



Fisher participation in research: Dilemmas with the use of fisher knowledge

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Abstract

Fisher participation in fisheries research and management is common practice. However, more consideration must be given to the appropriateness of using participation in situations where changes to fishing policy are possible. This study evaluates fisher reactions to participation in a socioeconomic survey and reflects on some dilemmas with participation as a tool in fisheries management and research. Results highlight the perceived benefits and drawbacks of participating, and are based on participant observation during the oral administration of a survey of local fishers in the Turks and Caicos Islands as part of the ‘Turtles in the Caribbean Overseas Territories’ research project.

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1. Introduction

Contemporary fisheries management has evolved to require a broad array of socio-economic and cultural information regarding fishers and fishing communities [1–3]. Such information includes the various values (economic, social, cultural) of the fishery [4], the ways in which fishers capture and use various marine species [5], understanding of the interactions that occur between fishers and other stakeholders in the fishery [6–9], and knowledge of management strategies that may traditionally exist or have existed in a given location [2,10]. Cooperation from local fishers is required for the effective collection and synthesis of such information.

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Cooperation frequently manifests itself as participation in a broad range of research activities including focus groups, interviews, surveys, mapping exercises, and biophysical data collection. Without fisher participation in research, the ability of fisheries managers to make well-informed policy decisions is limited [1,6,11]. Furthermore, if research is linked to possible policy changes and local participation is not sought by researchers and managers, fishers are denied the opportunity to contribute to the process altogether, a situation that not only lacks justice [10,12], but that can lead to tension between fishers and government [1,13], low compliance with regulations [3,11], and policy that does not reflect the social/cultural context of the region and/or the size and scale of the fishery [2,11].

While fishers are increasingly participating in fisheries research and management, little consideration has been given to the implications of this trend, with some exceptions. For example, fishers had negative reactions towards participation in socioeconomic surveys [1,13] and on fisheries advisory panels [6], with reactions including distrust, anger, and confusion. Wilson and McCay [6] also found that fishers recognized participation in the same advisory panels as an opportunity to build capacity and mobilize their organizations for further action. Overall, however, there has been little written about why fishers might choose to participate, where their intentions lie, and what the consequences of participation might be.¹ If these questions are not considered, the so-called success or failure of participation (usually defined by managers and/or researchers) is disconnected from the quality of experience that participants take away from it. According to the broader participation literature, this disconnect would suggest that participation has not been appropriately applied [14–16].

The qualitative case study presented in this paper assesses motivations and reactions of turtle fisher participants in a research project, specifically the ‘Turtles in the UK Overseas Territories in the Caribbean’ (TCOT) socio-economic survey of turtle capture and use in the Turks and Caicos Islands (TCI). TCOT was commissioned by the UK government (UK Department for the Environment, Food and Rural Affairs and the Foreign Commonwealth Office Environment Fund for the Overseas Territories) in six UK Overseas Territories (OTs) in the Caribbean, and executed by the Marine Turtle Research Group at the University of Exeter and the Marine Conservation Society, UK. The goal of the project was to assess the status of marine turtle populations, levels of marine turtle harvest and bycatch, genetic composition of stocks, and the status of current marine turtle research, conservation and management efforts [17]. The project stemmed from UK government commitments made at the *Caribbean Hawksbill Range State Dialogue Meeting* held by Conventional on International Trade in Endangered Species (CITES) in Mexico in May 2000. Thus, data were collected to “assist the UK, the OTs and other countries in the region to support, develop and manage co-ordinated regional conservation programmes for hawksbills and other marine turtle species, and allow relevant policy makers to make informed decisions regarding future trade in marine turtles or products derived from them” [17]. One of the required outputs of the research project was policy recommendations.

The socioeconomic survey was one part of TCOT’s multidisciplinary approach² and was administered in each country by local governmental partners and TCOT staff. The purposes of the survey were: to fill in the gaps in information on turtle fishing and use and

¹Maurstad [10] is an exception, and has considered both the consequences for fisher livelihoods of revealing fisher knowledge via publications, and ethical obligations of researchers to consider such implications.

²TCOT also undertook nesting and foraging ground surveys and collected genetic samples from marine turtles.

to capture valuable local knowledge/opinions on marine turtle issues, such as population health and size, historical trends in fishing and turtle population numbers, and management options. The second author on this paper (Campbell) was a member of the TCOT research team, and led the socio-economic component of the project. The first author (Silver) assisted with administering 37 TCOT surveys to fishers in TCI, and used the opportunity to simultaneously observe fisher responses to participating in TCOT.

As well as broadening the conceptualization of participation in the fisheries literature to include the experiences of fisher participants, this paper explores the implications of involving local fishers in initiatives that have the potential to impact their livelihoods. The marine environment is important to the ecology, economy, and culture of the Caribbean region, and has been the focus of research, fishing, conservation, and tourism efforts [18,19]. Given the diverse nature of these activities, there are opposing views on the balance between resource use and conservation. In the case of marine turtles, international pressure to conserve populations often pits research and conservation efforts against activities such as fishing and other forms of consumptive use [20–23]. Therefore, while this paper explores both positive and negative responses by fishers to participation in TCOT, it is particularly concerned with how negative responses may reflect animosity by fishers towards perceived conservation goals, and how this in turn can impact the outcome of the project, the fishers themselves, and future research and/or management initiatives.

2. Participation

In order to appreciate how the theoretical benefits of participation may be outweighed by negative impacts, participation and participatory approaches as described in the literature are reviewed briefly here. Broadly, participation refers to local citizens taking part in any type of project with outcomes that may directly affect them and/or their community. In the fields of conservation and development, participation has become so much the norm that it would be hard for a project to get approval without at least some reference to involving local people [24,25]. However, although participation is a widely accepted concept, it continues to be problematic. It is not so much the idea of participation that is contested, but what participation actually entails. Debate continues regarding the why, where, how, and who of participation.

While attention to unpacking the concept of participation is relatively recent in conservation [14,26–28], this issue was raised in 1969 by American planner Susan Arnstein in her *Ladder of Citizen Participation* [29]. Arnstein's ladder shows eight levels of participation ranging from manipulation at the bottom, through consultation in the middle, to citizen control at the top [29]. As noted by Campbell and Vainio-Mattila [14] and Hayward et al. [16], the differences between the bottom and top levels in Arnstein's ladder are the desire to use participation as either a means or an end and the way that the participants are conceptualized. Pretty [28] and Barrow and Murphree [27] have adopted Arnstein's ladder to more explicitly reflect the concerns of conservation, often in a developing country context, and Pretty's typology is summarized in Table 1. What all three conceptualizations share is a sense of progression, i.e. participation at the bottom of the ladder (or typology) is inferior to participation at the top,³ and these normative typologies

³This progression is most clear in Arnstein's [29] ladder, where she categorizes the top three rungs as 'degrees of citizen involvement', the middle two as 'degrees of tokenism', and the bottom two as 'non-participation.'

Table 1
Pretty's typology of participation (summarized)

7	Self-mobilization	People take initiative independent of external institutions. May seek outside support, but retain control over resource use
6	Interactive participation	People participate in joint analysis. Participation seen as a right, not just a means. Multiple perspectives sought; interactive learning. Local groups take control of decisions and how they can be implemented
5	Functional participation	Participation seen as a means to achieve project goals, get people on side with pre-determined objectives. Some decision-making may be shared
4	Participation for material incentives	People exchange labour for some material incentive (food, cash, infrastructure)
3	Participation by consultation	People are consulted or answer questions; problems defined and analysis done by experts. No obligation to account for sought views
2	Passive	People are told what has been decided, i.e. 'educated' or informed. Information sharing is one way
1	Manipulative	Participation is a pretense; e.g. people on representative boards, but unelected and without power

Pretty (1995).

facilitate the critique of participation in practice [11,26]. The assumption that certain types of participation are always, by default, superior to others has recently been challenged by Hayward et al. [16], who argue that non-participation or peripheral participation may be valid and legitimate choices in some instances, and by Cooke and Kothari [26] who question the demands made of participants in situations that sometimes involve limited payoffs. Regardless, it is clear that participation can mean many things to different people, especially when the term is employed without definition and uncritically [30].

2.1. *Participation in fisheries*

Management trends in fisheries have followed the movement towards increasing local participation seen in the broader fields of conservation and development, but at a 10–15 years delay [31,32]. There are several reasons for participation catching on later relative to, for example, participation in the management of forests. These include the strong biological/positivistic tradition in fisheries management [2,7], the high level of government involvement in regulating and allocating the fishery (due in large part to the notion of fisheries depletion as a tragedy of the commons) [32,33], the belief that there was an abundance of fish available for capture, and the low regard in which fishers/fishing communities have often been held [32,34]. Simply put by Wilson and McCay [6, p. 41], many fisheries managers saw inviting participation by fishers as allowing the “foxes to guard the henhouse”.

It has increasingly been argued, however, that fishers can and should participate in fisheries research and management [2,6,7,13]. Supporting this argument is the vested interest in the longevity/prosperity of the stocks that fishers/fishing communities have, the local institutions for management and conservation that may already exist amongst fishers, as well as the knowledge fishers accumulate throughout a career [7,11,35]. While any of these assumptions may be challenged at the case study level, the exploitation, decline, and

in some cases, collapse of numerous species of fish worldwide during the last 20 years [2,36], even in the presence of the best science available, has undoubtedly prompted managers to rethink their strategies [2,32,33,37–39].

There are three broad areas where participation has been applied most often in fisheries: management, enforcement, and research. First, fishers have been involved with management by defining future directions and policy, creating and participating in community conservation programs, and contributing valuable socioeconomic information, all of which diversify a field that has traditionally been dominated by scientific management [34,40,41]. Workshops, focus groups, and advisory councils/boards are all popular methods to achieve participation in this area, with community-based resource management/conservation being the ultimate goal [13,35,42–44]. Second, fisher participation in enforcement activities has become an alternative that in some instances increases compliance while decreasing the amount of governmental effort necessary [11,42,45]. Participation in self-policing or enforcing relies on the influence of group norms and traditional hierarchies to encourage compliance, and requires high levels of trust, cooperation, and communication between the stakeholders involved. Finally, fishers have participated in research by collecting samples, providing first-hand knowledge on fish stocks and cycles through surveys and interviews, and defining and testing questions for surveys [13,40,41,46].

While Jentoft and McCay [34] and Jentoft [11] have argued that participation in all three of the above areas can improve the overall management of a fishery, and thus the likelihood that all stakeholders involved (government, fishers, processing plants, etc.) will be satisfied with any resulting initiatives [11,34], it is important to recall the different forms that participation can take; in any one of these three areas, participation can vary as discussed by Arnstein [29], Pretty [28] or Barrow and Murphree [27]. To a certain extent, participation has been treated uncritically in the fisheries literature, and most discussions of participation in fisheries fail to incorporate the broader participation literature. One way to more critically assess participation in fisheries management, enforcement, and research is to try to understand the experiences of the participants themselves. Such understanding will not only help assess a specific instance of participation according to Pretty's typology (or any of the others), it can also help improve participation as it is promoted and applied by managers and researchers, and as it is experienced by local fishers.

2.2. *Participation in TCOT*

Fisher participation in the socioeconomic component of TCOT was primarily restricted to answering a questionnaire. During early field visits to TCI, TCOT staff engaged in informal discussions with fishers and informed them regarding the upcoming survey. While these informal discussions may have influenced the content of the survey to some extent, the survey was driven primarily by the mandate of the project, which in turn was determined by UK commitments to the CITES *Caribbean Hawksbill Range States Dialogue* process. Thus, fishers participated in the research as respondents and TCOT's primary aim was to acquire their knowledge. There is also an explicit recognition in the TCOT project report regarding the necessity of engaging fishermen in research and policy-making, as a means of increasing their support for and compliance with any changes to existing laws, and a section of the questionnaire did seek fisher input on potential

management options [17]. Thus, participation in TCOT can be described as *consultative* or perhaps *functional* according to Pretty's [28] typology (see Table 1). Consultation in particular is common in conservation due to the relative ease with which it can be conducted, and the valuable information it can yield [1,10,40].

If we reject the normative assumptions underlying participation typologies, i.e. that participation is by definition always better at higher levels, then it is possible that this type of participation may be legitimately implemented, provided that the intent of consultation has been adequately communicated to the participants, participation is voluntary, risks are clearly outlined (including the potential for the results to put the livelihoods of fishers in jeopardy), the results of research are returned to and ideally approved by participants,⁴ and the project does not claim that its use of participation is further up the scale than it actually is [1,10]. For example, suggesting that this type of participation might build capacity and empowerment amongst the participants would be questionable. Furthermore, acquiring knowledge from participants, even if ranked low on participation scales, theoretically allows participants the opportunity to provide feedback and criticism regarding the project itself, thereby increasing their 'say' [1]. Observing participation in TCOT was a means of recording this feedback.

The remainder of this paper will describe the case study of fisher participation in TCOT's socioeconomic survey on marine turtle use and capture. It will describe the reactions that fishers had while participating in the project, and discuss how these reactions relate to the form of participation implemented through TCOT and the implications of these results for understanding participation in TCOT specifically, and in fisheries research more generally.

2.3. Field site

The Turks and Caicos Islands are a group of islands in the British West Indies situated 924 km southeast of Miami with a total population of approximately 20,000. As a UK overseas territory, TCI maintains financial, military and political ties with the UK. TCI's economy is based mainly on offshore banking, tourism, and fisheries [47]. The most important commercial species to the fishery in TCI are the queen conch (*Strombus gigas*) and the spiny lobster (*Panulirus argus*), with various finfish and reef fish also being popular for local sale [5]. Sea turtles are also amongst the species fished legally, and are captured by local fishers mostly on an opportunistic basis for subsistence purposes, although there is some commercial sale to local restaurants [17]. There are quota restrictions on the take of queen conch and lobster, but these are placed on the fish plants rather than the fishers, making the fishery quite *laissez-faire* in nature [8].⁵ There are no quotas on turtle capture and fishers may capture turtles year round. The only restrictions include a minimum size limit, a ban on the use of certain types of nets, and a law that prohibits the collection of turtle eggs from beaches. As a result of the TCOT socioeconomic survey, Godley et al. [48] estimated that between 420 and 2035 marine turtles per year are currently captured in TCI.⁶

⁴In a TCOT follow-up grant proposal, funds were requested to facilitate sharing research results with partners and participants through a workshop and outreach. However, this portion of the grant was not funded, and results will be returned only via final reports, thus limiting the accessibility of the findings to local stakeholders.

⁵The fish plants must stop processing after a maximum total weight has been reached.

⁶This range represents the combined estimate of captured green (236–1128) and hawksbill (184–907) turtles.

The majority of TCOT fisher surveys in TCI were administered on South Caicos Island, because of the high density of fishers located there. South Caicos is one of eight inhabited islands and cays in TCI and is home to a high concentration of fishers due to its prime location on the shallow Caicos bank. Compared to the rest of the country, it has remained relatively untouched by tourism and other development [5]. Of the 800–1000 residents of South Caicos, approximately 120 are licensed to fish commercially and a substantial unknown number work in three different fish plants that process, package, and export conch and lobster landings on site [5]. Altogether, 70% of the active work force in South Caicos receives some amount of employment related to the fishing industry at some point throughout a given year [5].

2.4. *Turtles in the Caribbean Overseas Territories (TCOT)*

As stated above, fisher participation in TCOT was largely determined by the structure of the overall project and its predetermined objectives, as linked to the UK's commitments to the CITES *Caribbean Hawksbill Range States Dialogue*. Nevertheless, from the outset of the project, the TCOT research team recognized the importance of involving local government partners and other stakeholders with vested interests in various consumptive and non-consumptive uses of turtles to both achieving the work of the project and increasing the chance that it would continue following its formal completion [49]. Towards involving local stakeholders, TCOT staff discussed fisheries issues and the upcoming socio-economic questionnaire with fishers, particularly in South Caicos, during two preliminary field visits. The local governmental partner in TCI was the Department of Environment and Coastal Resources (DECR), and two DECR staff members participated in a regional workshop where the questionnaire was developed [50]. The same staff were charged with administering the questionnaire to local stakeholders, including fishers.

The TCOT questionnaire had nine sections of questions. The first two sections collected demographic and background information, while the last-posed questions surrounding the conservation of turtles; all three were administered to all participants. The remainder were posed to the participants based on whether or not they fell into the categories of fisher, egg collector, vendor (direct or indirect), or consumer. Questions sought specific knowledge in each respondent category, and fishers often answered more than one, as they were often also vendors and consumers.⁷ The questionnaire was orally administered to all participants due to its length and complexity [17], and this made the dynamic of questionnaire administration similar to that of a highly structured interview.

3. Methods

First author Silver assisted local DECR staff with the administration of 37 TCOT surveys to fishers in TCI between May 3rd and June 14th, 2003.⁸ This provided the opportunity for direct participant observation during each survey as well as during informal interactions with fishers outside the context of TCOT. Approximately, 5 weeks were spent in South Caicos, one week in Grand Turk, and one day on Salt Cay. Thirty of

⁷A copy of the TCOT survey is available at: <http://www.seaturtle.org/mtrg/projects/tcot/finalreport/quest.shtml>

⁸In total, 59 fishers were surveyed by TCOT staff members and partners. A total of 92 surveys were administered to all stakeholders (including fishers) in TCI.

the 37 surveys were conducted in South Caicos, 4 in Salt Cay, and 3 in Grand Turk. The reactions by all 37 fishers are included in the results.

Facilitating DECR's administration of the TCOT surveys was an ideal role for the researcher as it allowed her access to the fishers as well as an inside perspective on the DECR. While fishers were aware of the researcher's connection with DECR and the TCOT survey, many of them also spoke with ease about the fishery during informal and social interactions. Notes on actions, conversations, and observations were taken throughout daily work, and put into a consistent field note format on a nightly basis, as recommended by DeWalt and DeWalt [51]. This consistency served to improve accuracy of recording data and data analysis. Three levels of field notes were taken: daily events notes, survey notes, as well as community context and weekly wrap up notes. Pseudonyms are used for all individuals quoted from notes in order to protect anonymity.

Daily events notes recorded issues of importance to fishers on South Caicos, as discussed outside of the context of the TCOT survey. These notes were key to understanding the relationships among stakeholders in the community. Survey notes recorded reactions of and interactions between all parties involved during the administration of each individual TCOT survey. It is important to stress that daily events and survey notes focused on recording factual data (i.e. what a fisher said) rather than the researcher's interpretation of meaning. Finally, weekly wrap up notes served to highlight key events related to the research, while the community context notes served to highlight features of the community that might help to explain aspects of fisher participation or the fishery. This paper draws on data from daily events notes (referenced as DE with date, e.g. DE June 2nd) and survey notes (referenced by survey number, e.g. Survey #654).

The paper describes the reactions of fishers to participation in TCOT. Reoccurring reactions as described in daily event and survey notes were first coded as positive or negative, then further coded into sub-categories. The software QSR NVivo (version 2) was used to facilitate analysis. Data analysis was driven by grounded theory [52–54], where categories of reactions emerged from the data themselves, and these categories drove the theorizing about fisher responses to participation. Results are presented below using a combination of response frequency tables and representative passages taken from daily events and survey notes.⁹ We recognize that it is uncommon for researchers to quote their own field notes in publications. However, we feel that this approach increases the transparency of research results based on participant observation, as it allows the reader to see the 'raw data' (in this case, daily events and survey notes) and assess the strength of conclusions made based on such data.

4. Results

The categories of fisher reactions discussed below include: two sub-categories of positive reactions (*polite and social* and *benefits of participation*); two sub-categories of negative reactions (*irritated, distracted, and anxious*, and *negative associations with participation*); and a variety of sub-categories that illustrate some dilemmas with using fisher participation

⁹This convention follows a combination of work presented by, but not exclusive to Gray, [55], Gilden and Conway [1], and Wilson and McCay [6]. These works qualitatively represented the experiences of eco-tourists, fishers, and local community members, making them ideal points of reference for the structure of the findings presented in this thesis.

as a tool in fisheries management and research (*refusals to participate, provision of false information, comments on illegal activity, and defiance towards changes in regulations*).

4.1. Positive reactions

4.1.1. Polite and social

Polite and social responses to survey participation were considered positive because they often related to the surveys that were easiest to administer, where discussion flowed the freest, and where fishers seemed the most content. However, the intent on the fishers' part to receive tangible benefits from participation, if present at all, was not obvious to the researcher. Fishers in this category ranged from those who seemed to want to contribute to the success of the project for the sake of the researcher or DECR official (rather than themselves), to those who appeared happy to talk with someone for a period of time. Twelve fishers had reactions to participation categorized as polite and social, as illustrated in the following three excerpts from survey notes:

We thanked him [interviewee] for the interview and he said that it wasn't a problem and he hoped that it would help out (Survey #692).

He [interviewee] said that he really hoped that I would learn something here and that it would be successful (Survey #677).

The subject had lots of information and opinions about cycles of fish/lobster/conch and turtles that became obvious as he elaborated on most questions. He liked to share stories about when he was fishing (he was a retired fisherman). There are only a handful of fishermen on Salt Cay, so perhaps he does not get to talk about fishing as often (Survey #730).

Even though these reactions did not indicate that fishers sought tangible benefits from participating, it is important to recognize that such positive social interactions with government officials and researchers can improve relations and future interactions.

4.1.2. Benefits of participation

Positive associations with participation shed light on one of the larger questions posed by the research—what do fishers see as the benefits of participation? In the case of fisher participation in TCI, many fishers recognized the significance of their participation, and further, how they might be able to benefit from it. Table 2 summarizes the perceived benefits of participation and the number of fishers who noted them.

The most common positive reaction to participation reflected the belief that participation in TCOT provided an opportunity for communication and knowledge sharing (Table 2). A total of 10 fishers had this reaction, with six making reference to the value of their knowledge and information to researchers and policy makers. To these fishers, the TCOT survey was recognition of their knowledge, as well as a forum in which they could share it.

I told him what the survey was about, and he [interviewee] said 'right, I've been expecting something like this for quite some time now.' I asked what he meant and he said that he knows the government is interested in turtles, and they are important

Table 2
Reactions demonstrating beliefs about the benefits of participation

Category	Number of fishers (of total $n = 37$)
Communication	10 ^a
Fishers have valuable info	6
Communicate with government	5
Value of turtles	6 ^a
Fishery/Livelihood	4
Social/Cultural	4
Tourism	1
In return for something	6 ^a
Flirtation	4
Favour	3

^aTotals for categories do not equal the sum of fishers identifying sub-categories, because fishers may have demonstrated more than one sub-category reaction. E.g. a fisher may have expressed the belief that fishers have valuable knowledge and that TCOT represented a chance to communicate with government. The fisher is counted in each sub-category, but only once in the overall category of communication.

internationally. It did not surprise him to be asked about turtles, because the fishermen are the ones with the most knowledge on them (Survey #772).

Five fishers indicated that the survey was an opportunity to communicate or open up dialogue with the government specifically, whether it was regarding turtles or fisheries in general:

He [interviewee] hoped that participating in a survey like this would help the government to better understand the situation of the fishermen (Survey #692).

Six fishers stated that they thought participation in TCOT was important because of the value of turtles to people in TCI (Table 2). Of the six fishers, four mentioned that they agreed to participate either because turtles were important to the fishery or because it was important to them to be able to go out and catch one when they desired. Four more fishers indicated that they felt it was important to participate because of the value that turtles have to the culture and society of people in TCI. For example, one fisher said:

... that he appreciated what I was trying to do here with the turtles because it was important to him that they be around in the future for his son to learn how to dive (Survey #770).

One fisher mentioned the value of turtles to local tourism.

Finally, six of the fishers who agreed to participate asked to receive something in return. In four instances, the interviewee used participation as an opportunity to flirt with the researcher or the DECR official.

He [interviewee] said that he was glad to talk to me, and even happier that he got to talk to a pretty girl for a while (Survey #772).

Three fishers offered to participate or help TCOT by bringing turtles in for genetic sampling, but only if a favour would be completed for them first. As the sample quote below suggests, these favours could be quite practical:

She [DECR officer] asked him if he would mind being interviewed, and he [interviewee] said ok, as long as we would drive him to Trenchtown [a local bar] to get another beer. We said ok, and that we would interview him at the DECR office (Survey #767).

4.2. *Negative reactions*

4.2.1. *Irritated, distracted, anxious*

In contrast to reactions by fishers that were cooperative and polite, some fishers agreed to participate in the survey, but made it obvious that they were not happy to be doing so. Often fishers were visibly irritated, distracted, and/or anxious from the onset of the survey, making completion of the survey challenging and, at times, affecting the quality of the data collected. For example, almost all fishers were approached in the harbor, after returning from a morning of fishing. While this is a general gathering place for relaxing and conversation, it was often the case that fishers were busy, and thus the time required to finish the survey was an issue:

He [interviewee] protested and said that he didn't have time right now... He kept asking how many questions were left and eventually said that he had to go over to the other side of the dock to fix something on his boat, and that if we wanted to finish the interview that we would have to come over there. He was a little calmer over there because he was waiting on the guy to fix his motor (Survey #682).

Some fishers were distracted or interrupted by friends or other onlookers:

This survey was problematic because, as it went on, other fishermen that he was cleaning with kept speaking up, trying to answer his questions for him, and were in general interfering with the process. He [interviewee] seemed not to mind though, because I don't think that he wanted to answer the questions to begin with (Survey #762).

Others were put off by the pressure the DECR officer sometimes put on fishers to participate:

He [interviewee] was in the middle of cleaning a shark, and looked quite busy as well. He said that he didn't want to participate right now, and that he would prefer not to do it at all. The subject finally started to answer [the questions], but was clearly making a joke of them and answering them incorrectly. The DECR official was getting a little annoyed, but so was the fisherman (Survey #689).

Further, at times fishers made light of the survey, by mocking the questions or being overtly sarcastic with their answers:

When we asked him [interviewee] his age he said that he was 23 (which he obviously wasn't). He was making up answers and giving us a hard time... So I wasn't really sure if he ever was taking it seriously or if the answers he gave were truthful (Survey #740).

More than anything, these negative reactions made survey administration additionally taxing on DECRC officials and/or brought the accuracy of the data collected into question. While these reactions weren't always associated with concerns about TCOT or participating in it, there is the possibility that they were connected to or masked more substantive negative feelings about TCOT. That some of these fishers also expressed more direct concerns (discussed below) suggests this was the case for at least some fishers. Additionally, negative interactions such as these have the potential to discourage future cooperation from fishers and/or put a strain on the relationships that they have with government.

4.2.2. *Consequences and purpose of participation*

While the above discussion refers to the temperament of fishers during survey administration, negative reactions relating to the consequences or purpose of participation speak to the concerns that fishers had about research projects and their participation in them. Table 3 summarizes these negative reactions.

The largest single response to participation in the TCOT survey, positive or negative, was distrust in some aspect of its intent ($n = 18$ fishers, Table 2). Eleven fishers were generally concerned with where the information from the survey would go:

He [interviewee] did want to know what was going to happen with the information that was being collected by this survey so we explained to him again about the UK government and that the info would be coming back to the DECRC (Survey #691).

Nine fishers voiced a concern that the turtle fishery would be shut down based on the results of the survey:

He [interviewee] said from the start that he hoped this survey didn't mean that they were going to be closing the fishery down or anything because, even though he didn't fish for turtles that often, it was still very important to him that he and others from TCI be able to catch a turtle if they wanted one... At the end of the interview when I

Table 3
Reactions demonstrating concern for consequences and purpose of participation

Category	Number of fishers (of total $n = 37$)
Distrust	18 ^a
Concern for where information is going	11
Trying to close fishery	9
Trying to catch illegal activity	3
Concern for identity	2
Low focus on turtles in fishery	14
Why turtles?	9
Turtles not important personally	5

^aTotals for categories do not equal the sum of fishers identifying sub-categories, because fishers may have demonstrated more than one sub-category reaction. E.g. a fisher may have expressed concern about where information collected by TCOT was going, and concern that TCOT was trying to close the fishery. The fisher is counted in each sub-category, but only once in the overall category of distrust.

asked if he had any questions he did not, but just said that he hoped the turtle fishery would not be closed (Survey #775).

Three respondents were concerned that the purpose of the survey was to try and catch illegal activity:

He [interviewee] wasn't angry about it or anything, but just concerned that his participation might be putting himself and others in jeopardy, and wanted to be clear that I was a student and not some kind of government worker or something (Survey #681).

Finally, two of the subjects wanted to confirm that the researcher was not an individual from the UK government, and that their names would not somehow be revealed to anyone in the government:

Overall he [interviewee] was cooperative and helpful with his answers. He did want to know where all of this information was going. He also wanted to confirm that his name would not be attached to anything that he said (Survey #773).

The above responses are problematic both in what they say about fisher concerns regarding participation and due to the ethical issues they raise. The TCOT survey was prefaced with a lengthy introduction that explained the purpose and sponsorship of the project, guaranteed anonymity for respondents, and stressed the voluntary nature of participation. In spite of this introduction, fishers' concerns remained. This may have been due to administrators not spending adequate time on the introductory information, or because the individual was not paying attention. Furthermore, it suggests that initial field visits by TCOT staff did not create the desired familiarity with the survey. The potential repercussions of these reactions for overall reactions to TCOT and for fisher participation in general will be discussed further in the concluding section of the paper.

The second category of responses concerned fisher reactions to the purpose of the survey. A number of the fishers ($n = 14$) were confused and or frustrated by the research focus on marine turtles; they felt that attention would be much better focused on the queen conch or spiny lobster. As the cornerstones of the fishery in TCI, these species face intense extraction pressure, and fishers have a high economic interest in their successful management. Many of these fishers commented that they would have taken the survey more seriously had it been focused on lobster and conch. Nine responses indicated that, because turtles are not central to the fishery for anyone in TCI, the individual could not understand why so much information on them was being collected.

He [interviewee] said a couple of times that he did not see the point of having such a long survey about turtles when they are not the focus of the fishery in South (Survey #771).

Another 5 respondents pointed out that they personally did not capture turtles, so they could not take the survey seriously. The following quote illustrates how such negative responses interacted with negative temperament.

As far as interest in participation, this fisher seemed kind of annoyed at the length of the survey, and showed some confusion as to why we would be interested in turtles. He himself said he wasn't too interested in turtles. This kind of showed as the

beginning part of the survey went on because he kept asking if it was almost over yet (Survey #766).

4.3. Dilemmas with fisher participation

Aside from the positive and negative reactions to participation in TCOT, there were other reactions that exemplified some of the dilemmas with fisher participation that have been identified in the literature. Broadly, these dilemmas can be categorized as dilemmas with the reliability of data collected from fishers [1] and dilemmas surrounding the ethics and politics of using and publishing fisher knowledge [10].

4.3.1. Data reliability

The reliability of socioeconomic data collected from fishers rests directly on the willingness of participants to contribute to research, and on the validity of the information that they provide. During the administration of the TCOT surveys in TCI, there were instances that brought both of these variables into question. There were several fishers who, during the time the researcher spent in the field, refused to participate in the TCOT survey. The option to refuse should always be given to human research subjects, and refusal is a legitimate option researchers are obliged to respect. Nevertheless, refusals are problematic, and if they are frequent or come from key individuals, the completeness of the data set can be questioned. While overall refusal rates were low in TCI (7%) [48], two key individuals in the turtle fishery refused to participate while the researcher was in the field.¹⁰ There were also several fishers who agreed to participate, but provided information that was at times obviously false. Cases of refusals and falsification are discussed below.

The researcher encountered both one-time and on-going refusals. The one-time refusals came from fishers who said that they did not have time or interest in the project, and while this can be considered a negative response to participation, interactions with these fishers were too limited to probe the basis of the response. There were also repeat and on-going refusals, where individuals agreed to participate in general, but did not follow through on specific occasions. Two of the most well-known turtle fishers¹¹ on South Caicos repeatedly refused to participate, although the researcher interacted with them frequently. Both were full-time, financially successful turtle fishers and therefore had a vested interest in the turtle fishery. Because of their success, they also had the admiration of many others. Upon arrival on South Caicos, the researcher received several recommendations from a variety of individuals that Adam and Joe were the best fishers to talk to about turtle fishing in South Caicos, as shown in recorded daily events notes:

She [local resident] said that they [Adam and Joe] are both really good guys, and that I shouldn't take it seriously if they give me a hard time, or say that they'd rather not be interviewed. She says that we [TCOT] need to talk to them though because they have been fishing 15 plus years, are very smart, and have a lot of wisdom about the fishery and South in general. However, both of them are very secretive about their

¹⁰One of the two was eventually surveyed three months later during a short follow-up visit by a TCOT staff member.

¹¹For the purposes of the dialogue surrounding the repeat and ongoing refusals, these two individuals have been assigned the pseudonyms Adam and Joe.

knowledge, both with other fishermen, and with outsiders who are doing studies (DE May 20th).

I...wondered if there was anyone that he [DECR official] thought I should interview. He asked if we had gotten Joe and Adam yet. I told him that I knew who they were and I had talked to them, but they hadn't agreed to do the interview yet. I said how we've told them about it, and they have just said that they didn't want to be interviewed because they were busy. He laughed at that, and said that they are the guys to talk to because they bring in a lot of turtles (DE May 29th).

It was obvious that Adam and Joe would have been key participants because of their experience as fishers as well as the numbers of turtles they were rumored to capture. However, beyond continuing dialogue and making appointments to undertake the questionnaire, there was little that could be done to ensure their participation. As such, it had to be acknowledged that, although a sufficient number of fishers had participated in the survey, information from the most frequent turtle fishers was missing from the results.

There were also fishers who agreed to participate, but provided information that appeared to be false. It was evident that incorrect information was being provided when the individual would directly contradict answers that he had given to previous questions, become visibly flustered/sarcastic when answering questions, or make statements that were obviously not true.

The subject [interviewee] was agreeing with whatever statement he thought we would want. For instance he said that he thought the turtle fishery should be stopped (when he had turtle shell hanging on his wall) and that local people should not be allowed to buy turtle meat (after he agreed with the statement that turtle should be used for food and tourism). It was so obvious he was not even thinking about the statements because he was answering yes before he even heard all of the options... When we got outside after the interview even [the DECR official] commented on the fact that he [the interviewee] was lying through his teeth because she knew that he ate turtles all the time (Survey #690).

I'm not sure I even believed much that he [interviewee] was saying. He kept changing his mind on things and even said that he doesn't eat turtle anymore. Overall he was one of the most flustered interviews I've done and he was obviously uncomfortable with us being there (Survey #738).

In these instances, the administrators noted the discrepancies, but did not confront the fishers. Whether or not falsification was intentional or arose out of confusion is difficult to say, but it nevertheless calls data quality into question.

4.3.2. *Politics and ethics in the use of fisher knowledge*

In many cases, fisher knowledge collected via participation is used by decision-makers when new and/or more restrictive policy is being considered, or to legitimate a policy that has reached the implementation phase [1,6,10,11]. Therefore, researchers and managers must consider the implications of using information that has the potential to negatively affect the individuals from whom it came.

In TCI, fishers were asked to comment generally on illegal turtle fishing activity in the area in the presence of officials from the DECR (although officials had no enforcement

responsibilities). Most fishers would comment generally on such activity, but there were four fishers who provided information that demonstrated their personal participation in illegal activity:

He [interviewee] did admit to currently collecting eggs from the beach, however, I don't think that he even knew that it was illegal. The DECR official almost said something to him during the interview, but she regained her composure, and kept asking him that section. It's hard to believe that a fisherman would knowingly admit in front of a DECR officer that they are still partaking in an illegal activity if they actually knew that it was illegal. Either this or the fishermen feel so comfortable with the fact that they will not be prosecuted, that they will openly admit to it (Survey #764).

While the fishers who participated were assured that their names would not be attached to the information that they provided and that no legal repercussions would result, the provision of this information gives managers every incentive to tighten enforcement and/or strengthen regulations.

Many fishers recognized the possibility that TCOT would mean changes to the policy that regulated the turtle fishery. They were defiant in the sense that they challenged changes to regulations and the 'conservation at any cost' attitude that they perceived many scientists to have. Even some of the most cooperative fishers noted that if turtle fishing was regulated or outlawed, they would still continue to capture turtles.

Before we even got started, he [interviewee] asked if I wanted to shut down the turtle fishery, and I said no. He said good because if I told him tomorrow it was closed, he would take twice as many turtles as he does now (Survey #763).

The subject [interviewee] was in his thirties and was quite enthusiastic to talk to us, but right off the bat he said that we'd better not be trying to close down the fishery. He said that even if they did he would keep fishing turtle anyway (Survey #681).

These statements indicate that if new regulations regarding the turtle fishery are put in place¹² instances of non-compliance can be expected. Additionally, stricter regulations may impact on the perceptions that fishers have of researchers and encourage non-cooperation with future research. If such impacts are to be minimized, any new regulations regarding the turtle fishery must be implemented, at the very least, in conjunction with high communication between government and fishers.

5. Discussion and conclusions

Fishers acknowledged TCOT as an opportunity to have their say, contribute their knowledge, communicate with the government, and help conserve turtles for future use. These positive associations with participation correspond with those found by Wilson and McCay [6]. Conversely, TCOT was also seen by some fishers as a project designed to justify tighter regulations on the turtle fishery and/or catch fishers in illegal activity, and fishers were concerned with how the data would be used. Distrust of participation in research

¹²TCOT has recommended tighter regulations on the marine turtle fishery in TCI in the form of a 6–10 month closed season and maximum size limit, Godley et al. [17].

projects was also found by Gilden and Conway [1] and Wilson and McCay [6]. Furthermore, in the opinion of many fishers, the efforts of TCOT might have been better spent on species of more economic significance to fishers in TCI. Reactions to participation that included the falsification of answers, confession of illegal activity, defiance towards pending changes in regulations on the turtle fishery, as well as key fishers repeatedly refusing to participate illustrate both practical dilemmas with fisher participation and the existing unease that fishers in TCI had with research into the fishery. The implications of these results will be discussed below.

5.1. Implications for fishers and participation in TCI

When fisheries managers consider using participation as a research or management tool, they need to consider how fishers' perceptions of the initiative and dilemmas with participation might affect the outcome and/or negatively impact on future research initiatives. As well, the sensitivity of the knowledge collected via participation must be recognized when considering how it will be applied in policy formulation and/or academic publication [10]. Even though participation is often used with the intention of bringing fishers into a research and management process from which they have historically been excluded, it has the potential to further disenfranchise them. Participation may put a strain on the relationship between fishers and government/researchers and discourage participation in future initiatives if information sought from fishers is not incorporated into policy recommendations. If fishers feel that they have been taken advantage of, or that the information that they provided has been used against them, further distrust is probable [1].

These concerns are a reality in the context of TCOT in TCI. TCOT's mandate included making policy recommendations for the fishery. Since the turtle fishery in TCI was virtually unregulated at the time of the survey, it was perhaps inevitable that TCOT would end up recommending more stringent regulation. This likelihood was further increased when information provided by fishers suggested that levels of turtle fishing were higher than originally believed. Thus, the final TCOT report contains recommendations for stricter regulations on the marine turtle fishery. Specifically, a 6–10-month closed season and maximum size limit have both been proposed [17]. When administering the TCOT survey, researchers informed fishers that the data would be used by the government and of the likelihood of changes to policy. Nevertheless, research results presented above suggest that this information was often not fully absorbed by fishers. Thus, the potential that fishers may feel betrayed by the outcome of TCOT exists. Towards addressing this potential, TCOT has also advised that, if the UK and TCI governments should choose to implement any new policy, fishers be consulted extensively throughout the formulation and implementation processes. It was additionally recommended that a multi-stakeholder board be formed to help manage the fishery regardless of any new policy [17]. Whether or not fishers will appreciate such efforts (if pursued) is unknown.

It has yet to be seen whether the government will choose to apply new policy to the turtle fishery in TCI, or if fishers will be involved further in the process. This choice ultimately rests with the government, specifically the DECR, a department that is currently understaffed and overworked [17] and seems to have a relationship with fishers that is at times tenuous [8]. However, fisher reactions to participation in the TCOT survey presented here indicate that the potential for anger, distrust, and non-compliance in reaction to new regulations is high. Undoubtedly, these feelings would be magnified if new regulations

were unveiled without consultation and/or efforts to involve fishers. Furthermore, such negative feelings, if unresolved, have the potential to be transferred towards any other requests for participation by fishers in TCI in the near future.

5.2. *Participation in fisheries research/management*

The findings from this research indicate that participation, even when well intentioned, may be problematic, especially from the perspective of local fishers. This sentiment has been resonating in the participation literature for several decades [14,16,26], but has yet to be resolved. In part, the problem stems from the widespread emphasis on participation, without clarifying what form participation will take. Furthermore, as the TCOT case study in TCI shows, participation takes place in a context and this context influences the form of participation pursued. In this case, the important contextual factors were three-fold: (1) the purpose of the project was dictated by the multi-national *Caribbean Hawksbill Range States Dialogue* and the UK's commitments to it; (2) the project had a regional focus, encompassing six overseas territories, and this limited the extent to which country based research could involve local stakeholders, like fishers, in meaningful ways; (3) the TCOT team was contracted to collect data and make related recommendations, but could not guarantee any outcomes from this process, as implementation of changes will ultimately rest with governments. These factors combined limited the form that participation could take, such that participation was at best *functional* according to Pretty's typology. While, like Hayward et al. [16], we accept that participation does not always have to occur at the highest levels (and that it sometimes might be desirable to have participation at lower levels), some of the problems evident in fisher reactions to TCOT were, nevertheless, linked to the form that participation took. For example, that fishers objected to studying species that were relatively unimportant economically reflects the lack of input they had into problem definition. Furthermore, that they remained concerned regarding the purpose of the project and how the information would be used, in spite of being given information on these issues during surveys, reflects their lack of engagement in early stages of the project. Even though TCOT staff attempted to engage fishers during preliminary field visits that were costly in both time and money, fishers for the most part did not connect such visits to the survey when it eventually transpired. As discussed above, fisher concerns regarding the purpose of the project could be particularly problematic if fishers feel betrayed when and if turtle fishery regulations are changed.

The normative participation typologies suggest that, ideally, research relying on information provided by local fishers should involve them at all stages of the research initiative, from project and research question formulation, to data collection, to policy formulation, implementation, and monitoring. In reality, much participation takes place at lower levels (either for convenience, due to contextual factors, or because participation is seen as politically expedient) and, in such cases, it is important to know what the implications of participation are for both participants and for project outcomes. Continued uncritical use of participation, for whatever reason, has the potential to backfire in the future, as fishers become increasingly dissatisfied with both experiences of participation and project outcomes. Thus, they may increasingly refuse opportunities to participate, provide falsified information, and/or defy enforcement or new policy. Given that fisheries managers have been encouraged to engage fishers towards improving fisheries management, such a backlash would be unfortunate.

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