Situating Arab-Israeli artisanal fishermen's perceptions of marine litter in a socio-institutional and socio-cultural context

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ABSTRACT

Understanding the mental constructs underlying people's social responses, decisions and behaviors is crucial to defining the governance challenges faced in dealing with marine anthropogenic litter. Using interactive governance theory, this study provides qualitative insights into how a small group of Arab-Israeli artisanal fishermen perceive marine litter and its impact (system to be governed) in the context of the socio-institutional structures (governing system) which manage waste and aim to protect the surrounding environment. It demonstrates that, until the relationships between local people and the various governing institutions are transformed, there is little hope for citizen cooperation in reducing marine litter long-term in the case-study site. More generally, underlying narratives and politics playing out at a local level need to be understood in order to identify which interventions are likely to be effective and which are not. An intervention checklist to assess the potential effectiveness of a marine litter intervention is proposed.

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1. Background

Dealing with marine litter involves grappling with a complex social-ecological system which involves diverse and dynamic interactions at various scales between, and within, natural and social systems. Defined as "any persistent, manufactured or processed solid material discarded, disposed of, or abandoned in the marine and coastal environment", marine litter poses a threat to the environment, economy and human health (UNEP, 2009). Plastic items make up 50–80% of marine litter found on the beaches of the four European regional seas (Mediterranean Sea, Black Sea, North-East Atlantic and Baltic Sea) (UNEP, 2009; Veiga et al., 2016), a figure which rises to 90% on the Israeli coastline (Alkalay et al., 2007; Pasternak et al., 2016). The lack of consistency in methodologies used to collect and measure marine litter make it difficult to analyse trends and to draw comparisons between the Regional Seas (UNEP, 2009). The main sources of marine litter in the Mediterranean are shoreline and recreational activities (52%) and smoking-related activities (40%) (UNEP, 2009). The last decade has brought public awareness of the high quantities and harmful effects on ecosystems and human health of microplastics in the global marine environment (Thompson, 2015). Preliminary results of a recent Israeli study indicate that abundances of microplastics in Israeli coastal waters are twice as high as the global average and up to 10 times higher than the average

of microplastic particles found in the Western Mediterranean (Pasternak et al., 2016).

Marine litter has featured prominently on the European policy agenda in recent years, with one of the 11 descriptors of the EU Marine Strategy Framework Directive (MSFD, 2008/56/EC) dedicated specifically to marine litter. The MSFD requires EU Member States to implement measures to achieve or maintain Good Environmental Status (GEnS) in their marine waters by 2020, using existing regional cooperation structures to develop co-ordinated marine strategies in the four European regional seas. In the Mediterranean regional sea, the United Nations Environmental Program (UNEP) Mediterranean Action Plan (UNEP-MAP, 2008) has been adopted by all 22 (European, Asian and African) Mediterranean coastal states pursuant to the Barcelona Convention. (Cinnirella et al., 2014). The overriding objective of the Regional Plan on Marine Litter Management in the Mediterranean is to achieve GEnS in this regional sea (UNEP-MAP, 2014). Although the MSFD applies to the Mediterranean Sea, the EU currently has jurisdiction over only 36% of this region. Challenges to governance of the Mediterranean Sea include the economic gap between the EU and non-EU coastal states (reflected in the different societal and ecological objectives in the region) and the need for alignment between the overlapping governance structures of the MSFD and MAP (Cinnirella et al., 2014).

Extensive research has already been carried out marine litter (e.g., Jambeck et al., 2015; Ryan, 2015). Most research has focused on impacts on the marine environment, particularly on marine wildlife (e.g., (Laist, 1997; Gregory, 2009; GEF, 2012; Bilkovic et al., 2014; Hardesty et al., 2014; Vegter et al., 2014; Gall and Thompson, 2015; Hardesty et al.,

2015; Kühn et al., 2015). Recently, researchers have started to investigate the impacts of marine litter on people (Wyles et al., 2015; Butler et al., 2013) and the relationship of people, particularly users of the marine and coastal environment, to this litter (e.g., Slavin et al., 2012).

It is widely understood that without understanding the causes of marine litter, regulatory solutions will be greatly challenged (Chen, 2015) and that social norms are a driver of littering behaviour (RPA, 2013; Schultz et al., 2013). It has also been shown that, in addition to people's perceptions, littering behaviour is impacted by context specific factors such as the waste management capacity and infrastructure, along with the general cleanliness, of an area. Thus, understanding the relevant governance context is important to guide the formulation of effective policy measures to combat marine litter (RPA, 2013; EEA, 2015). In addition, the need to articulate the assumptions and values underpinning the design of policy approaches is gaining increasing recognition (Mee et al., 2008; Kooiman and Jentoft, 2009; Song et al., 2013; Mee et al., 2015; Victor, 2015; Voyer et al., 2015). This case study considers how the mental constructs underpinning artisanal fishermen's perceptions of marine litter interact with the relevant institutional context for the governance of the 'wicked' problem of marine litter. Artisanal fishermen[1] are an important stakeholder group, related to the problem of marine litter, both as contributing to and being affected by it (see Nash, 1992; Al-Masroori et al., 2009). The purpose of the research is to provide policy guidance towards identifying possible points of intervention for waste planning and management approaches that could reduce marine litter in coastal towns.

2. Quantitative and qualitative studies

Although literature on perceptions of marine litter and awareness of its impacts is still sparse (e.g., Munari et al., 2016), the importance of research into such perceptions has increased in recent years (e.g., Eastman et al., 2013; Veiga et al., 2016). At the EU level, the MARLISCO (www.marlisco.eu) and CleanSea (www.cleansea-project.eu) projects have carried out extensive European-wide surveys on the perceptions of marine litter by the public and stakeholders (including commercial fishermen). However, these studies did not include in-depth qualitative research on fishermen's perceptions of marine litter.

Earlier quantitative research investigated local artisanal fishers' perceptions of ghost fishing by traps in Oman by assessing the economic loss caused by such ghost fishing to the Omani fishery (Al-Masroori et al., 2009). Using social and beach surveys, Slavin et al. (2012) examined perceptions of marine litter from land-based sources by local beach and coastal user groups, to understand social drivers and physical pressures of marine debris in Tasmania, Australia. They found that certain populations were more likely to experience guilt feelings about littering and/or more likely to do something about the litter. These findings do not, however, indicate what social constructs or conditions drive litter problems. Bonaiuto et al. (1996) demonstrated that local and national identity processes play an important role in predicting the perception of a threat to the local environment. Thus, the more attached English secondary school students were to their local beach (the stronger their local identity), the less they perceived it as polluted, even if the EU assessment of cleanliness of the same beach indicated otherwise. Similarly, the more nationalistic the students were, the less they perceived their national beaches as polluted (Bonaiuto et al., 1996).

An exception to quantitative-study trends is qualitative research examining the impacts (but not perceptions) of marine litter on a small community of subsistence fishermen in Indonesia. The study focused on how marine litter impacted choice of fishing gear and fishing areas and, consequently, led to economic loss for the fishermen (Nash, 1992). Wallace (1990) used surveys to investigate the extent of the knowledge of commercial fishermen and recreational boaters about marine debris and entanglement. The study's results were limited, finding that the respondents perceived the causes of marine litter to originate from a group other than their own. Butler et al. (2013) looked specifically at the problem of ghost fishing gear with the intention of finding points of intervention to improve the situation. Wyles et al. (2015) used qualitative as well as quantitative methods in their study of the psychological impacts of effects of marine litter on people. From surveys administered to university undergraduates and members of the public, the authors found that marine litter can undermine the psychological benefits of coastal environments, with public-litter being rated more negatively than fishing litter.

Song et al. (2013) have pointed out that, while it is useful to understand attitudes and perceptions, these are underpinned by interacting and changing values, principles (or norms) and images (or worldviews), and that it is necessary to understand these underlying mental constructs to make a particular problem more governable. According to interactive governance theory, societal systems are made up of three components: a human-made "governing system", a natural-social "system to be governed",[2] and "governing interactions" which flow between the governing system and system to be governed (Kooiman and Bavinck, 2013). This theory examines underlying values, principles (norms) and images (worldviews) to improve understanding of the social "system to be governed". Interactive governance theory has been applied to fisheries governance (Jentoft, 2007; Jentoft and Chuenpagdee, 2009; Kooiman and Bavinck, 2013; Song et al., 2013) and, more recently, to the governance of marine protected areas (Voyer et al., 2015). In this paper, we apply interactive governance theory to help to identify the effectiveness of marine litter interventions in a particular socio-institutional and socio-cultural context, by considering the relevant values, norms and worldviews in the social "system to be governed". We understand 'values' as what people deeply believe and are ready to take action for (Kluckhohn, 1966; Zayadskaya and Welzel, 2013); 'norms' as implicit social codes of conduct (Checkland and Poulter, 2006); and 'worldview' as "*a collection of attitudes, values, stories and expectations about the world around us, which inform our every thought and action…. A worldview is how a culture works out in individual practice*" (Gray, 2011).

This research addresses a gap in the lierature by providing qualitative insights into how artisanal fishermen perceive marine litter and its impact on their fishing activities and the marine environment ("system to be governed") in the context of the institutional structures ("governing system") which manage waste and aim to protect the surrounding environment. It problematizes (Foucault, 1984)[3] the interactions between the governing system and the systems (natural and social) that are being governed in the fishing village area of Jisr-Az-Zarqa, a coastal town on the Mediterranean shores of Israel (Fig. 1) by considering how local worldviews, values and norms work together to influence governance processes and outcomes. The case study sits within the wider policy context of the joint commitments of the European Commission (via the MSFD) and UNEP (via the Mediterranean Action Plan) to achieve and/or maintain a clean, healthy and productive Mediterranean marine and coastal environment. It illustrates how differences in economic conditions and social priorities between the EU and non-EU political blocs in the Mediterranean region (Cinnirella et al., 2014) can impede the achievement of this shared goal.

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[1] By artisanal fishermen, we refer to fishermen engaged in "traditional fisheries involving fishing households (as opposed to commercial companies, using relatively small amount of capital and energy, relatively small fishing vessels (if any), making short fishing trips, close to shore, mainly for local consumption" (FAO, 2005, n.p.).

[2] Although we adopt the interactive governance theory concept of a "system to be governed" which is part-natural and part-social, we understand that, strictly speaking, only human activities can be governed, and not natural systems as such.

[3] By "problematize" we mean "to inquire into the terms of reference within which an issue is cast" (Bacchi, 2012: 1).