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Tracks, trawls and lines—Knowledge practices of skippers in the Namibian hake fisheries

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ABSTRACT

Based on interviews with demersal trawl and longline captains targeting hakes (*Merluccius capensis* and *Merluccius paradoxus*), this paper looks into specific knowledge practices in relation to the skipper's tasks of finding and catching fish and some of the challenges encountered when attempting to mobilise that knowledge for fisheries management. Observing that knowledge production is influenced by the technology and fishing method used, the article describes several key aspects of fishing behaviour at sea. These, involve critical decisions the skipper has to make, such as choice of fishing area, position, direction and length of trawls. Specific insights about the social–ecological network of relations that can be gained from observing these decisions, are discussed. The article concludes that formal methods to mobilise and transfer information from fishers through logbooks and digital cartography, cannot capture important aspects of fishers' knowledge because the information is decontextualised and separated from experiences that are made in the process of fishing. Rather than focusing on fishers as providers of data on fishing mortality only, considering fisheries as networks of relations in which fishing takes place in response to other actors, allows a better understanding of fisheries dynamics, which in turn is important for sustainable fisheries management.

1. Introduction

Fisheries are in crisis world-wide, overfishing is the main cause for stock declines [1] and it is clear that single stock assessments alone cannot be relied on for sustainable management of fisheries [2]. Consequently reduction of fishing effort and capacity are seen as important goals in fisheries management [2], but a decrease in the number of vessels can be offset by increased fishing efficiency [3,4]. Increasing the economic efficiency of fisheries, is believed to make fisheries more susceptible to managerial control and thus to protect fish stocks, but can also have disastrous effects for both fish and fishers [5]. Often such tendencies remain invisible to fisheries management until it is too late. It thus has been argued that the sustainable management of fishery resources requires better understanding of the processes and relationships that characterise a fishery [6]. The lack of up to date scientific knowledge about fishing operations has been identified as negatively effecting fisheries management in Canada [7]. Timely access to fisheries dependent data, e.g. from logbooks, is one important part of such understanding [7]. Fishers' knowledge research can contribute important information to fisheries management and stock assessment [7–9]even in data rich fisheries [10].

Murray et al. [9] developed a multi methods approach that allows the combining of fisher's knowledge and scientific fisheries data. A key component of this methodology is the collection of spatial information, e.g. catch locations, spawning areas, fish movements during interviews with fishers. The information is consolidated and scaled up to create composite maps [9].

This approach was developed specifically for the fixed gear cod fishery in western Newfoundland, but has since been applied to the small pelagic fishery there [11] and the Namibian demersal trawl and longline fisheries [4]. All these fisheries are highly mobile and the Namibian fisheries are operating offshore. Most mobile offshore fisheries are industrial and characterised by increasing loss of organic associations and the emergence of cybernetic networks of technologies. Such fisheries are managed by explicit governance mechanisms that rely on scientific representations of fish and that are increasingly internalised into the fishery via catch quotas [12]. Such cyborgised fishing operations [13,14] are associated with the use of formal,

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explicit and transferable knowledge rather than the experiential, personal and embodied knowledge equated with traditional inshore fishing operations [15,12]. Computers, the Global Positioning System (GPS) and digital cartography play a central role in the technoculture of cyborgised fisheries. These technologies are also central in the scientific surveying of the fish stocks, facilitate the catching of fish and are used to both formalise and mobilise fishers' knowledge. The three dimensional Cartesian grid imposes lines onto the world [16] to georeference the ocean and make it exploitable [17]. What is more, in this scientifically unified space-time of global fishing there is no place for multiple accounts of nature, nor for the experiential, personal and embodied knowledge of local, traditional fishers:

Mapping and databasing using scientific coordination of commensurability techniques not only subsume differing spatialities and temporalities into one abstract space-time they also omit the multiplicitous and interactive dimensions of the local and the practical, the stories and the journeys, the spiritual and the experiential [17].

The concept of local knowledge in the context of dynamic and mobile commercial fisheries is therefore considered problematic and has been replaced by the notion of global harvesting knowledge [12]. However, as all knowledge is situated knowledge [18] this paper argues that the foregrounding of the formal, technologically aided aspects of knowledge in commercial fisheries tends to limit focus on the economic efficiency that these forms of knowledge aim to increase. Such a focus can obscure the personal and experiential aspects of fishers' knowledge, that remain implicit also in commercial fisheries. In the day to day practice of off shore fishing in Namibia different types of knowledge play out in the relations between people, fish, technology, nature and management. These knowledge types range from digitised spatial data and formalised logbooks that are required for fisheries management to the personal books that fishers keep and the non-codified knowledge born of experience.

The first part of this paper will address specific knowledge practices in the Namibian demersal fisheries targeting hakes (*Merluccius capensis* and *Merluccius paradoxus*) and discuss how different forms of knowledge are created and shared and how they do or do not enter into management decision-making. Building on suggestions by Murray et al. [15] that observing fishing behaviour is one way of gaining insight into interactions between fishers, fish and the wider social–ecological network the article will then discuss some specific insights that can be gained from fishers and their logbooks about the social–ecological network of relations in the Namibian demersal hake fisheries.

1.1. The Namibian demersal trawl and longline fisheries for hake

In Namibia two species of hake, shallow-water hake (*M. capensis*) and deepwater hake (*M. paradoxus*), are caught by demersal trawl and long-line vessels. These species once yielded the largest hake catches in the world [19]. The Namibian hake fisheries did not originate from traditional local fisheries but were developed after WWII by foreign interests [20–22]. By 1980 distant water fleets from foreign fishing nations (mainly European and eastern bloc countries) had reduced the once abundant resource to less than 50% of its former size. And after gaining independence in 1990 the Namibian Government restructured Namibia's fishing industry aiming to rebuild the hake stocks and generate maximum benefits for Namibians [21]. Today, with few exceptions, the hake fishing vessels in Namibia are owned by vertically integrated fishing companies that employ the skippers and crews.

On board a Namibian hake fishing vessel division of labour rules. The deckhands do all the heavy, physical work that is involved in shooting and hauling the fishing gear. In the factory below deck people clean the fish and pack it away, either whole or with the heads and tails cut off, depending on the type of operation. Below all of these activities, in the engine room the engineers ensure that the ship's engines run smoothly and look after the various hydraulics and other mechanisms that are involved in the operation of a high tech fishing vessel. The bridge is located above the deck and from this panoptic vantage point the skipper and mate preside cf. [23]. Their responsibility is to drive the vessel, to find the fish and to put the fishing technology that is at their disposal to best use, while keeping the crew and the vessel safe at all times. In order to keep all these people fed for a week or so at sea there is the cook in the galley preparing the meals.

In 2011 there were 51 demersal trawlers and 16 demersal longline vessels catching hake in Namibian waters. Most of the trawlers are wetfish trawlers, which means the catch is not frozen at sea but packed on ice. The wetfish trawlers are 30–50 m long. The larger freezer trawlers are about 70 m long. Longline vessels are between 20 and 35 m long. Wet fish trawlers have a loading capacity of 2000–2200 bins of fish, which translates into between 60 and 80 t. The fleet catches about 148,000 t of hake annually [24].

The Ministry of Fisheries and Marine Resources (MFMR) determines an annual total allowable catch (TAC). The calculation of the TAC is based on information that scientists collect during an annual survey as well as catch data provided by the industry through logbooks. Since 2000 the annual survey is conducted on board a commercial fishing vessel. During a survey fishing takes place in accordance with a particular plan, the survey design, which determines the route that the vessel follows and the locations, or stations, at which fishing takes place. The survey design also prescribes the number and duration of the trawls as well as the vessel speed. The catch is recorded and samples are taken for further biological analysis, which allows the development of abundance indices. Similar indices are developed based on the commercial catch data and both are used to monitor population abundance. Logbook data and biological samples taken from the commercial catch are used by MFMR to determine the fishing mortality, which is important to calculate the TAC [24]. The commercial fleet captains also use logbooks to make fishing decisions.

2. Methods

Fieldwork was conducted in 2009 and 2010 in Walvis Bay, Namibia, using multiple methods to contact captains. At that time 63 demersal trawl vessels and 13 longline vessels were licensed to operate in Namibian waters, but it is not known how many were active [25]. As there is no list of active captains, the Namibian Hake Association and the managing directors of fishing companies provided initial contact details for captains. Snowball sampling [26] was used to identify additional captains who were reputed to be highly experienced in the fishery similar to the methodology recommended by Davis and Wagner [27]. Semi-structured interviews with eight trawl and six longline skippers were conducted based on the methodology for local knowledge interviews with fishers described by Neis et al. ([28], also see [15]). In 2009 these captains had a minimum of 12 and a maximum of 40 years of fishing experience, had worked in Namibian waters between 5 and 40 years and in the hake fishery (in Namibia and South Africa) between 5 and 31 years. In addition, participant observation was carried out at sea during a four-day fishing trip aboard a Namibian trawl vessel. Interviews were audio recorded and transcribed. The data was coded and categories and themes were constructed [29] using Tams Analyzer version 14.3b. To honor my obligation as researcher to consider risks and benefits that may derive from participation in our research [10,30], participants were provided