Best Practices for Caribbean Fishers Coping with *Sargassum* Influx Events

Mejores Prácticas para los Pescadores del Caribe que se Enfrentan a los Eventos de Afluencia de *Sargazos*

Meilleures Pratiques pour les Pêcheurs des Caraïbes Confrontés aux Événements D'afflux de *Sargassum*

RICHEDA F. SPEEDE*, SHELLY-ANN L. COX, and HAZEL A. OXENFORD
Centre for Resource Management and Environmental Studies (CERMES),
Faculty of Science and Technology,
The University of the West Indies, Cave Hill, Barbados.
**richedaspeede@gmail.com*

EXTENDED ABSTRACT

Beginning in 2011, and reoccurring in 2012, 2014, 2015, and at present in 2018, unprecedented amounts of *Sargassum* have been arriving along the coasts of many Eastern Caribbean islands, raising a number of socio-economic concerns for coastal stakeholders, especially fishers. These influx events have triggered much speculation about the impact on small scale fishers' livelihoods and their ability to cope and adapt to present and future influx events. However, due to the uncertainty of the extent of *Sargassum* influxes and the varied local impacts, science and management are currently lagging behind (Cox et al. 2018). Conceptually, enhancing adaptive capacity and enabling self-organization are key dimensions in developing resilience in fisheries social-ecological systems. The goal of this study was to record the challenges facing Caribbean fishers during *Sargassum* events, examine their responses and provide recommendations for coping and adapting to future events.

Stakeholder interviews were carried out with fishers, and key informants representing National Fisherfolk Organisations, Fisheries Management Authorities and Non-Governmental Organisations who were being impacted by, or involved in the management of *Sargassum* influx events. Interview participants were from eleven Eastern Caribbean countries, including Barbados, Anguilla, Antigua and Barbuda, Dominica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and Trinidad. Fisher interviewees represented primary fishery types including: the offshore pelagic fishery represented by iceboat, dayboat, longline, recreational and charter fishers; the coastal pelagic fishery represented by seine fishers; and the reef-associated fisheries represented by spear, pot and conch fishers. Interviews sought to identify the challenges faced by fishers both at their landing sites and at sea, the coping and adaptive strategies used for dealing with such challenges, and governmental and non-governmental initiatives for management of present and future influxes.

NVivo Qualitative Data Analysis Software was used to categorize and classify interview responses based on themes which included challenges at landing sites, challenges at sea, smart fishing practices, technological innovations, and recommendations. This content, along with drawings provided by interviewees, will be incorporated into a best practice handbook to be widely distributed to Caribbean fishers and fisheries management authorities, offering effective social and technological innovations and strategies tailored to specific fisheries.

A total of 47 persons participated in the research including 32 fishers and 17 key informants. Participants identified numerous physical challenges at landing sites and at sea, resulting from *Sargassum* influx events. Challenges reported at landing sites included: difficulty launching tenders (reported by 47% of all participants); restricted maneuverability of fishing boats in inundated bays and harbours (19%); blocked water intakes (19%); tangled propellers (7%); injuries from walking in/on the seaweed (4%); and difficulty swimming to moored boat (4%). Physical challenges reported at sea included: blocked water intakes (reported by 14% of all participants); fishing gear rendered ineffective by *Sargassum* (40%); skin irritation (10%); loss of steerage (3%); vessels stuck in seaweed (10%); tangled propellers (19%), and restricted visibility while diving (4%).

Fishers were aware that conditions have changed due to *Sargassum* influx events, and they have been dealing with the impacts as best they could, given their capacity and resources. Fishers employed various strategies ranging from simple, low cost changes to fishing techniques to more creative and advanced technological innovations, to adaptive strategies that can be employed at landing sites and out to sea (Figure 1). Due to knowledge and financial constraints, the majority of fishers interviewed have adopted smarter fishing practices by simply making behavioural changes to better manage some of the challenges faced while fishing (Figure 2). A few fishers have taken more innovative measures such as: using weather apps that provide information on wind and current patterns to gauge possible areas of fish abundance; modifying fishing gear to increase resilience while fishing; and installing handcrafted or commercially manufactured hull strainers over the boat's intake to capture *Sargassum* berries and prevent blocked water intakes.

Execution of management initiatives specifically focused on measures to be taken for or by fishers during influx events generally have been limited across participating countries, as reported by key informants. However, research into resilience building, fisheries diversification and possible economic opportunities for fishers, is underway and will be an area of greater focus in the future.

Apart from climate change stressors, marine ecosystems are facing the pressures of overfishing, coastal pollution and habitat degradation (Craig 2012). With these pre-existing threats to fisheries, and the current impacts resulting from

thousands of tons on *Sargassum* inundating coastal waters and shorelines, there is an urgent need for effective coping and adaptive measures. Although coping strategies may be useful in minimizing impacts, a more proactive and strategic long-term approach is necessary for increasing resilience, especially due to the uncertainty of the future frequency and intensity of influxes. Fishers in isolation may be unable to arrive at sustainable adaptive strategies which stresses the need for a holistic approach, providing supporting systems to build capacity, promote positive attitudinal change, explore alternative livelihoods and foster successful adaptation.

This research has highlighted the challenges faced by fishers, and recorded the valuable coping and adaptive strategies that have so far been adopted by fishers and fisheries managers. These findings will be broadly shared via a fisher-friendly 'Best Practices Handbook' being produced with support from the FAO CC4FISH project. Through this handbook, it is expected that the adaptive capacity of fishers to respond to *Sargassum* influxes will be enhanced, which could ultimately increase resilience of the entire social-ecological system.

KEYWORDS: *Sargassum*, impacts, Caribbean

LITERATURE CITED

Cox, S., B. Carby, P. McConney, H. Oxenford, J. Filho, D. Armitage, M. Marschke, and A. Granderson. 2018. *Adaptive Capacity of Fishers and Tourism Stakeholders to Address Pelagic Sargassum Influx Events in the Caribbean and North Brazil Shelf Large Marine Ecosystems.* CERMES, University of the West Indies, Cave Hill Campus. Bridgetown: Barbados.

Craig, R. 2012. Marine biodiversity, climate change, and governance of the oceans. *Diversity* **4**:224 - 238.

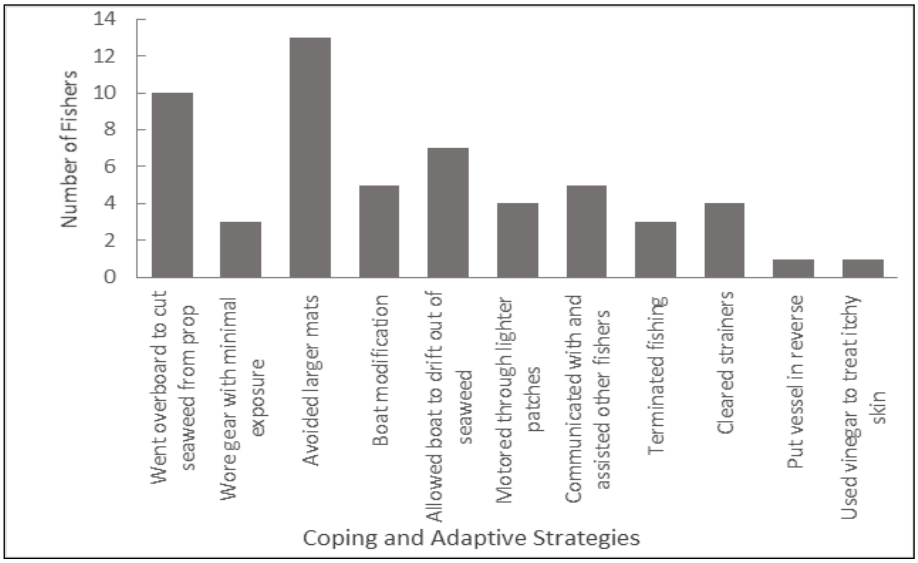

Figure 1. Number of interviewed fishers utilizing various coping and adaptive strategies.

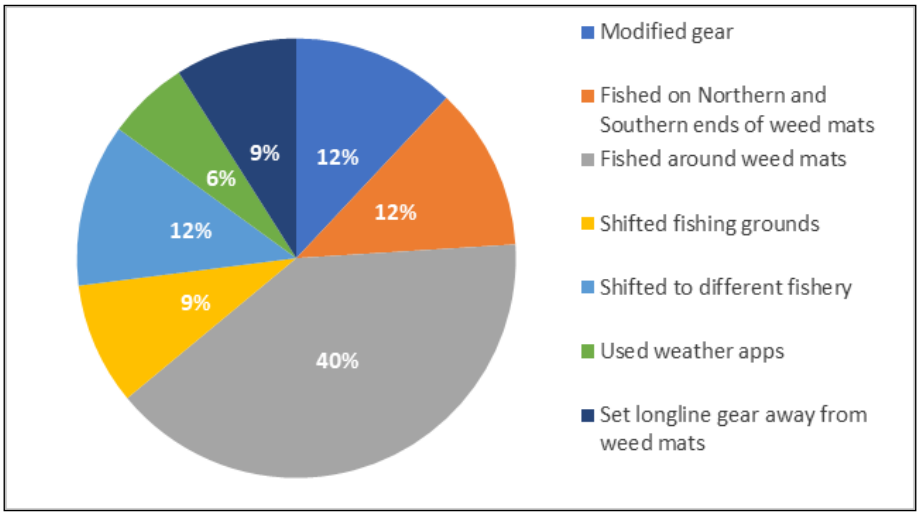

Figure 2. Percentage of interviewed fishers engaged in various smart fishing practices.