

# Socio-economic Impacts of *Sargassum* Influx Events on the Fishery Sector of Barbados

## Las Repercusiones Socioeconómicas de Eventos de Afluencia de *Sargassum* en el Sector Pesquero de Barbados

## Les Impacts Socio - économiques des Événements D'afflux Sargasses sur le Secteur de la Pêche de la Barbade

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### EXTENDED ABSTRACT

The *Sargassum* influx events occurring in Barbados, and throughout the Eastern Caribbean in the years 2011, 2014 and 2015, were new and relatively unknown to the region. Although substantial research has been done on the two pelagic *Sargassum* seaweed species in the Sargasso Sea and the Gulf of Mexico, very little was known about the behaviour of the seaweed from what appeared to be a “new source” region. Throughout the Eastern Caribbean there were multiple reports of negative impacts of *Sargassum* in countries where it washed up along the shorelines in large volumes, and calls for the development of new technologies to manage the seaweed onshore and offshore, and for an improved ability to forecast and predict landfalls of the weed. There was however, little to no research done on the socio-economic impacts of the events on the fishery sector. This research was carried out to help fill that gap for the fisheries sector of Barbados.

The main aim of this study was to investigate the socio-economic impacts of *Sargassum* on fisherfolk, by examining impacts on the livelihoods of stakeholders along the fishery value chain of Barbados, including those from the harvest sector (fishers, boat captains and boat owners) and from the post-harvest sector including individuals preparing and marketing fresh/raw product (vendors, scalers, and boners) and consumers (restaurants, processing plants, and the general public). We also examined their capacity to adapt and demonstrate resilience. The ultimate goal was to make recommendations, based on our findings, to help the sector prepare for future events. This was done firstly by identifying the impacts of *Sargassum* on the different stakeholder groups in the fishery value chain. Secondly, by collecting and analysing responses of persons in the value chain to the different impacts, and thirdly by summarising their recommendations for improvement of fishery management in light of the *Sargassum* influx events. Qualitative data collection methods were primarily employed for this study. Semi-structured interviews were carried out with persons from the different stakeholder groups in the fishery value chain. Key informant interviews were conducted with persons belonging to different government and non-government agencies, having roles in managing the *Sargassum* influxes. Focus group meetings were held separately with fishers from the west, east and south coasts of Barbados, and scenario-based planning exercises were conducted in each of these focus groups, to examine fisherfolk ‘coping mechanisms’ to the impacts of the influx events.

Most fishers suffered boat engine and gear problems during *Sargassum* influx events as a result of the weed clogging cooling water intakes, entangling in propellers and rudders causing engines to stall and boats to lose steerage, or catching on hooks and in nets often damaging the gear or at least rendering it ineffective at catching target species. The weed also prevented access to jetties, slipways and moored vessels in some locations. These problems resulted in unpleasant and higher risk working conditions, higher operational costs, and lost fishing opportunity. The two main fishery species in Barbados, flyingfish and dolphinfish (Fisheries Division 2004), appeared to be the most effected by the *Sargassum* influxes. Flyingfish catches declined significantly during *Sargassum* events, and dolphinfish appeared earlier in the fishing season, but as very small juveniles. As such, the presence of the seaweed had a large impact on the harvest sector, affecting many fishers, boat captains, and boat owners, especially those in the offshore pelagic fishery, through significant declines in overall catches and revenue.

The decreased availability of flyingfish and the small size of dolphinfish also had repercussions throughout the fish value chain. For example, the reduced availability of fish led to an increase in fish prices down the fishery value chain, with customers having to bear most of the large increase in market prices. Vendors, scalers and boners, especially those employed in processing flyingfish, were the most negatively impacted in the post-harvest sector, because of the decrease in fish available to be bought, and the higher prices at which they were sold. The results demonstrated that the ecological changes brought about by the presence of the *Sargassum*, had socio-economic repercussions for those involved in the fishery sector, and by extension the public. Differences in the type and severity of impacts were seen among the different stakeholder groups and among different landing sites, with the windward east coast, and semi-windward south coast sites being more severely affected than the west coast, largely because of mass strandings and decomposition of the weed along these shorelines. Fisherfolk in the fishery value chain dealt with impacts in a short-term, day-to-day manner, instead of seeking more long-term solutions. For example, in response to the presence of the seaweed, fishers opted to change their fishing effort, some increasing the number of days or hours spent fishing, whilst others decreased their effort to save the increased boat expenses. Fishers increased the ex-vessel price of fish, and as a result vendors also increased their prices, with the effect that customers bought less fish. The study also highlighted the lack of fisheries management policy to deal with

*Sargassum* influxes, or other environmental events of similar magnitude.

A few recommendations are offered to increase preparedness for similar events in the future. These include:

- i) Increased fisherfolk education and outreach to ensure that they have accurate information and can learn from adaptive measures taken by other countries impacted by the *Sargassum* influx events,
- ii) Involvement of fisherfolk in the development of a national *Sargassum* response plan to be used as a guide by the different agencies involved in the management of future *Sargassum* influx events,
- iii) Support of research to develop a reliable early warning system, and
- iv) Creation of incentives and opportunities to explore *Sargassum* as a potential alternative income for those within and outside of the fishery value chain.

**KEYWORDS:** *Sargassum*, Barbados, fishery, impacts, socio-economic

#### **LITERATURE CITED**

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