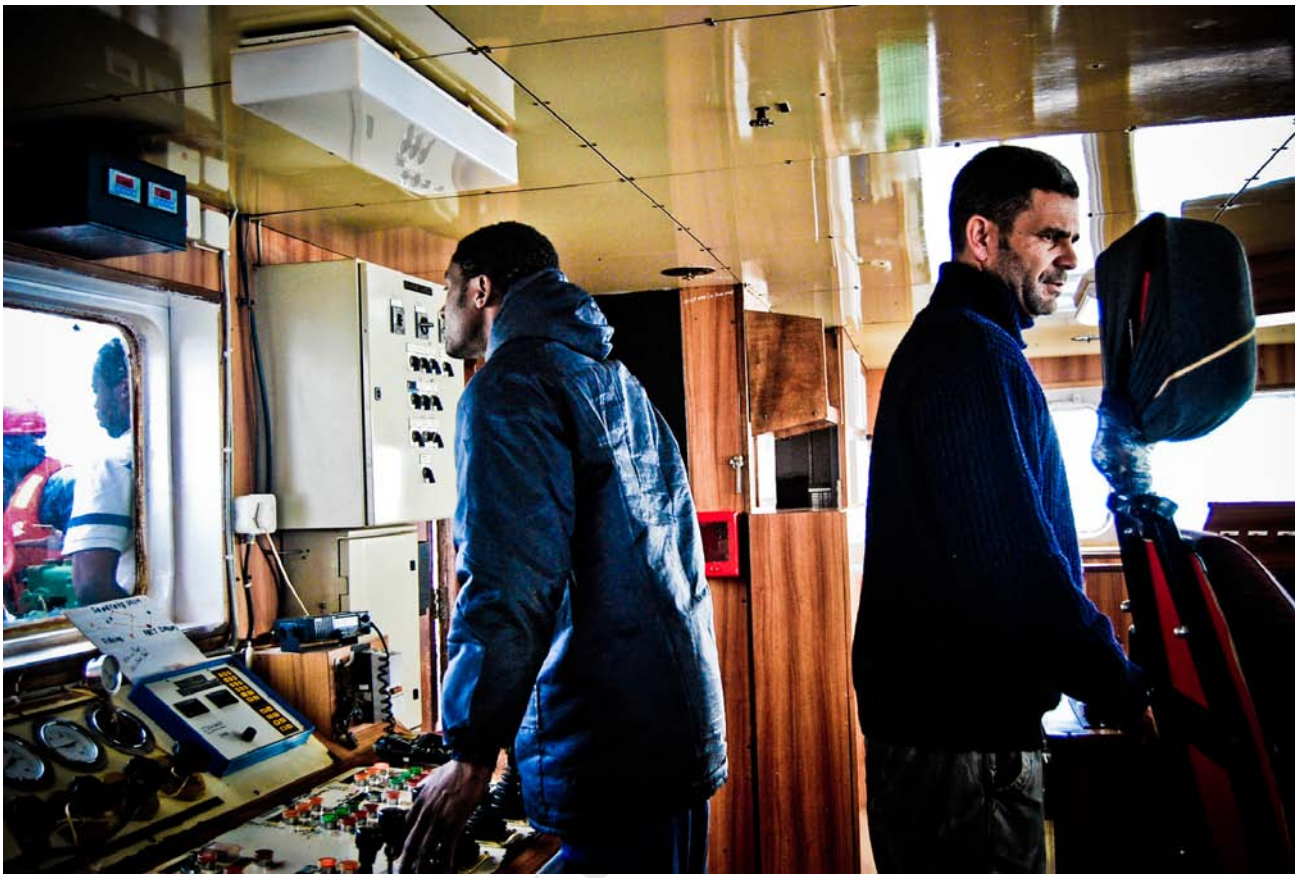

Photo 3a: Skipper Don (right) and first mate on the bridge preparing for pick up. KDraper

Aboard the Harvest Nicola, Don was adamant that Namibian skippers are the most skilled and successful due to their long involvements in the industry and the ways in which knowledge is shared between colleagues. In my observations and conversations with Don and Uillika, I noticed a pronounced relationship between them and in the sharing of information and experience. Don comes from a family of local fishers. He told me that his father had over fifty years of experience at sea in Namibian waters and Don entered the industry formally when he was sixteen. Fishing has been a central element in his daily life and he never considered a different trade, somehow always knowing that he would one day skipper a vessel. He also expressed his own personal will and initiative to establish himself in the industry and reflected a strong individual ambition to work himself into the desired position. While he learned much of his basic fishing skills through mentors and family

members, he pointedly remarked that he did not rely on others to guide him all the way through, but that he had to take that initiative and absorb the trade in his own personal experience and learning. The knowledge emerging from this personal endeavour is ultimately what would open his path to becoming a skipper. This personal journey and continued becoming of a skipper was familiar with Vernon, another skipper I conversed with on many occasions. Vernon is younger than Don, in both age and the number of years since becoming skipper. Vernon also expressed his personal motivations and struggles in entering the fishing industry through his father, a crayfish skipper in Luderitz, to working his way up through the stepping stones of skipper status, now operating his own vessel and crew. In yet another instance, skipper Bennie often takes his young son out to sea with him on fishing trips, allowing him to do work on the deck, cleaning, and learning the ways of fishing alongside his father. Bennie expressed a deep pride and excitement when showing me photos of his son on the last trip they went on, explaining his son's interest and eagerness in learning the work of his father. Thus familial ties and generations of fishers are not uncommon in a commercial fishing industry. This element of ethos is lost in the alleged shift from skilled fisher to fishing machine (Johnsen et al 2009) that was discussed in the previous chapter.

If the Namibianisation policy can be seen as a particular aspect of EAF policy, then both are seeking to re-think models of regulating human activity and the impacts within a socio-ecological system that is a complex, dynamic enterprise. In the EAF framework, the goals and objectives reflect "the broadening of the ecological component from only considering the target stock to including non-target species and ecosystem implications. EAF also requires that management plans give consideration to the social and economic well-being of the industry and broader fishing communities," (Paterson & Petersen 2010:278). It also encourages broadening what we mean by a socio-ecological system and how management may prioritise the varying elements in policy (with the goal to encompass all areas of natural, human, economic intersections). Fisheries management in Namibia is at a crucial and exciting point in which development of infrastructure is solid yet the components of a successful approach are still emerging. New paradigm shifts are including the complex social elements and factors that are actively engaged in the daily operation of the fishery and also extend into the community, municipal and national ventures. The impact of the fishing industry in the overall stability of Namibia is profound. After mining, it is the country's most important resource so careful management and sustainable policies are infinitely significant for the country on a

global scale. Hake as a commodity serves as one of the most important products in the globalised aspect of the Namibian fishing industry (70% is exported overseas). This is an invaluable opportunity for Namibia to establish itself as a model of successful socio-ecological fisheries management via inclusion of a natures-cultures political ecology framework. It also means that there is attention to the progress and implementation of sustainable resource management policies and foreign influence, through the markets, continues to dominate the sector in many ways.

Socio-Ecological Restructuring: Tensions in Sustainability

As described in the previous sections, Namibianisation policies offer varying results for different companies in terms of composition of the workforce. These policies also link to notions of human/social capital, identity and ethos of Namibian fishing. The impacts of these policies and their impacts within the fishery, compels further questions of the role in successful EAF implementation in the Namibian fishery. Drawing from the Coasts Under Stress (CUS) research (2007) as well as my own research, I suggest an analysis of the lived realities of 'socio-ecological restructuring' that offers insight into the asymmetries of national policy and the lives of individuals at work in the industry. The contributors to the CUS research discuss how the lack of understanding of how policies impact local communities leads to policies that direct benefits away from local producers, without easing the risks and uncertainties of a global economy (Ommer et al 2007). This speaks to asymmetries within the Namibianisation policies, pointing to gaps where policy implementation to encourage jobs, economic stability, and food security have still rendered complex linkages between the encouragement to Namibianise the sector with these goals and a distinctly Namibian for Namibians industry that is trying to establish itself within a globalised space. The asymmetries are apparent in the local-global tensions where the producers are the seagoing and factory employees yet the product is sold elsewhere for higher gains. When global markets suffer, as is the case in recent years, the employees are impacted most directly in their salaries and job security while the big business economics of the company manages to consolidate losses and wait for the markets to recover.

The disconnect in Namibianisation policies in theory and what is experienced in the lives of those within the industry is apparent in the analyses of both Sherbourne (2007) and Meyn (2005) where contradictory results show the difficulties in presenting a transparent account of the Namibian composition in the industry. Meyn (2005) concludes that the majority of the fishing industry is fully

Namibian owned yet benefits asymmetrically accrue for Namibians. Through strategic manoeuvring in joint-ventures, re-organisation of ownership and sub-contract agreements, the required 51% Namibian share is achieved and therefore 'Namibianised' status is granted. However, Sherbourne's (2007) analysis concludes that despite the emphasis on Namibianisation policies, there is still large foreign involvement particularly in management and ownership, and indicates, after seventeen years, there are only two fully Namibian companies, Etale and Hangana. Consequently, there are varying degrees to which economic analyses are conducted in the sector and yield starkly different results. In this way, Namibianisation policies would benefit from a review, wherein analysis would re-evaluate not only the sector, but also the flow of capital and assets within the country and abroad. Furthermore, while "fishing quotas are officially neither transferable, nor tradable in order to avoid the market dominance of big companies, some newcomer companies rather use the financial opportunities of entering into an apparent joint-venture with a well established company than developing technical and managerial capabilities to become a real joint-venture partner," (Meyn 2005:15). The capital required to enter the commercial fishing realm is too great for new entrants and therefore ally with already established companies in an apparent joint-venture. The methods of manoeuvring the practicalities of policies such as Namibianisation reflect consistent attention to the needs of the citizens but closer examination also reveals loopholes and gaps in practice. In another example, I sailed on the last trip with the Harvest Nicola in July as they had already reached their quota. As mentioned previously, the company politically manoeuvres their position with government to acquire additional quotas. Cadilu Fishing Co. was denied additional quota allocations from the MFMR therefore they had plans to fish north in Angolan waters. This initiative is based on the company's ties to parties in Angola who sold fishing rights and quota to Cadilu. I was told this was the first time they would be fishing here but they needed to continue fishing as it was only July and renewal of allocations did not begin again until April. This example further emphasises the local and global tensions of big business operations and the ways of moving around policies in Namibia. Shifts in fishing effort enabled through the socio-technical network of global harvesting techniques have unknown effects on the biophysical environment and trans-boundary fish populations. Efforts to manage these shared resources together (i.e. Namibia, Angola and South Africa) are only beginning within the Benguela Current Commission (BCC).

The importance of maintaining livelihoods that are dependent upon time spent at sea and

good catches, is part and parcel of policies that are geared toward controlling both the natural environment and the human dimension. Where is the disruption in the success of EAF implementation that accounts for the corporate human element (more of a network of individuals under the umbrella of the company) and the direct impact that it has in negotiating the human dimensional divisions of labour? This raises important questions around the ways that Namibianisation policies are linked to EAF implementation and also problematises the disjunctions in policy that directly affect the skippers and crew as well as others involved in the sector such as factory workers and administrative employees. Echoing policy failures in South Africa post-apartheid where fisheries reform was intended to re-establish a 'home-grown' structural adjustment programme to aid in the fight against poverty and contribute to coastal community sustainability. As is the case in Namibia, both contexts illuminate the complexity of balancing political, social, economic and biological objectives where transformation through equity and re-distribution contribute to poverty alleviation among previously marginalised and disadvantaged, maintaining a stable and internationally competitive fishing industry while ensuring the biological sustainability of the resources. As is the case in both Namibia and South Africa, however, the fishing industry alone cannot eliminate poverty although it certainly contributes to the livelihoods of coastal communities such as Walvis Bay (Isaacs 2007).

I would suggest that a review of Namibianisation policies would highlight the challenges in implementing EAF from the perspective of who is benefitting from these policies and in what ways. As described in the juxtaposition of Fisheries Row and Kuisebmond township, it is clear that there are asymmetries in the balance of EAF's broad ideals of resource management and a holistic and systemic approach to control and regulation of Namibia's second most prominent resource. Onshore processing and value-adding are policies geared toward job creation and Namibianisation aims to ensure transformation from historic inequalities. In terms of community based management of natural resources, it is particularly important to recognise the local and global tensions that arise here. Namibians who live and work in Walvis Bay are much more concerned with sustainably managing the resources to ensure future use and benefits for their community and country. Foreigners invested in the industry may be aware of the environmental impacts of their business but have less interest in the intricacies of sustainable resource management as their ties to the country are for business purposes.

The success of Namibianisation is apparent in the opportunities individuals have been able to capitalise on within the industry such as Uillika's experience. Namibianisation also highlights the importance in recognising a distinct Namibian fishing ethos that can contribute to EAF in terms of fishers' knowledge, experience, and changes in fishing over time. Coupling the wealth of information from the industry workers and their immediate concerns into EAF policies requires a framework that can be reviewed in a consistent manner. The government must negotiate a policy knot of decision making that addresses both a stimulated, continued interest and investment within the industry and the goals aimed at poverty reduction, food accessibility and security and well-being of its citizens. Namibianisation is a part of these goals but needs to be reviewed in the current circumstances where global recession is unequally affecting industry workers and companies. The difficult balance in government's aims to distribute economic growth and welfare towards disadvantaged groups on the one hand and to stimulate and attract investment into the industry on the other hand show that an umbrella term of human well-being needs more definition in terms of what benefits arise and community dialogue in determining specific areas of concern (health, education, housing, food security). Additionally, more transparency in company economics and accounting wherein EAF can be incorporated into specific company policy and address unequal distributions of wealth, labour, and control. Namibianisation policies elicit the need to re-evaluate their repercussions as the outcome affects the success of EAF. Restructuring, through community involvement, continued increase in domestic consumption of fish to combat malnutrition and food scarcity, and dissemination of revenue directly from the fishing industry into struggling sectors of the national agenda may contribute to be more comprehensive inclusion and thus a thriving and robust coastal community.

Concluding Remarks

Namibianisation policies have been largely unrealised in the hake sector. This is attributed to a variety of factors including favouring global markets for hake, prolonged foreign dominance in shareholding and ownership, lack of capital for new entrants into the sector, and shifts in commercial operations. However, the visibility of the Namibian fishing culture echoes a rich history of knowledge and experience particular to the area. Where policy is unable to quantify or capture statistically, this ethos speaks to the goals of Namibianisation in the sense of shared knowledge, identity with the land and sea, and a Namibian for Namibians industry. Namibianisation policies

highlight strategies for value-adding and job creation but need further developments in addressing the human-well being element of EAF through a detailed review of both policies. Offering space for dialogue between industry workers, company managers, foreign investors, researchers, and government officials, may offer new insight into effectively implementing and reviewing current fisheries policy.

Conclusion:

Palsson once asked, "what the consequences of suppressing the nature/society dualism will be. Will it mean that the projects of development and the environment become, once again, subject to the technological fetishism and green revolutions, relegated to biology, genetics, and engineering – with all the (im)practical implications such reductionisms have had in the past?" (2006:90). As this study has shown, through detailed ethnography in the trawl sector, that such an approach is not reductive but dynamic, and illustrates the tensions between industrial technologies and local knowledge, the perceptions of capital and the knowledge economy, while pointing to successes and failures of Namibian fisheries policies through the examination of Namibianisation and EAF.

Knowledge(s) form the dynamic link that threads through this analysis, weaving through the network of interactions. Recognising the wealth of knowledges actively enmeshed within the sector provides new spaces for dialogue. In an era of real environmental concerns, it is imperative to incorporate the myriad of voices, activities, and complexities in constructively informing progression of comprehensive social ecological initiatives. Merging the practical and the theoretical into an assemblage of understanding re-conceptualises the bounded categories that lead to disconnects, asymmetries, and stagnation offering fresh approaches to divisions within academics and management. I hope to have shown, through rich ethnography, how the integration of human, technological, and environmental relations, illuminates the interconnectedness of our cosmos. Actors arise in various forms, from hake, vessels, social relationships, and markets that emphasise Latour's notion of cosmopolitics. From this, an anthropology of the environment emerges, one that is sensitive to the relations, discourse, and practicalities that contribute to the natures-cultures politics. Drawing from the rich body of literature that incorporates multiple networks that enact experience, local perceptions of the environment and socio-technical knowledge and experience illuminate the dynamic features of the commercial fishing industry. As the CUS research team attest, the collaboration of new forms of knowledge and strategies that should facilitate the building of partnerships, vision, and leadership essential for managing complex interdependencies are enmeshed in the new ways of achieving environmental and social benefits in coastal communities. Through expanding the vision and the encouragement of new ways to work out differences and shared objectives, the capacity for community learning and involvement contribute to the integration of knowledges and tease out the asymmetries of fisheries management (Ommer et al 2007). Globally,

studies point to the uncertainties of the political, economic, technological, and environmental governance (see Palsson 1994, Ommer et al 2007, Neis 2008, Johnsen et al 2009, Lien & Law 2010) that now require review in a re-vitalised manner, inclusive of multiple natures and cultures. The socio-technical networks of knowledge, capital, technologies and identity as described in this research point to the importance in re-thinking political ecology in management therefore contributing to a holistic and sustainable policy framework.

The hake fishery in Walvis Bay, Namibia is a bustling enterprise comprised of a variety of interlinked actors. It is a complex industry that is enmeshed in local and global politics of nature, uncertain market trends and fluctuations, and national concerns of poverty, employment and health. Challenges arise in the impacts of industrialism, capitalism, and identity politics that are symptomatic of the modernist regime of dualisms. Ethnography of the trawl sector illuminates a cosmopolitical reality that recognises natures, cultures and various knowledge structures. Through this lens, a knowledge paradigm emerges in which symmetry exists between skill and experience, informed policy implementation and the practicalities of fishing at the commercial level. This challenges the very structures bounded within much of the global discourse on science, technology, culture, society and nature, where such categories institute a hierarchy of control, therefore exposing the uncertainties of social ecological analyses.

This study emphasises the importance in tracing knowledge, in its various forms, through processes of transformation that will inform decision-making for future generations of coastal communities to come, ensuring the necessary tools to thrive. Further ethnographic research in other sub-sectors such as long-lining, small pelagics, and onshore factories would also contribute to the social-ecological analyses, providing a holistic approach to understanding the intricacies of the fishing industry. Fisheries management still relies heavily on scientific research, and this ethnography attempts to bridge the disciplinary constraints and offer analysis that speaks to the multiplicity of knowledges in research as well as in the daily operations of the hake fishery.

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