

# The Influence of Stakeholder Perception on Small-Scale Fisheries Management and Policy

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# Review: The Influence of Stakeholder Perception on Small-Scale Fisheries Management and Policy

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## 1. Introduction

Stakeholder involvement is important in improving decision making (Beierle, 2002 & Reed, 2008), and is considered a fundamental component of marine management and fisheries governance (Abecasis et al., 2013; NOAA, 2015; Rodríguez-Basalo et al., 2019). Acknowledgment of this has led to the requirement of incorporating stakeholders being written into European Union (EU) laws, e.g., as a principle of good governance in the Common Fisheries Policy (European Parliament, 2013), and to promote sustainable development in the Maritime Spatial Planning (MSP) Directive 2014/89/EU (European Parliament, 2014); or, through voluntary inclusion of stakeholders, such as UK fisheries policy authorities engaging stakeholders in developing fisheries management plans (DEFRA & MMO, 2022).

Stakeholders have contributed to Marine Protected Area (MPA) management and designation (Charles & Wilson, 2008; Gleason et al., 2013; Pettifer et al., 2014), marine spatial planning (Giacometti et al., 2017; MFMR, 2018; Brickle et al., 2023), and fisheries management (Msomphora, 2015; Freed et al., 2016; The Scottish Government, 2022). Their involvement can benefit each process by providing new insights through local ecological knowledge (LEK) (Moreno-Báez et al., 2010 & Cavole et al., 2020), mitigating/resolving potential conflict (Soma, 2003; Gray & Hatchard, 2008), increasing acceptance and compliance of fishery management measures (Kessler, 2004; Aanesen et al., 2014; Freed et al., 2016; Retnoningtyas et al., 2021), and in collecting fisheries data to improve data quality (Khan et al., 2020). In contrast, those that feel less engaged often express negative opinions of fishery management (Pita et al.,

2010 & Rohe et al., 2017). As a result, there are clear benefits for managers and policy makers to recognise the legitimacy of fisheries stakeholder perception in informing marine management process.

Despite the benefits stakeholders bring to fishery management, the process is not without its challenges. Their involvement can be costly and time consuming (NOAA, 2015). Communication challenges can hinder management actions, which can be caused by insufficient integration of scientific and stakeholder knowledge, as well as fears that involvement can lead to greater limitations to fishing (Varjopuro et al., 2008; Dedual et al., 2013; Abreu et al., 2017; Tafon, 2019). In Chile, lack of communication between fishers and other stakeholder groups was found to weaken fisher's groups and increase their reliance on external sources (Franco-Meléndez et al., 2021).

Stakeholders can have very different views based on country, region, and the stakeholder group they belong to (Soma et al., 2018); these differences may result in misunderstandings and conflict (Verweij et al., 2010; Beyerl et al., 2016), lack of consensus (Kessler, 2004), and reciprocal distrust (Ebel et al., 2018). Additionally, stakeholders may feel they cannot have meaningful input (PISCES, 2012), which is linked to issues such as power inequalities (Reed, 2008), distrust (Crandall et al., 2019), and previous negative experiences of participation where data they provided was not used (Ebel et al., 2018). Regardless of the challenges, stakeholders can be particularly helpful in data-poor topics, filling in knowledge gaps where data is limited (Carey et al., 2007; Beaudreau & Levin, 2014; Cáceres et al., 2022).

Small-scale fisheries (SSF) represent a minimum of 40% of global fisheries catch; they support the livelihoods of 492 million people (FAO et al., 2022), and are important for ensuring food security, and reducing poverty (Noman et al., 2019). Information on SSF is considered a data-poor area; and this is often attributed to SSF multi-gear approaches, multi-species fishing, and geographic issues, e.g., covering large areas and remoteness (Salas et al., 2007; Pita et al., 2019). SSF management tends to focus on developing countries, excluding SSF challenges in developed countries, which may imply they are in 'good shape' (Teh et al., 2020); and yet, in the EU, small-scale coastal fishing accounts for 75% of fishing vessels, and nearly 50% of employment in its fishery sector (European Parliament, 2021). Regardless, SSF are often overlooked both in policy processes due to data scarcity (FAO, 2017) and by fisheries managers, which is suggested to be related to managers 'lack of deep insight' of SSF unique nature (Noman et al., 2019). In South Africa SSF were overlooked by The Marine Living Resources Act of 1998; and, as such fishers, NGOs, and researchers cooperated to challenge the Department of Environmental Affairs and Tourism in a class action suit in 2005; resulting in policy changes such as the new SSF Policy in 2012, and the Amended Marine Living Resources Act 5 of 2014 (Isaacs, 2016).

This review will focus on stakeholder perceptions, what drives them, and how they can influence decision making. Despite perceptions oftentimes viewed as anecdotal, evidence is emerging of their importance in improving management, governance, and conservation (Silva et al., 2015; Bennett, 2016; Beyerl et al., 2016; de Juan et al., 2017; Franco-Meléndez et al., 2021). Studies have reported inaccuracies of perception data in fisheries, perhaps due to perceptions based on assumption (Bartlett et al., 2009), limitations of knowledge on species they don't often catch (Damasio et al., 2015), or due to bias (Ruano-Chamorro et al., 2017). However, it is argued that biases do not mean local knowledge perceptions are useless, but rather that an acknowledgement of bias must be considered in management and assessments (O'Donnell et al., 2010 & Paterson, 2010). The review will briefly examine the different definitions used for 'stakeholder', 'perceptions', and 'small-scale fisheries', and clarify what is meant by them in the remainder of the document. Using case studies from the literature, it will explore the factors that influence stakeholder perception heterogeneity and look at examples of instances in which these perceptions have been used for SSF management and policy.

## 2. Definitions

### *Perception*

Depending on which source is examined, the definition of perception is slightly different. For example, the Oxford Dictionary of Biology (7th ed.) defines perception as 'The interpretation of sensory information using both the raw data detected by the senses and previous experiences'. However, Beyerl et al., (2016) argues that defining perception as the organisation of sensory information is too simplistic. This review goes into further detail on the definition of perception in terms of community-based resource management, investigating social-demographic factors, individual characteristics, environmental interactions, culture, and knowledge. Ultimately, the review considers perception as the 'subjective way people experience, think about and understand something'.

Jefferson et al., (2015) describe perception in the context of public perceptions research for marine conservation. They view perception as an 'umbrella term', stating it is made up of 'knowledge, interest, social values, attitudes, or behaviours'; and agree with Beyerl et al., (2016) by acknowledging that perception is influenced by factors that aren't sensory, such as age and gender. Focusing down into fisheries management, Soma et al., (2018) do not define perception, but suggest three channels through which stakeholder perceptions are shaped. These consist of what the stakeholder thinks is important to

aim for (what; their preference), how their objective will be achieved (how; how the measures are undertaken), and trust (who) in those who make policy decisions. In this review, we will consider perceptions as defined by Beyerl et al., 2016, and examine the influencing factors presented in the papers discussed above. We also consider perceptions as views and/or opinions.

### ***Stakeholders***

The literature commonly quotes the stakeholder definition from Freeman (2010) whereby a stakeholder is “any group or individual who can affect, or is affected by, the achievement of the organization's objectives”. Within marine fisheries, the term ‘stakeholder’ can refer to those involved or interested in marine fishery science, management, the marine environment and/or the activity of fishing (Pérez-Ramírez et al., 2012). It is proposed that ‘fishery’ is the main stakeholder referred to in the literature (Schwermer et al., 2020); aligning with the notion that stakeholders are commonly connected to the main resource use due to their importance for livelihoods (Sultana & Thompson, 2004). Groups that are considered stakeholders in fisheries typically consist of fishers and their representative organisations (commonly referred to as the principle/primary stakeholders), eNGO’s, academics/scientists, management agencies, Civil Society, governmental officers, and the tourism sector (Mackinson et al., 2011; Soma et al, 2018; Schwermer et al., 2020). On occasion, public members are involved as stakeholders too, such as traditional and church leaders (Brewer & Moon, 2015).

Schwermer et al., (2020) discovered that levels of public participation are low in marine fisheries research and suggest this may be due to lack of interest or that the public are not consulted. Conversely, Aanesen et al., (2014) propose that the public could be interested in marine fisheries, but that they would have to join eNGO’s to have any impact. The EU MSP Platform (2021), a service for EU members to share knowledge of MSP, acknowledges that stakeholder involvement is used interchangeably with public participation. Their interpretation states that stakeholders and the public are separate, but they do affirm that both groups should be involved. However, due to the notion that fisheries resources are a public resource, some do consider the public as stakeholders (Mikalsen & Jentoft, 2001 & Schwermer et al., 2020). The public have demonstrated their capability in effecting policy changes and can have a very powerful voice. One notorious example is the public perception response to killer whale (Orca; *Orcinus orca*) captivity after the Blackfish documentary, whereby SeaWorld’s stock prices fell, and legislation was introduced in the USA to phase out Orca exhibits (Parsons & Rose, 2018).

This review will use the definition suggested by Pérez-Ramírez et al., (2012), and include the public. We view the public, such as community leaders and those buying fish for consumption, as having a role to play in influencing fisheries management and policy.

### ***Small-scale fisheries***

Small-scale fisheries are notoriously difficult to define, possibly due to their complexity, what is small-scale in one area not being considered so in another area (Chuenpagdee et al., 2006), and being referred to with interchangeable names such subsistence, artisanal and traditional fisheries (Halim et al., 2019). This review does not aim to define SSF, but it is important to acknowledge there is no universal definition, and to be aware of the discussions surrounding this. SSF are typically attributed with local communities, and embedded with traditions and values (FAO, 2015). The Hidden Harvest report (2012) puts forward an overview of characteristics associated with small-scale and large-scale fisheries (Table 2.2 in the report), aiming to help differentiate between them; these include vessel sizes & types, fishing grounds, and utilisation of the catches.

Chuenpagdee et al., (2006) identified some common definitions among countries that they summarise in Table 1 of their paper and identify vessel size as a key factor. A more recent paper by Smith & Basurto (2019) supports this, finding that both vessel size and gear type were the primary attributes used to define SSF in the literature. A definition proposed for SSF in Indonesia by Halim et al., (2019) states the gear must be manpowered only, whilst the fishery itself must be ‘managed at the household level, and fishing without or with a fishing boat of < 5 gross tonnes’.

However, a UK study found that 65% of fisheries stakeholders viewed classification by vessel size as insufficient, and suggested that policy addressing fisheries management by vessel length resulted in an increased number of ‘super-under-10’ vessels that fish more akin to large-scale fisheries than SSF (Davies et al., 2018).

Smith & Basurto (2019) describe a case study whereby the lack of clear definition classifies all coastal and inland fisheries in Tanzania as small. They explain this is a problem because the small, *Rastrineobola argentea* (Lake Victoria sardine) community-based fishery is classed with the export, foreign-based Nile perch fishery, overriding the *R. argentea* workers in fisheries governance. This need to differentiate between fisheries is addressed in the FAO (2017) workshop tackling improvement of knowledge on SSF. Here they present a matrix (Table 2; FAO, 2017) that provides further classification based on Table 2.2

from the Hidden Harvest report (2012). The matrix assigns a numeric value to each characteristic, which are then collated to an overall score. This aims to differentiate between large-scale fisheries and SSF, with could potentially resolve classification issues like in the Tanzania case-study discussed above.

### 3. Discussion

Beyerl et al., (2016) examined the factors that affect perception in community-based resource management. Many of these are echoed in small-scale fisheries studies, especially socio-demographic characteristics, such as age (de Juan et al., 2017 & Liao et al., 2019), gender (Franco-Meléndez et al., 2021 & Murunga, 2021), education (Sutton & Rudd, 2016; Abreu et al., 2017; Gehrig et al., 2018), and religiosity (Brewer & Moon, 2015).

Gear type can be a strong grouping variable when related to perception influence. Fishers can sometimes disapprove of gears other than their own and can be more supportive of fishing regulations that restrict gear they do not use (Pita et al., 2013; Kincaid et al., 2014; Malcolm et al., 2021). In the Danajon Bank, Philippines, fishers that use 'harmful' gear (seines and bottom trawls) preferred a fisheries management scenario that maximises income and were least receptive to a scenario that maximises ecological outcomes, whereas those that used gears classed as 'not harmful' (passive gears e.g., pots) preferred the ecology-centred scenario (Bacalso et al., 2013). In Brazil, those that use selective gears exhibit more conservationist attitudes than those who use non-selective gears (Silva et al., 2015). These studies could indicate that fishers choose their gears based on their concern for the marine environment. However, a study on an inshore SSF in Zanzibar did not find significant differences in perceptions by gear type, but found that age and education were influential (Gehrig et al., 2018); and, in east Africa younger fishers were observed to be more likely to use harmful gear (Cinner, 2009).

Age is frequently referred to in the literature when referencing the perception of fishers. Older fishermen tended to have considerably more experience and were more likely to perceive declines in fish abundance and sizes (Hauzer et al., 2013; Giglio et al., 2014; Boubekri et al., 2022). This could be due to 'shifting baselines syndrome', which is when fishers use the state of the environment as it is when their careers start as a baseline to judge changes against (Pauly, 1995). Age is also identified as a factor of non-compliance to management measures. Younger (< 40 years old) small-scale fishermen in Brazil on the north-eastern coast were found to be less likely to comply with management, along with those that used non-selective fishing gear (Silva & Lopes, 2015). However, other studies in this area found the opposite,

whereby no difference between age groups was found (Karper & Lopes, 2014), or that older fishers were less compliant (Silva et al., 2021). Karper & Lopes (2014) suggest that age and financial situation interact in contributing to non-compliance; proposing younger fishermen would be more likely to comply under stricter punishment than middle-aged fishermen, who are more expected to 'cheat the system' regardless of punishment, driven by their need of income. Across the two studies it is suggested that older fishers comply less due to reluctance in changing old ways, perceptions that they are unable to learn new activities, and no other options for income.

The age-financial interaction has also been cited as reasons for non-compliance in Fiji, but for younger fishermen instead. Young male fishers that perceived no alternative source of income or livelihood were likely to poach, and exhibited non-compliance with management measures (Rohe et al., 2017). However, another possible reason was attributed to a lack of consultation of young fishermen in management measures; nevertheless, older males reported there was a consultation process, but the younger fishermen would have been too young to be involved. In contrast, small-scale Chole fishermen in Tanzania who were more involved were less supportive of fisheries management measures than Utende fishermen who had less involvement (Kincaid et al., 2014). This is speculated to be due to the type of involvement, as Utende fishermen were involved with planning and implementation of management, whilst Chole fishermen were more involved in terms of gear replacement efforts and retraining. This example highlights the importance of ensuring stakeholders perceive that they have the opportunity to participate meaningfully. Those that consider themselves to have meaningfully contributed tend to be more satisfied with management decisions (Crandall et al., 2019).

Fishers that have negative perceptions of management and policy tend to report less involvement in the management processes (Pita et al., 2010 & Musiello-Fernandes et al., 2017). For example, stakeholders in South Africa that were involved in creating the 2012 'Policy for the Small Scale Fisheries Sector in South Africa' were left out during the creation of the 2016 Regulations, despite putting forward their concerns, resulting in limited support for the regulations (Sowman & Sunde, 2021). Many studies have found fishermen want to increase their participation (Himes, 2003; Pérez-Sánchez & Muir, 2003; Trimble et al., 2014; Di Franco et al., 2020). Fishers may think their knowledge is not valued by decision-makers (Tafon, 2019), and may no longer participate due to previous meetings producing no outcome or stakeholder fatigue (Trimble & Plumber, 2018). A study on Spanish SSF stakeholders discovered that most stakeholders perceive fisher's influence as low in decision-making, and that all stakeholders were viewed as having less influence than the governmental Regional Ministry (Semitiel-García & Noguera-Méndez, 2019). This



demonstrates that stakeholders not belonging to a fisher's stakeholder group are also at risk of not participating meaningfully. NGO's may question how meaningful their input is, with concerns that their participation is used as 'greenwashing' (Berghöfer et al., 2008). The Cambridge Dictionary defines greenwashing as 'behaviour or activities that make people believe that a company is doing more to protect the environment than it really is'. At the time of writing this review, legislation addressing greenwashing is soon to be proposed in the EU and UK.

The importance of trust both within fisheries stakeholder groups themselves, and between stakeholders and government for successful fisheries management is well documented in the literature (Berghöfer et al., 2008; Ordoñez-Gauger et al., 2018; Chavez Carrillo et al., 2019; Pita et al., 2019; Semitiel-García & Noguera-Méndez, 2019). Different factors can influence trust, for example distrust between fishers and management could be due to information they disclosed in the past being used against them (Ordoñez-Gauger et al., 2018), resulting in reluctance to engage if aware they are being asked for management reasons (Ames, 2003); and distrust between NGOs and other stakeholders owing to NGO funding sources (Espinosa-Romero et al., 2014). Lack of trust has been linked to non-compliance (Silva et al., 2021); for example, small-scale fishers in Lake Victoria, East Africa, do not trust other fishers to stop using illegal methods, and so do not comply with the rules themselves (Cepić & Nunan, 2017). This distrust may discourage stakeholders from engaging with management and policy makers in the future.

Communication in multi-stakeholder processes can be inadequate, especially between fishermen and researchers, e.g., information presented in different formats (Varjopuro et al., 2008), and insufficient transfer of knowledge (Dedual et al., 2013). Fishers may not always trust scientists, believing scientists want to limit their fishing access and taking issue with scientific communication, which can be full of jargon (Tafon, 2019). The issue of common language can be an obstacle to stakeholder engagement, and scientists can be seemingly unaware of this (Glenn et al., 2012). In the Philippines seahorse small-scale fishers and scientists engaged using graphic symbols, such as cut outs of species at different sizes to represent abundances, and this successful exchange of information facilitated fisheries management on Danajon Bank (Meeuwig et al., 2007). However, they acknowledge biases may influence this data, and thus the validity of fishers' knowledge is questioned. The data standards may differ between stakeholders and management, and may result in fishers' perceptions not being used, damaging their trust with management and/or other stakeholders. Their perceptions may be dismissed as anecdotal (Ames, 2003); however, many frameworks have been created in the literature aiming to quantify this data (Bennett et al., 2020; JNCC et al., 2020; Aguado et al., 2021).

Fishing can be an important aspect of culture to SSF communities through passing on of traditions and practices between generations (Aldon et al., 2011). Cultural and social values are suggested to influence the perceptions of fishers (Dimech et al., 2009), and stakeholders have expressed the requirement of incorporating culture into management (Gómez & Maynou, 2021). The influence of culture can be very strong, for example to curb dynamite and cyanide fishing in Bien Unido Reef Marine Park, Philippines, they planted religious statues underwater, successfully curtailing these fishing methods (Jefferson et al., 2015). In some areas, SSF consider traditional leaders as the most important stakeholder, contrasting the Spanish SSF study by Semitiel-García & Noguera-Méndez (2019). For example, small-scale finfish fishery stakeholders in the Solomon Islands perceive traditional leaders as the central stakeholders (Brewer & Moon, 2015); and, in Ghana small-scale fisher's obey traditional rules local to them, and have a Chief Fisherman in their community who aids in enforcing rules and regulations, gives permission to those wanting to fish in their fishing grounds, and curbs illegal, unreported, and unregulated (IUU) fishing methods (Nunoo et al., 2015 & Asiedu et al., 2022). Likewise, in Ngazidja, Comoros, fishing villages have their own fishing associations which are usually led by older fishers with more experience (Hauzer et al., 2013). The study reports these associations implement customary regulations which all fishers in the association are allowed to feedback on, resulting in high rates of compliance; furthermore, the associations and their fishers help to monitor and enforce these regulations.

Villages can have their own cultures, and as such perceptions can be strongly associated with villages (Gehrig et al., 2018). In Fiji, leaders used to implement closures of fishing grounds to commemorate an important villager's death, e.g., a chief; and it was reported that these closures had greater compliance than current measures due to cultural importance (Rohe et al., 2017). Similarly, in the Kei Islands, Indonesia, Sasi laut is practised, which is local knowledge that prevents the community from extracting natural resources in an area for a certain amount of time (Ananingsih, 2018). Perceptions of this vary, and can be influenced by experience, e.g., more experienced fisher's prioritised environmental objectives of Sasi laut; and, by geography, e.g., villages in subdistrict Kei Kecil valued income objectives of Sasi laut more so than those in subdistrict Dullah Utara (Hoshino et al., 2017). In contrast, Silva et al., (2015) expected divergent perceptions between immigrants and natives due to cultural differences in Brazilian SSF, but this was not found. However, they suggest this could be because immigrant fishermen came from similar communities, or due to the long time they had already been residing within the community.

## 4. Conclusion

The current review found many examples of fisheries stakeholder engagement in fisheries management and policy. However, it was apparent that most studies focused on stakeholders' perceptions about existing management and policy, rather than an appraisal of how best to use stakeholder perception-based data early in the implementation of management and policy. This lack of example highlights the practical difficulties in using stakeholder perception in fisheries management process.

The definition of perception was relatively similar across the literature, whereas stakeholder and small-scale fisheries definitions were varied. There is discussion on whether the public should be considered a stakeholder, with suggestions that to be able to have an influence, the public would need to join eNGOs. However, the example of the public's influence after the Blackfish documentary demonstrates how powerful they can be in exacting policy changes. However, the strength of public engagement varies with topic. SSF remain difficult to define due to varying definitions between countries, however there is general consensus that vessel size and gear type are the primary components used for defining SSF.

A multitude of factors were evidenced in the literature as influencing SSF stakeholders' perceptions, in particular concerning fishers. These ranged from socio-demographic factors such as age, education, and gender; but also included influences such as gear types, age-financial interactions, level of involvement and whether it's perceived as meaningful, trust, common language, and culture. Despite views that stakeholder perceptions can be dismissed because they are viewed as anecdotal, we argue their benefits cannot be ignored especially in terms of ensuring high compliance. Several frameworks for implementing their perceptions exist in the literature, and we suggest further work to examine better utilisation of stakeholder perceptions in a format that allows for them to contribute to SSF policy and management.

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