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THE IMPACTS OF COVID-19 LOCKDOWNS ON COASTAL FISHERIES IN SRI LANKA

APRIL 2021

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Acknowledgments

We wish to thank the Marine Conservation Action Fund at the New England Aquarium for funding this project. We acknowledge the respondents for their participation, cooperation, and contribution to this research. Furthermore, we wish to extend our gratitude to Mrs. Jegatheeswary Ehamparam Gunasingham for coordinating our research assistants in the North and East coasts and assisting with the quality checking process of the surveys. In addition, we acknowledge the work of our research assistants who conducted the interviews: Kaushalya Balasooriya, Dilini Gamage, Manuja Hendawitharana, Iflal Ilyas, Thamiliny Kaneshalingam, Mohammed Mujas, Kajanthini Rajanalendran, Shalanka Ranjula, Rifdha Riswan, Antony Santhosh, Saranya Sinnathurai, Sathiavakeesparan Sivanthan, Abilagini Vickraman and Muththulingam Yuhinthan. We acknowledge the support received by Isha and Naduni Mallika Arachchi when writing this report. We also acknowledge Dr. Nelly Kadagi for her guidance during the data analysis phase of the project.

Marine Conservation Action Fund at

New England Aquarium

Protecting the blue planet

Cover photo: Asha de Vos

This document should be cited as: Azmy, N., Giritharan, A., Jamel, H., Mangubhai, S., & de Vos, A. (2021). The impacts of COVID-19 lockdowns on coastal fisheries in Sri Lanka. Oceanswell, Colombo.

Printed by Intermart Printers (Pvt) Ltd.

ISBN 978-624-5751-00-6

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Executive summary

Small-scale fisheries remain a cornerstone of economic activity in Sri Lanka generating income and providing subsistence. The surge in COVID-19 cases around the world led to the Sri Lankan government imposing an island-wide curfew on 20 March 2020, followed by lockdowns and travel restrictions of varying nature. Through structured interviews across 13 study sites around the Sri Lankan coastline, we explored different dimensions of the impact of COVID-19 on small-scale fisheries between 29 July to 29 August 2020. We particularly focused on 1) the impacts on livelihood; 2) support provided by different entities; and 3) the adaptive capacity of small-scale fisheries actors, namely fishers, processors and sellers/traders. The main impacts of COVID-19 on fisheries in Sri Lanka, prior and during this study were due to the island-wide curfew, cross border mobility restrictions and trade regulations. The inaccessibility to the ocean, and thereby fishing, negatively impacted the entire fisheries community due to limited coping strategies and lack of alternative income. Conversely, fewer processors reported an adverse impact which could be due to the longer shelf-life of their product, dry fish, which renders more control over their stocks during similar market shocks. We reflect on the implications of unprecedented events on small-scale fisheries and the paradigm shift necessary to predict, plan and prepare for such market shocks. The consequences of overfishing, climate change and climate change-induced factors such as storm surges, sea level rise and coastal flooding are examples of potential future shocks that could threaten seafood stocks. These compounding effects, along with pre-existing vulnerabilities related to structural, social and economic inequality, in turn exacerbates the effect of COVID-19 and similar shocks on well-being in fisheries communities.

Antony interviews a coastal fisher in Pallikuda, Poonakary located off the northern coast of Sri Lanka.
Photo: Anthony Santhosh/ Oceanswell

Introduction

The World Health Organization (WHO) announced the emergence and rapid spread of the novel coronavirus SARS-CoV-2, as a public health emergency of international concern on 30 January 2020, and declared it a pandemic on 11 March 2020 (World Health Organization, 2020). As of 31 December 2020, there were over 82,398,927 cases globally, 42,702 of which were reported in Sri Lanka (World Health Organization, 2020). The first case of coronavirus in Sri Lanka was reported on 27 January 2020 (World Health Organization, 2020). With a surge in COVID-19 cases across the globe, the Sri Lankan government imposed an island-wide police curfew on 20 March 2020 (Foreign Ministry - Sri Lanka, 2020), followed by a number of different lockdowns and travel restrictions (Figure 1). All curfews and restrictions were lifted on 28 June 2020, and all economic activities were set to resume (President of Sri Lanka, 2020). However, a second wave resulted in various lockdowns and inter-city travel restrictions being imposed from the 4 October 2020, amidst a surge in the number of COVID-19 cases (Sunday Observer, 2020).

The marine fisheries sector in Sri Lanka provides direct and indirect employment for approximately 583,000 individuals and has a supporting workforce comprising 2.7 million from coastal communities, accounting for 1.2% of the 2018 GDP (NARA, 2019). Furthermore, the marine sector accounts for 83% of total fish production in Sri Lanka (NARA, 2019), and provides more than 60% of the animal protein requirement to the people of Sri Lanka. The fisheries industry is divided into three subsectors: inland fisheries, coastal fisheries, and offshore/deep-sea fisheries. Coastal fisheries involve individuals whose fisheries activities are limited to the continental shelf (average 22 km from the shore, rarely exceeding 40 km), while offshore/deep-sea fisheries go beyond the coastal waters up to the EEZ (Exclusive Economic Zone, up to 200 nm) boundary (Department of Fisheries and Aquatic Resources, n.d). This report will focus on these two subsectors.

Supporting roles are crucial to the fisheries supply chain: processors prepare raw fish by washing, gutting, salting, fermenting, drying, and smoking, in order to produce a final or intermediate fishery product, or a by-product such as fishmeal; and sellers take part in the wholesale and retail sale of seafood.

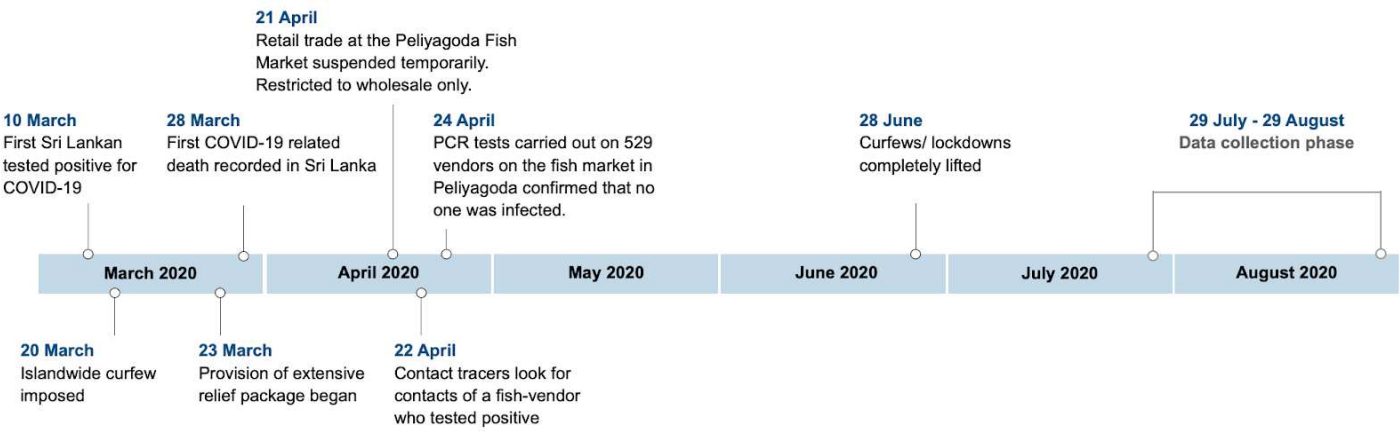

Figure 1: Timeline of major events related to the spread of COVID-19 in Sri Lanka from March to August 2020 - when this study was conducted.

The social and economic contributions of the coastal fisheries sector are complex and comprise multiple actors and market influencers (Hirimuthugodage, 2017). The sector uses smaller vessels and engines, simpler or more traditional gear, occurs near the coast, consists of smaller crews with family or local ownership and is important for locals and livelihood subsistence (Kittinger, 2013; Smith & Basurto, 2019).

While men in fishing communities are typically involved in fisheries for income generation, women oversee subsistence fishing, post-harvest preparation and processing (Feka et al., 2011). Women are involved in fisheries throughout the coastal regions of Sri Lanka, participating in activities that range from gleaning in lagoons, shallow waters, mangroves, and inland fisheries (Lokuge & Hilhorst, 2017). The lack of official recognition of women's contribution by the state has limited the active involvement of women in the fisheries sector (Lokuge & Hilhorst, 2017).

The COVID-19 pandemic led to negative consumption and production consequences to the economy due to the need to practice social distancing and minimise in-person interactions to curb the spread of the disease (World Health Organization, 2020). The main known impacts of COVID-19 on fisheries in Sri Lanka, prior and during this study were due to the island-wide curfew, cross border mobility restrictions and trade regulations (Figure 1). This report explores the ways in which the curfew in Sri Lanka impacted coastal fishing communities just prior to the survey period (29 July 2020 - 29 August 2020).

Methods

Experimental procedure

This socioeconomic study was carried out using pre-tested questionnaires targeted at three groups of fisheries actors in the fisheries value chain: fishers, processors, and sellers/traders (Figure 2). The survey was designed to collect information on the livelihood impacts, support provided by entities, and adaptation abilities of fisheries actors across Sri Lanka. A purposive sampling approach was used and the number of surveys to be conducted in the respective coasts were predetermined. The surveys were conducted between 29 July to 29 August 2020 (Figure 1).

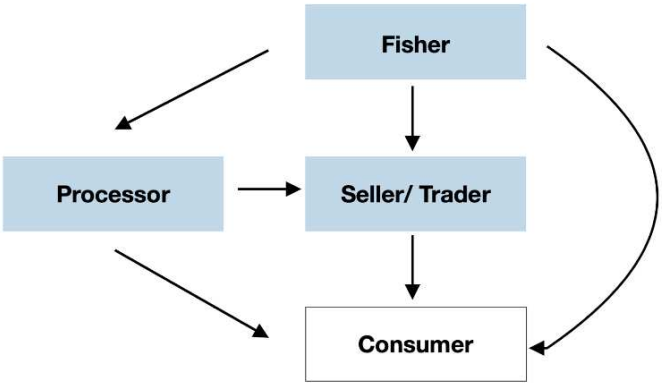

Figure 2: The relationship between the different fisheries actors and the consumer. The three fisheries actors interviewed in this study are represented in blue: fishers, processors, and sellers/traders.

Data collection

One-on-one interviews, approximately 20 minutes in length were conducted in the native language of the respondents (Sinhalese or Tamil) and all responses were translated into English for data analysis. The surveys were anonymised to protect the respondents' identity. Interviews were carried out by 14 trained interviewers. The interviewers visited the field in pairs and followed COVID-19 safety protocols (Official Website for Sri Lanka's Response to Covid-19, 2020; World Health Organization, 2020). Their existing relationships with the fisheries actors helped eliminate strategic bias due to social barriers. In a sector dominated by males, female fisheries actors are often considered a 'hard to reach' population. Therefore, the snowball sampling technique was used to identify female fisheries actors by requesting respondents to provide contact details of female fisheries actors.

Data analysis

The responses were transcribed electronically, and quantitative data were analysed using Microsoft Excel and R using descriptive statistics. The qualitative data were extracted using text analysis, categorised further and themes were developed. The information collected through the surveys delve into the following themes: 1) the distribution of work in fisheries and the impacts on livelihoods 2) support networks and access to benefits, and 3) adaptation strategies.

Results

Coastal distribution

The sample included data from 13 study sites around the coastline of Sri Lanka (Figure 3) comprising 415 structured surveys. A complete breakdown of the number of surveys conducted per coast can be found in Annexure 1. The main survey sites in the north included Mannar, Mulativu, Kilinochchi and Jaffna, and the surveys in the east were conducted in Trincomalee, Valachchenai, Batticaloa and Ampara. On the south coast, surveys were conducted in Tangalle and Galle, while on the west coast surveys were conducted in Beruwala, Negombo and Kalpitiya (Figure 3).

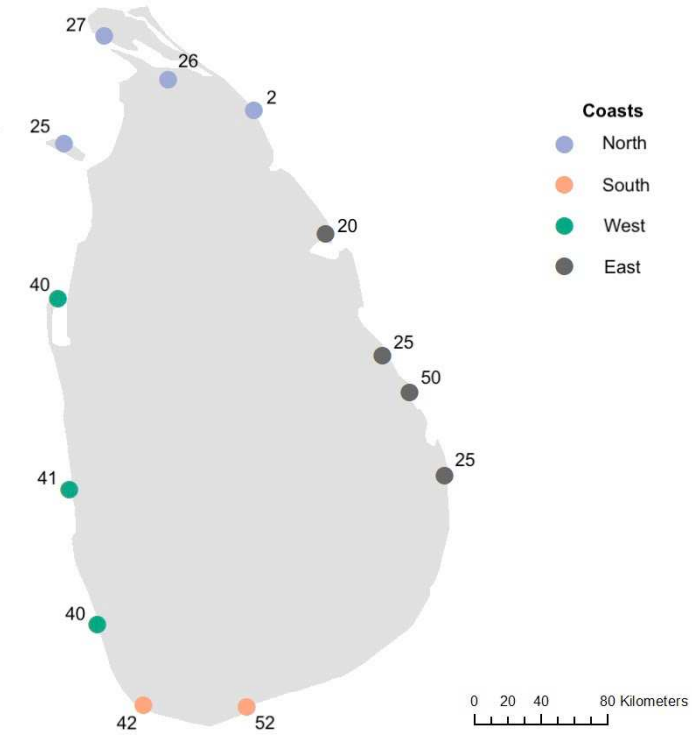

Figure 3: The number of surveys conducted in the thirteen study sites around the coast of Sri Lanka: Mannar, Mullaitivu, Kilinochchi, Jaffna, Trincomalee, Valaichchenai, Batticaloa, Ampara, Tangalle, Galle, Beruwala, Negombo and Kalpitiya

Demographic

Out of the 415 respondents, 50% were fishers (36% coastal fishers and 14% offshore/deep-sea fishers), 25% were processors and 25% were sellers/traders (Figure 4). Overall, 25% of respondents were women; 47% processors, 28% sellers/traders and 26% fishers (Figure 5).

The numbers of each type of fisheries actor categorised by coast can be found in Annexure 2. The average age of respondents was 44 years, ranging from 17 to 73 years. Among the respondents, 84% (n=348) reported that they were solely dependent on fisheries for their income.

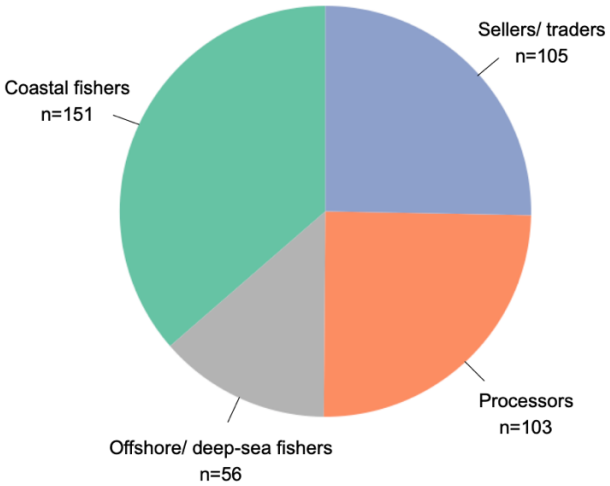

Figure 4: The total number of respondents categorised by fisheries actor

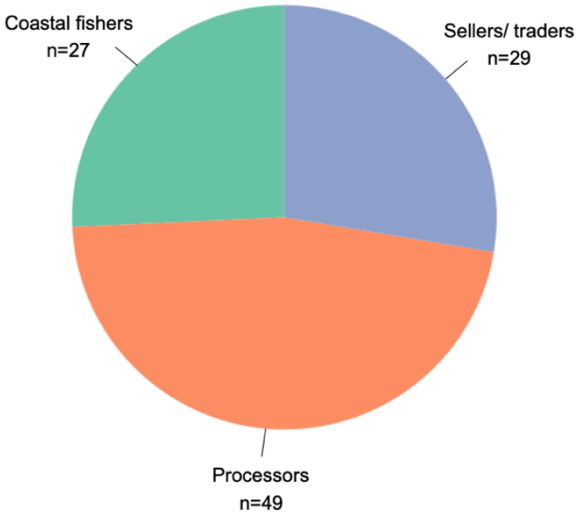

Figure 5: The total number of female respondents categorised by fisheries actor

Livelihoods

Out of those surveyed, 91% (n=95) of sellers/traders and 90% (n=186) of fishers reported that COVID-19 and the resulting restrictions had an impact on their work. Comparatively, 66% (n=66) of processors surveyed reported that their work was impacted. However, among the processors interviewed in the North, 81% (n=17) reported an adverse impact on their work in contrast to only 59-65% of the processors on the other coasts (Figure 6).

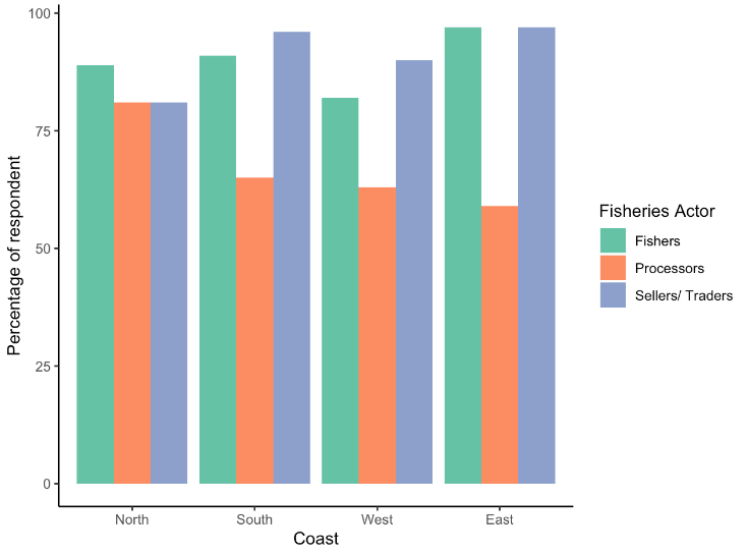

Figure 6: Distribution of respondents who reported that COVID-19 impacted their work categorised by coast and fisheries actor

Table 1: The three common themes that impacted the respondents' work

Limited accessibility The respondents had to limit their agency/ability with regards to their fisheries related activities due to the restrictions imposed by the government.	**Limited resources** The respondents were unable to buy/access the raw materials they needed for their respective fisheries related activity.	**Impact on income** The market forces that had a direct effect on respondents' income.
Restricted/no access to fisheries related activity. Restricted/no access to customers and market. Limited access to other fisheries actors' services.	Processors and sellers reported a lack in seafood supply. Fishers reported difficulties in accessing resources such as ice and fuel due to unaffordability and/or price fluctuations.	Restrictions/fall in exports. Change in consumer demand due to movement restrictions.

The responses relating to how fisheries related activities were impacted by COVID-19, were divided into three general categories for analysis: limited accessibility, limited resources, and impact on income (Table 1). Most respondents attributed their work being interrupted, to limited access to fisheries due to the curfew.

The impacts highlighted in Table 1 were common among all fisheries actors. However, within each group there were some factors that were more influential than others. Fishers reported that restrictions in going to sea impacted their work the most ("There were very strict restrictions, so we couldn't reach our vessels and there was no way for us to buy fuel" - Male, Kalpitiya). The main concern for processors was the unavailability of raw materials ("Due to the COVID-19 pandemic, fishing activities were affected for a consecutive number of weeks which resulted in unavailability of fish for us to process" - Female, Jaffna), while the sellers attributed the inaccessibility of consumers to be what impacted them the most ("There were fewer buyers due to the pandemic and as a result my income decreased" - Male, Tangalle).

In addition, fishers reported that the absence of other fisheries actors such as processors and sellers/traders, and labourers to land their boats had an impact on their work ("Due to the absence of processors, my harvest was spoilt and there were no sellers or consumers to sell the catch" - Male, Jaffna). While some fishers received curfew passes, the limited access to ice malls and fuel impacted their fishing activity ("Though the government provided curfew passes for boats during the curfew period, ice malls were closed. Therefore, the harvest couldn't be preserved. In addition the reduction of consumer demand at the time also resulted in the spoilage of the catch"- Male, Galle). The fishers who received curfew passes reported difficulties in accessing the pass, delays in receiving the pass and limitations on fishing hours ("Could not get a curfew pass for fishing due to the long distance to the harbour from my home" - Male, Galle; "We weren't able to do fishing activities for one month. After a month, we went fishing with a curfew pass." - Male, Beruwala; "Fishing activities were limited to one to two days per week and the time spent fishing was shortened as well" - Male, Galle). Similarly, processors mentioned that the absence of fishers and sellers impacted their work. However, the ability to store processed seafood meant that they had

stocks of seafood that they were able to sell ("Unlike fresh fish, dry fish can be stored. Therefore, I had previous stocks that were available to be sold" - Female, Negombo).

Conversely, sellers reported that limitations in storing the fresh seafood meant that it had to be sold immediately which resulted in the reduction in the price of the seafood ("I wasn't able to store the fish. Since I had to sell it immediately, I had to lower the prices." - Male, Batticaloa).

A clear trend was not observed in the change in price of seafood; however, many offshore/deep-sea fishers (68%, n=38) reported a decline in the price of seafood (Figure 7). The respondents highlighted four factors that resulted in the reduction in seafood price, three of which were common among all fisheries actors; lack of sellers/traders ("Traders are not coming out to buy fish from us during curfew" - Male, Trincomalee), decrease in consumer demand ("Harvest had to be sold for a low price due to lack of consumer demand" - Male, Mannar), and decrease in export ("All companies were closed, so export decreased and the traders in our area reduced the price" - Female, Mannar). However, offshore/deep-sea fishers reported that the inability of consumers to afford their catch was a reason for the decline in the price of seafood ("The price is not affordable for people or buyers, so we have to reduce the price" - Male, Tangalle).

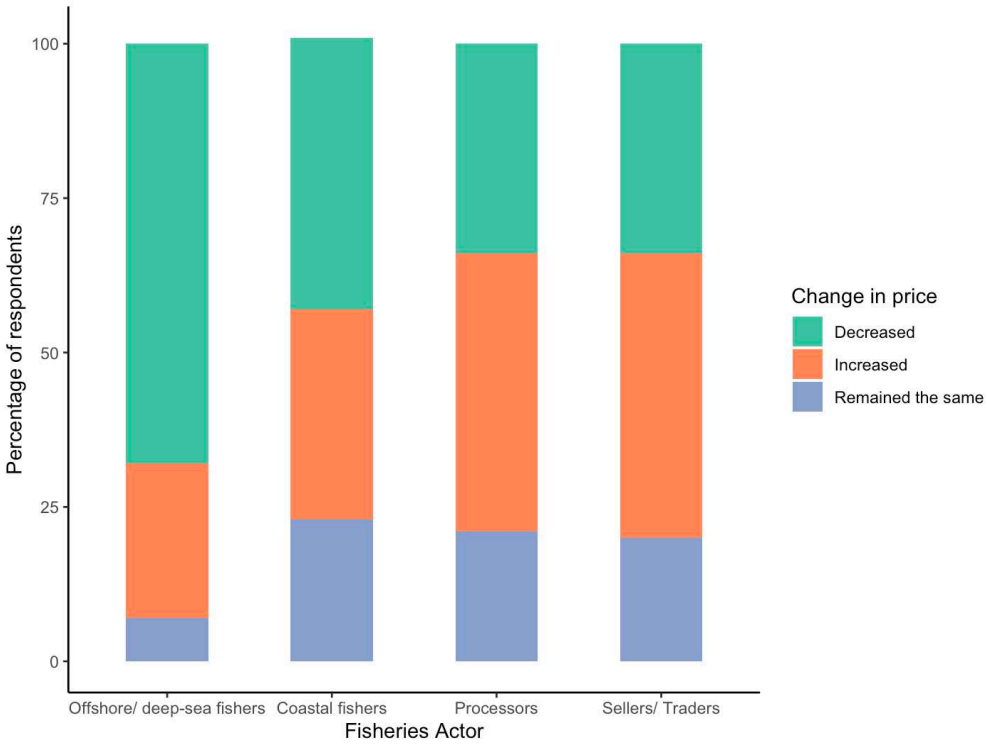

Figure 7: Changes in seafood price reported by the fisheries actors

Support and adaptation

Among the respondents 74% (n=308) received some form of assistance. A majority received assistance from the government, while some received support from religious institutions and their communities. Overall, 63% (n=263) reported that they received a government issued allowance between Rs.5,000 - Rs.10,000, and 75% (n=197) reported that the assistance was successful. The percentage of respondents that received government support was lower in the North (49% (n= 39) and East 57% (n=68) coasts (Figure 8).

The adaptation strategies commonly used by all fisheries actors were divided into 4 categories for analysis: utilised savings and credit services, relied on assistance from the community, switched mode of income and relied on excess seafood for subsistence (Table 2).

Most respondents reported that they wouldn't be able to cope in the event of another lockdown as they had exhausted their limited savings. The shortage of food ("Food shortages will lead to starvation" - Female, Jaffna) and severe impacts to income would impact their families ("I can't even imagine another lockdown because my whole family faced many difficulties. Since we survive on a daily wage, when a lockdown is imposed, we can't earn money" - Female, Tangalle).

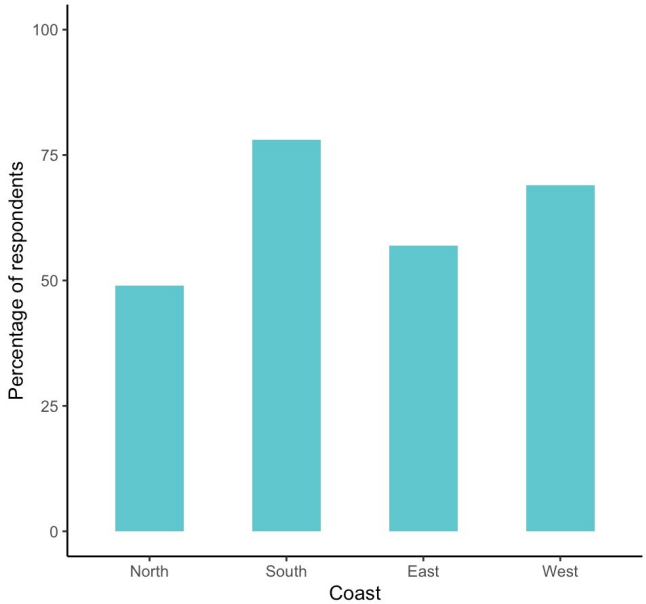

Figure 8: The proportion of respondents who received assistance from the government categorised by coast

Table 2: The four most common adaptation mechanism

Utilised savings and credit services	Relied on assistance from the community	Switched mode of income	Relied on excess seafood for subsistence
Used savings Pawned jewellery Accessed bank loans	Assisted by family/ community (e.g. relatives, friends, neighbours)	Switched their mode of income to an activity beyond their existing skill set (e.g. preparing gill nets, going for deep-sea fishing without experience, farming)	Consumed the excess fresh seafood Processed excess seafood for consumption (e.g. making dry fish for preservation)

Assistance

The additional support that was requested by all fisheries actors were categorised into three themes: financial assistance, essential goods, and reduction in utility bills (Table 3). These types of assistance were expected from the government.

In addition, fishers emphasised the need to reduce the price of fuel, nets, and other equipment, and requested for their equipment to be subsidised ("To reduce the cost of fishing gear and oil price" - Male, Negombo, "I would expect money and nets as the two nets provided by the government are insufficient" - Male, Trincomalee). Processors requested a reduction in imported fish and dry fish ("It would be helpful if there were reduced imports of both fish and dry fish" – Male, Jaffna), while sellers/traders requested better storage facilities ("Buying a refrigerator would allow us to preserve fish stocks for longer" - Male, Negombo). Furthermore, both processors and sellers/traders requested for the price of seafood to be stabilised ("It would be helpful if there were fixed rates for local dry fish" - Male, Jaffna).

Table 3: Assistance requested by the respondents

Additional support requested by all fisheries actors
Financial support, as finances are becoming scarce
Low/ No interest loans
Customised loan schemes for fisheries actors
Provision of food rather than financial aid
Reduction in electricity and water bills

Mujas interviews a processor as she separates the shells of clams in Mutur, located in the eastern coast of Sri Lanka.
Photo: Mohammad Mujas/ Oceanswell

Discussion

The focus of the study was to identify the impacts of COVID-19 lockdowns, on small-scale fisheries actors. Offshore/deep-sea fishers were included in the study to compare their adaptive capacity to small-scale fisheries, due to the larger scale of their fishing activity. Processors and sellers/traders were included in the study to understand the impacts on actors who directly interact with fishers, and thereby comprise the broader fisheries community. The interviewers were unable to reach the target number of women respondents (30%) which reflects the low numbers of women in Sri Lankan fisheries. The lack of official recognition of the roles that women play (Lokuge & Hilhorst 2017) and the fact that a substantial amount of women's labour is unpaid (Sandaruwan et al., 2016) likely contributed to the womenfolk being a 'hard to reach' population. The majority of female fisherfolk interviewed were processors (Figure 5), which could be attributed to the fact that women are predominantly involved in post-harvest preparation and processing (Feka et al., 2011).

Despite the release of a government Gazette notification which stated that transporting and unloading of fish and engaging in fishing activities during curfew hours was permitted (Presidential Secretariat, 2020), all three fisheries actors reported restrictions when carrying out their respective fisheries-related activities. As a result, the restrictions on fishers going out to sea due to curfew was a barrier that had resulting knock-on effects through the entire fisheries value chain. Similar trends were observed in studies conducted in Bangladesh and Malaysia where a disruption in the seafood supply chain impacted the entire fishing communities (Jomitol et al., 2020; Sunny et al., 2020). Furthermore, a decrease in income was reported by 84% of the respondents, similar to that observed in Malaysia where despite the government allowing fisheries activities, a severe decrease in income was reported (Jomitol et al., 2020). This decrease can be attributed to the inaccessibility to fisheries activities, along with a decrease in consumer demand and spending power, and steep declines in export (Sri Lanka Export Development Board, 2020).

There was no overall trend in the change in seafood price among coastal fishers, processors, and sellers/traders (Figure 7). This contrasts with a study conducted in Indonesia, which reported that the change in seafood price depended on factors such as daily catch per trip and the type of seafood caught (Campbell et al., 2020). As our study did not collect data per trip or per kilogram of the varying species that were caught, the reason for the price variation cannot be confirmed. A more comprehensive market-based study would help understand the reported fluctuation in seafood price.

A higher proportion of offshore/deep-sea fishers reported a decrease in the price of seafood (Figure 7). This could be because they catch high value seafood. The offshore/deep-sea fishers mainly target large and medium tunas, with skipjack (*Katsuwonus pelamis*) and yellowfin (*Thunnus albacares*) dominating the catch (Edirisinghe et al., 2018), both of which are high-value fish (NARA, 2018). In Sri Lanka, the price of seafood is governed by market supply and demand, consumer perception and purchasing power (NARA, 2018). The reduction in the purchasing power of the consumer that was observed by offshore/deep-sea fishers, the reduction in export demand, and trade restrictions could explain the observed trend. Furthermore, both species of tuna are important exports of Sri Lanka and a significant decrease in the export performance of edible fish was observed during this period (Sri Lanka Export Development Board, 2020). This is likely due to the vast reduction in export-oriented demand due to port

closures, loss of access to cold storage and cessation of shipping and air freight (Orlowski, 2020). A similar reduction in demand for high-value seafood was also observed in Bangladesh and Malaysia (Jomitol et al., 2020 and Sunny et al., 2020).

The number of processors who reported that COVID-19 and the resulting lockdowns impacted their work was less compared to the other actors (Figure 6). The longer shelf life of dried seafood compared to fresh seafood would explain this observation. The longer shelf life allows processors involved in dry seafood processing more control over their stocks during market shocks. A similar trend was observed in Indonesia (Campbell et al., 2020). Conversely, fishers and sellers/traders who deal with fresh seafood have time sensitive requirements for immediate processing and selling mechanisms, without which they face losses or spoilage of their stocks. While a similar trend was observed among the processors throughout the coast, there were more processors in the North who reported that the restrictions impacted their processing activity (81%). The reason for this is unclear.

Among the respondents, 63% reported receiving a government issued allowance during this period. However, fewer fishers from the north and east coasts reported receiving this allowance (Figure 8). While a few respondents mentioned that they relied on the government allowance, this was not the case for most. The most common coping strategy observed among the respondents was relying on their personal savings. A considerable number of respondents had savings, in comparison to reports from Indonesia where a very low percentage of fisheries actors could rely on their savings as a coping mechanism (Campbell et al., 2020). The next most common coping strategy was using credit services such as loans and pawning jewellery. Accessibility to these services from banks and financial institutions appears to be better in Sri Lanka in comparison to Bangladesh, where the communities were unable to access these services as they did not have sufficient resources to mortgage (Sunny et al., 2020). This said, a small number of respondents reported that they were not able to access financial services and requested customised loan schemes for the fishing communities. Most respondents requested financial assistance and better suited financial services such as low interest loans. There were also greater requests for food essentials in place of financial aid. This could be due to the difficulties in accessing essential goods resulting from imposed movement restrictions. Additionally, there were requests for reductions in electricity bills and water bills. The government provided a relief scheme which allowed consumers to pay the electricity bills for March, April and May based on the rate applied in the bill issued for February or the minimum bill received afterwards (Range, 2020). While the assistance requested by the three fisheries actors were similar, there were a few requests that were unique to their role in the value chain. The requests from fishers were mainly centered around their ability to go to sea and access to the necessary commodities to carry out their essential operations. Accessibility and affordability were concerns. Processors requested a reduction in the quantity of imported processed seafood, which could be because the average wholesale price of local dried fish was higher than that of imported dried fish (NARA, 2018). With the spending power of consumers reducing due to the negative economic consequences of the pandemic, consumers are more likely to opt for cheaper alternatives, negatively impacting demand for the local product.

Even though the respondents had access to coping strategies, it is important to note that during this period the government had not reported community spread. The number of cases were contained, and necessary

measures were in place to decrease the impact of the pandemic in the community. Therefore, the report is a representation of the impacts mainly due to the lockdown. In a future event their coping capacities would be limited. We suspect that it would be harder for the fisheries communities as they would have already exhausted the limited resources that were available to them during the initial lockdown. Thus, further research into how the pandemic is impacting these communities during the second wave is imperative to understand the impact of the pandemic fully. Despite having reported access to coping strategies during this lockdown, respondents did not feel they would have the same coping capacity in the event of a future lockdown with their main concern being a shortage of food.

Overall, the study shows that the inaccessibility to the ocean and thereby fishing negatively impacted the entire fisheries community due to limited coping strategies and lack of alternative modes of income. Therefore, the results of this study can be used as a model to predict and prepare for other unforeseen shocks that can limit access to seafood stock. The consequences of overfishing, climate change and climate change-induced factors such as storm surges, sea level rise and coastal flooding are examples of potential future shocks that can threaten seafood stocks and access to them.

Edirisinghe et al. (2018) reported that the coastal fisheries in Sri Lanka have reached optimum exploitation levels. Fishing efforts have increased with the catch remaining the same (NARA, 2018). The deficit being filled by the gradual transition to deep-sea fishing. Therefore, the contribution of offshore/deep-sea fishing to fish production is steadily increasing while coastal fisheries are showing a steady decline (Arulananthan, 2017). To adapt to this situation the sector has resorted to investing in new fishing gear. However, the cost of the gear is beyond the capital resources of many small-scale fishers. Similarly, climate change is causing the marine ecosystem to change at an unprecedented rate with inevitable adverse consequences on the Sri Lankan marine ecosystem (Barange et al., 2018). Since the sustainability and productivity of fisheries is heavily dependent on conducive environmental conditions, climate change-induced factors will affect the production, availability and breeding patterns of marine species. The redistribution of fisheries resources will render traditional fishing grounds unproductive and fishing gear and methods ineffective. In response, larger vessels, longer trips and new gear development will be crucial. These adaptation strategies will be more challenging for the increasingly vulnerable small-scale fishers (Arulananthan, 2017). In addition, climate change-induced storm surges, sea-level rise and coastal flooding will impact fisheries as well as the coastal communities. Arulananthan (2017) reports that all coasts apart from the northernmost coast of Sri Lanka are experiencing a moderate to high degree of erosion. The close proximity of small-scale fisheries communities to the coast further increases their vulnerability to these events. These compounding effects, along with the pre-existing vulnerabilities, related to structural, social and economic inequality, in turn exacerbate the health, economic and other impacts of COVID-19 and similar shocks (Bennett et al., 2020).

The involvement of around 120,000 fishers in mostly small-scale fishing in the coastal waters forced the Sri Lankan government to include small-scale fisheries as a priority group for poverty relief (Dissanayake, 2009). Adaptation and preparedness at all stages of the value chain, including the resilience of vulnerable coastal communities and their livelihoods to threats is crucial in this endeavour.

Recommendations

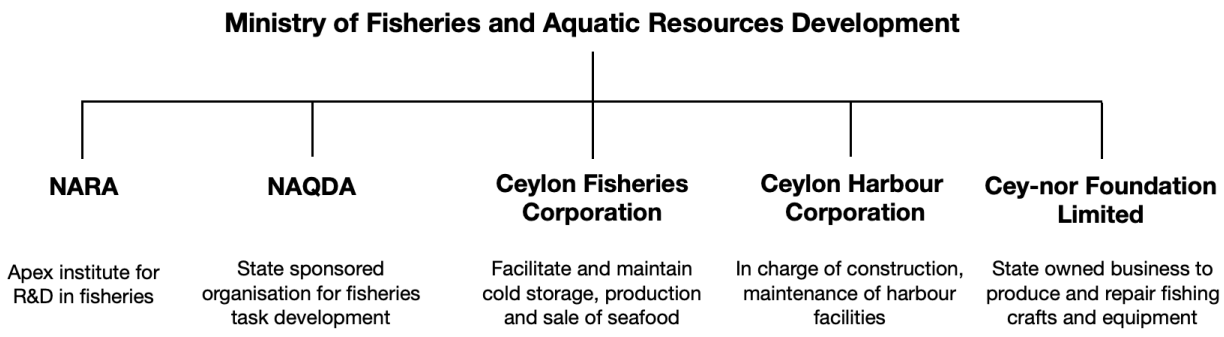

Figure 9: The existing Sri Lankan governance framework

Small-scale fisheries are prone to instability during crises such as COVID-19 as their livelihoods cannot withstand market shocks. They are dependent on existing systems which have proven unstable in the face of the pandemic. Disaster risk reduction and preparedness is crucial to the survival of small-scale fisheries communities and is covered in the National Fisheries and Aquaculture Policy section 4.5. The section addresses the government's responsibility to the environment, climate and natural disasters by the development of strategies for risk reduction and preparedness; providing assistance to families; developing community resilience; and improving institutional involvement and research to maintain updated databases (Ministry of Fisheries and Aquatic Resources Development, 2018). The national policy under section 4.5 further highlights the government's responsibility to generate employment opportunities as well as equal opportunities for female participation in the industry. Socioeconomic conditions can be improved by providing subsidies and financial facilities and strengthening human rights and anti-corruption measures.Additionally, section 4.5 also addresses the importance of promoting public private partnerships for investment in the sector and strengthening fisheries cooperatives (Ministry of Fisheries and Aquatic Resources Development, 2018). The governance structure for fisheries management, under the purview of the Ministry of Fisheries and Aquatic Resources Development, could serve as a model to further develop a policy response that will protect communities from compounding impacts and market shocks in the event of disasters (Figure 9).

Building resilience through collective action will require cooperation and coordination. Communities need to be made aware of legal systems and ways to approach relevant organisations. Government agencies and civil society organisations have important roles to play in this regard. Support could be provided to community-based fisheries management organisations to enable their direct involvement in assessing vulnerability, and measures to secure climate resilience including those addressed in the National Determined Contribution (NDC) (Ministry of Mahaweli Development and Environment, 2016).

Stakeholder engagement is instrumental in successful risk preparedness and management. The Department of Fisheries being the apex body in charge of disaster response has responsibility in appointing an oversight committee to mobilise state institutions,

allocate budgets and send out calls to actions to NGOs, donor organisations, private sector partners and development agencies to support small-scale fisheries to tackle urgent and time-sensitive disasters.

The private sector can innovate during a time of crisis through its technological capacities. Since COVID-19, corporations in the island moved away from their traditional 'brick and mortar' system to online delivery methods in order to keep up with consumer demand. In small-scale fisheries, due to the lack of technology and online presence, their connectivity to the consumer was limited during lockdowns. By strengthening collaborative partnerships, the government can strengthen supply chains extending beyond small-scale fisheries.

Access to low and no interest microfinance schemes for fishers are limited. More so for female fishers due to the lack of gender-disaggregated data and limited registrations of women who participate in small-scale fisheries (Lokuge and Hilhorst, 2017).

Community engagement through skills building and training programmes will contribute to small-scale fisheries' competitive capacities in fisheries industries.

Provision of schemes for fishers to access modern and sustainable technologies including mechanised and non mechanised boats, along with technical knowledge that can be disseminated through Ocean University courses for young generations is essential for capacity building for a viable future for coastal communities.

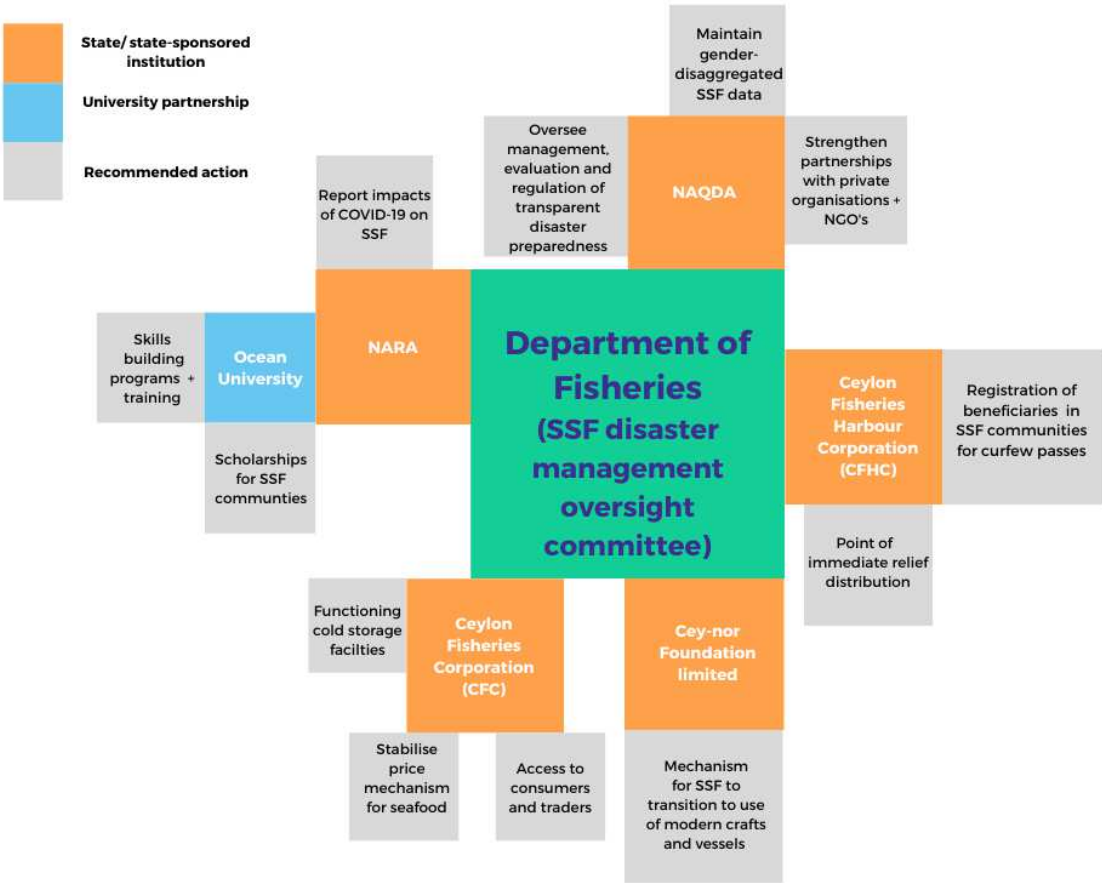

Figure 10: Disaster risk preparedness inter-institutional recommendations based on the study

Respondents had issues accessing food sources during the pandemic. Food security during the curfews implemented was limited to relief packs. Ensuring that food vendors remain open and accessible to households can relieve coastal communities of the additional stress of meeting daily food intake requirements. Encouraging home and community gardens would further ensure food security and self sufficiency in the long term.

Similar to the below model (Figure 10), **climate change adaptation strategies must be developed and implemented in cooperation with affected communities and their organisations through transparent processes.** To ensure transparency, states should develop relevant indicators, maintaining gender-disaggregated data to track the impacts of climate change on poor and vulnerable groups and geographical areas.

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Annexure 1

Table 4: A breakdown of survey areas in the respective coasts and the number of surveys conducted

Coast	Survey sites	Number of surveys
South	Galle	42
	Tangalle	52
West	Beruwala	40
	Kalpitiya	40
	Negombo	41
East	Ampara	25
	Batticaloa	50
	Trincomalee	20
	Valaichchenai	25
North	Jaffna	27
	Kilinochchi	25
	Mannar	2
	Mullaitivu	26

Annexure 2

Table 5: A complete breakdown of the 415 surveys categorised by fisheries actor, coast and gender of respondents.

Coast	Total	Fishers			Coastal			Multi-Day			Processors			Sellers/Traders		
		F	M	Total	F	M	Total	F	M	Total	F	M	Total	F	M	Total
North	80	9	29	38	9	22	31	0	7	7	13	8	21	5	16	21
South	94	6	40	46	6	28	34	0	12	12	9	14	23	8	17	25
West	121	5	56	61	5	38	43	0	18	18	14	16	30	14	16	30
East	120	7	55	62	7	36	43	0	19	19	13	16	29	2	27	29
	415	27	180	207	27	124	151	0	56	56	49	54	103	29	76	105

Summary

- In response to the surge of COVID-19 cases across the globe, the Sri Lankan government imposed an island-wide police curfew on 20 March 2020, followed by lockdowns and travel restrictions of varying nature[1]. This study was conducted by Oceanswell to analyse the impacts of these restrictions on the coastal fishing communities around the island.

- Four hundred and fifteen surveys were conducted across 13 study sites along the coast of Sri Lanka from 29 July to 29 August 2020. The government had not reported community spread during this period. The main known impacts of COVID-19 on fisheries in Sri Lanka prior to the survey period were due to the island-wide curfew, cross border mobility restrictions and trade regulations.

- Among the surveys conducted, 25% were from female fisheries actors, a majority of whom were processors.

- The study included fishers, sellers/traders and processors, all of whom reported that restrictions negatively impacted their respective fisheries related activity. The inability of fishers to go to sea disrupted the whole fisheries value chain. Eighty four percent of the respondents reported a decrease in their income, which could be attributed to the inaccessibility to the fisheries related activity, the decrease in consumer demand and the steep decline in export.

- A comparatively lower number of processors reported that the lockdown negatively impacted their work. This could be due to the longer shelf-life of their product, which renders more control over their stocks during market shocks such as this.

- Sea food price showed no clear trend in any direction. However, a larger number of offshore/deep-sea fishers reported a decline in seafood price[2]. This could be attributed to the fact that they catch high value seafood, which was impacted by the decrease in purchasing power, trade restrictions and the decrease in export demand.

- The most common adaptation strategies reported were utilising savings and credit services, while a small number of respondents mentioned that they depended on the government allowance provided. The respondents requested financial assistance and better suited financial services such as lower interest loan schemes.

- Overall, this study showed that the inaccessibility to the ocean, and thereby fishing, negatively impacted small scale fisheries communities due to limited coping strategies and lack of alternative modes of income.

- The results of this study can be used as a model to predict and prepare for unforeseen shocks that can limit access to seafood stock and disrupt the fisheries value chain. The consequences of overfishing, climate change and climate change-induced factors such as storm surges, sea level rise and coastal flooding are examples of potential future shocks that can threaten seafood stocks and limit access to them. The results of which would render traditional fishing grounds unproductive and fishing gear and methods ineffective[3]. In response, larger vessels, longer trips and the development of new gear will be crucial to a viable future of the industry, these adaptation strategies will be more challenging for the increasingly vulnerable small-scale fishers[4].

- These compounding effects, along with pre-existing vulnerabilities, related to structural, social and economic inequality, can in turn increase the effect that COVID-19 and similar shocks will have on health and socio-economic factors in fisheries communities [5].

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- ලෝකය පුරා කෝවිඩ්-19 ආසාදිතයින් සංඛ්‍යාව ක්ෂණිකව ඉහළ යෑම නිසා ශ්‍රී ලංකා රජය විසින් 2020 මාර්තු 20 වැනිදා මුළු දිවයිනටම පොලිස් ඇඳිරිනීතිය ඇතුළු සංචරණ සීමා පනවනු ලැබුවා. මෙම සංචරණ සීමා හා ඇඳිරිනීති මඟින් දිවයින පුරා වෙසෙන ධීවර ප්‍රජාවට ඇතිවූ බලපෑම විශ්ලේෂණය කිරීම අරමුණු කරගනිමින් Oceanswell සංවිධානය මඟින් මෙම අධ්‍යනය සිදු කරනු ලැබුවා.

- 2020 වසරේ ජූලි 29දා සිට අගෝස්තු 29 දක්වා ශ්‍රී ලංකා වෙරළ තීරයේ තෝරාගත් ස්ථාන 13ක සමීක්ෂණයන් හාරසිය පහළොවක් සිදු කරනු ලැබුවා. මේ දින වනවිට රජය විසින් කෝවිඩ්-19 සමාජ ව්‍යාප්තියක් සිදුවී තිබෙන බවට කිසිඳු සඳහනක් කර නොතිබුණු අතර අධ්‍යනයට පෙර ධීවර ප්‍රජාවට කෝවිඩ්-19 මඟින් ඇතිවූ බලපෑම් බවට හඳුනාගෙන තිබුණේ දිවයින පුරා ඇඳිරිනීතිය, ප්‍රදේශ අතර ගමනාගමනය අවහිර වීම හා වෙළෙඳ කටයුතු සඳහා පනවා තිබූ නියාමනයන්ය.

- සියලු සමීක්ෂණයන් අතුරෙන් 25%ක් කාන්තාවන්ගේ වන අතර එයින් සැලකියයුතු පිරිසක් ධීවර ක්ශේත්‍රය තුළ සැකසුම්කරුවන් ලෙසින් සේවය කරනු ලබනවා.

- මෙම අධ්‍යනය සඳහා ධීවරයින්, වෙළඳුන් හා සැකසුම්කරුවන් සහභාගි කරගෙන ඇති අතර ඔවුන් සියලු දෙනාම කෝවිඩ්-19 හේතුවෙන් පනවනු ලැබූ තහංචි ඔවුන්ගේ ධීවර ක්ශේත්‍රය හා සම්බන්ධ කටයුතු වෙත සෘණාත්මකව බලපා තිබෙන බව ප්‍රකාශ කර තිබේ. ධීවරයින්ට එම කටයුතු සඳහා මුහුදු යෑමට නොහැකි වීම නිසා සමස්ත ධීවර අගය දාමයටම බාධා ඇති වී තිබේ. සමීක්ෂණයට සහභාගි වූ පිරිසෙන් 84%කගේ අදායම පහත වැටී තිබෙන අතර ඒ සඳහා හේතු ලෙසින් ධීවර කටයුතු සිදුකර ගැනීමට තිබෙන බාධා, පාරිභෝගික අවශ්‍යතා පහත වැටීම හා අපනයන කටයුතු සීඝ්‍රයෙන් පහත වැටීම වැනි කරුණු පෙන්වා දිය හැකියි.

- සංසන්දනාත්මකව බලන විට සංචරණ සීමා ඇතුළු තහංචි තම කටයුතු සඳහා සෘණාත්මකව බලපා ඇති බව පවසන්නේ සැකසුම්කරුවන්ගෙන් සුළු පිරිසකි. එයට හේතුව විය හැක්කේ සැකසුම් නිශ්පාදන කල්තබා ගැනීමේ හැකියාව වැඩි නිසා ඔවුනට මෙවැනි වෙළෙඳපොළ හදිසි විචල්‍යතාවයන් හමුවේ තම නිශ්පාදන පාලනය කිරීමට ඇති හැකියාවයි.

- මුහුදු ආහාර මිළ ගණන් වෙනස්වීමේ විශේෂ ප්‍රවණතාවක් නොමැති නමුත් ගැඹුරු මුහුදේ කර්මාන්තයෙහි යෙදෙන ධීවරයින් විශාල ප්‍රමාණයක් මුහුදු ආහාර වල මිළ පහත වැටී තිබෙන බව ප්‍රකාශ කර තිබෙනවා. එයට හේතූන් ලෙසින් දැක්විය හැක්කේ ඔවුන් අල්ලා ගන්නේ වටිනාකමින් ඉහළ මුහුදු ආහාර වන අතර එයට වෙළෙඳ කටයුතු සඳහා පනවා තිබෙන නියාමනයන්, අපනයන කටයුතු අඩාල වීම් හා පාරිභෝගිකයන්ගේ මිළදී ගැනීමේ බලය අඩුවීම් වැනි කරුණු බලපෑම් කර ඇත.

- ධීවර ප්‍රජාව විසින් තම ආදායම පහත වැටීමට ප්‍රතිචාර ලෙසින් වඩාත් සුලබව භාවිතා කර තිබුණේ ඉතුරුම් මුදල් භාවිතයට ගැනීම හා ණය පහසුකම් ලබා ගැනීම වැනි උපාය මාර්ගයි. මීට අමතරව සුළු පිරිසක් රජය විසින් ලබාදුන් දීමනාවෙන් පමණක් යැපී තිබෙන අතර සමීක්ෂණයට සහභාගි වූවන් මූල්‍යාධාර හා අඩු පොළී ණය සේවා වැනි ඔවුනට වඩාත් ගැලපෙන මූල්‍යමය සේවාවන් ඉල්ලා තිබෙනවා.

- සමස්තයක් ලෙස ගත් විට මෙම අධ්‍යනය මඟින් සාගරය වෙත ප්‍රවේශ වීමට නොහැකිවීම, එම නිසා ධීවර කටයුතු හි නිරත වීමට හැකියාව නොලැබීමෙන් කුඩා ධීවර ප්‍රජාව වෙත සෘණාත්මක බලපෑමක් එල්ල වී

තිබෙන්නේ ඔවුනට ඊට මුහුණදීමට ඉතා සීමිත උපාය මාර්ග ප්‍රමාණයක් පැවතීම හා ඔවුන් සතුව අමතර ආදායම් මාර්ග නොමැති වීම බව සොයාගෙන ඇත.

- මෙම අධ්‍යනයේ ප්‍රතිඵල, අනාගතයේදී ධීවර අගය දාමයන්ට බාධා වන, මුහුදු ආහාර ලබාගැනීමට අපහසු වන ආකාරයේ බිඳවැටීම් කල්තබා හඳුනාගැනීමට හා ඒවාට සූදානම් වීම සඳහා ආදර්ශකයක් ලෙසින් භාවිතා කල හැකිය. අනාගතයේදී එවැනි බිඳවැටීම් ඇති වීමට හේතු ලෙසින් ප්‍රමාණය ඉක්මවා මසුන් ඇල්ලීම, දේශගුණික විපර්යාස හා එමඟින් ඇතිවන බලපෑම් වන කුණාටු, මුහුදු මට්ටම ඉහළ යෑම හා වෙරළබඩ ප්‍රදේශ ජලයෙන් යටවීම වැනි දෑ දැක්විය හැකිය. මෙහි ප්‍රතිඵලයක් ලෙස සාම්ප්‍රදායික මසුන් ඇල්ලීමේ ස්ථාන ඵලදායි නොවීම, සාම්ප්‍රදායික ආම්පන්න හා ක්‍රම ඵලදායි නොවීම වැනි දෑ සිදු විය හැකියි. ප්‍රමාණයෙන් විශාල යාත්‍රා, ගැඹුරු මුහුදේ මසුන් ඇල්ලීම හා නවීන තාක්ෂණයෙන් යුත් ධීවර ආම්පන්න භාවිතා කිරීම වැනි දෑ ධීවර කර්මාන්තයෙහි අනාගතය සාර්ථක කර ගැනීමට විසඳුමක් ලෙසින් භාවිතා කිරීමට හැකි වූවත්, මෙම අනුගතවීමේ උපාය මාර්ග දිනෙන් දින අවදානමකට ලක්වන කුඩා පරිමාණ ධීවරයන්ට තවත් අභියෝගාත්මක වේ.

- මෙම බලපෑම් දැනට පවතින ව්‍යුහාත්මක, සමාජයීය හා ආර්ථික අසමතුලිතතා සමඟ සංයෝජනය වූ විට කෝවිඩ්-19 හා ඒ හා සමාන කම්පනයන් විසින් කුඩා පරිමාණ ධීවර ප්‍රජාවන්ගේ සෞඛ්‍ය හා සමාජ ආර්ථික තත්වයන් වෙත ඇතිවන බලපෑම තීව්‍ර වේ.

ස්තූතිය

මෙම ව්‍යාපෘතිය සඳහා මුදල් ලබාදීම වෙනුවෙන් ණෙව් Eන්ග්ලන්ඩ් ඇඤ්ඤුඅරිටම් හි සමුද්‍ර සංරක්ෂණ ක්‍රියා අරමුදල වෙනුවෙන් අපගේ හදපිරි ස්තූතිය පිරිනමනු ලබනවා. මෙම සමීක්ෂණයට සහභාගි වූ සියලු දෙනාටම ඔවුන්ගේ සහයෝගයට හා දායකත්වයට ස්තූතිය පිරිනමන අතර ජෙගතීස්වරී එහම්පරම් ගුණසිංහම් මහත්මියට උතුරු හා නැගෙනහිර ප්‍රදේශ වල කටයුතු කළ අපගේ පර්යේෂණ සහකරුවන් හා සම්බන්ධ වීම සහ සමීක්ෂණයන් හි තත්ව පරීක්ෂාව සිදු කිරීම සම්බන්ධයෙන් විශේෂ ස්තූතියක් පිරිනමනු ලබනවා. ඊට අමතරව සියලුම සම්මුඛ පරීක්ෂණයන් මෙහෙය වූ අපගේ පර්යේෂණ සහකරුවන් වන කෞශල්‍යයා බාලසූරිය, දිලිනි ගමගේ, මනූජ හෙන්දෙවිතාරන, ඉෆ්ලාල් ඉල්‍යාස්, තමිලිනි කනේශාලින්ගම්, මොහොමඩ් මුජාස්, කජන්තිනි රජනලෙන්ද්‍රන්, ශලංක රන්ජුල, රිෆ්ධා රිස්වාන්, ඇන්ටනි සන්තෝශ්, සරන්‍යා සින්නතුරෙයි, සතියවකීස්පරන් සිවනාදන්, අබිලාගිනි වික්‍රමන් සහ මුතුලින්ගම් යුහින්තන් වෙත අපගේ ස්තූතිය පුද කරනවා. ව්‍යාපෘතිය සැකසීම සඳහා දායක වූ ඊශා සහ නදුනි මල්ලිකා ආරච්චි වෙත අපගේ ස්තූතිය හිමිවනවා. මෙම ව්‍යාපෘතිය සඳහා දත්ත විශ්ලේෂණයෙන් දායක වූ ආචාර්ය නෙලී කාඩාගි මහත්මිය වෙත ඇයගේ සහයෝගය සඳහා අපගේ විශේෂ ස්තූතිය හිමිවනවා.

தமிழ் மொழியாக்கம்

சத்தியவாகீஸ்பரன் சிவந்தன்

- COVID-19 தொற்று உலகெங்கிலும் அதிகரித்துள்ளதன் காரணமாக, இலங்கை அரசாங்கம் 2020 பங்குனி 20 அன்று நாடு முழுவதும் பொலிஸ் ஊரடங்கு உத்தரவை விதித்ததுடன், அதைத் தொடர்ந்து பல்வேறு விதமான முடக்கல்கள் மற்றும் பயண கட்டுப்பாடுகள் நடைமுறைப்படுத்தப்பட்டன. இந்த ஆய்வானது இந்த கட்டுப்பாடுகளால் இலங்கைத்தீவைச் சுற்றியுள்ள கரையோர மீன்பிடி சமூகங்களுக்கு ஏற்பட்ட தாக்கங்களை ஆய்வு செய்ய ஓசியன்ஸ்வெல்ஸ்ஸினால் மேற்கொள்ளப்பட்டது.

- 2020 ஜூலை 29 முதல் ஆகஸ்ட் 29 வரையான காலப்பகுதியில் இலங்கை கரையோரத்தில் தெரிவு செய்யப்பட்ட 13 ஆய்வு தளங்களில் நானூற்று பதினைந்து ஆய்வுகள் நடத்தப்பட்டன. இந்த காலகட்டத்தில் அரசாங்கம் சமூகத் தொற்று என்பதை அறிவித்திருக்கவில்லை. இந்த ஆய்வு மூலமாக அறியப்பட்ட இலங்கையில் மீன்பிடித்துறை மீதான COVID-19 இன் முக்கிய தாக்கங்களானது தீவு முழுவதற்குமான ஊரடங்கு உத்தரவு, எல்லைகளைக் கடப்பதற்கான பயணக்கட்டுப்பாடுகள் மற்றும் வர்த்தக ஒழுங்குமுறைகள் போன்றவற்றினால் ஏற்பட்டிருந்தன.

- நடத்தப்பட்ட ஆய்வில் 25% ஆன பெண்களே பங்குபற்றியிருந்தனர் என்பதுடன் அவர்களில் பெரும்பாலானோர் கடலுணவு பதனிடுவோர்.

- இந்த ஆய்வில் கடற்தொழிலாளர்கள், விற்பனையாளர்கள் / வர்த்தகர்கள் மற்றும் பதினிடுவோர், இந்தக் கட்டுப்பாடுகளினால் எதிர்மறையாக பாதிக்கப்பட்ட அனைவரும் கவனத்திற்கொள்ளப்பட்டிருந்தனர். கடற்தொழிலாளர்கள் தொழில் நிமித்தம் கடலுக்குச் செல்ல விதிக்கப்பட்டிருந்த கட்டுப்பாடுகள் முழு கடற்தொழில் சார் மதிப்பு சங்கிலியையும் சீர்குலைத்திருந்தது. இந்த ஆய்வில் பங்குபற்றியவர்களில் எண்பத்து நான்கு சதவிகிதத்தினர் தங்கள் வருமானத்தில் குறைவு இருப்பதாகக் கூறினர். மீன்பிடி தொடர்பான நடவடிக்கைகளில் ஈடுபடமுடியாமை, நுகர்வோரின் கடலுணவுகளுக்கான தேவை குறைவடைந்தமை மற்றும் ஏற்றுமதியில் ஏற்பட்ட சடுதியான வீழ்ச்சி ஆகியவை இந்த வருமானக்குறைவிற்கு காரணமாக இருக்கலாம்.

- ஒப்பீட்டளவில் குறைந்த எண்ணிக்கையிலான பதனிடுவோரே இந்த நாடுமுடக்கல் நிலையானது அவர்களின் செயற்பாட்டினை எதிர்மறையாக பாதித்ததாக தெரிவித்திருந்தனர். இது அவர்களின் உற்பத்திப் பொருட்களின் கூடிய காலாவதிக் காலம் காரணமாக இருந்திருக்கலாம் என்பதுடன், இந்த நிலையானது இது போன்ற சந்தை மாற்றங்களின் போது அவர்களின் சேகரிப்பு மீது அதிக கட்டுப்பாட்டை வழங்குகின்றது.

- கடல் உணவு விலையில் எந்த தெளிவான போக்கும் காணப்படவில்லை. இருப்பினும், அதிக எண்ணிக்கையிலான ஆழ்கடல் மீனவர்கள் கடல் உணவு விலையில் சரிவு இருந்ததாக தெரிவித்திருந்தனர். அவர்கள் பிடிக்கும் அதிக மதிப்புள்ள கடல் உணவுகளின் மீதான வாங்கும் திறனில் ஏற்பட்ட வீழ்ச்சி, வர்த்தக கட்டுப்பாடுகள் மற்றும் ஏற்றுமதி தேவை குறைவடைந்தமை ஆகியன இந்த நிலைக்கு காரணமாக இருந்திருக்க முடியும்.

- இந்த நிலையினை சமாளிப்பதற்காக அவர்களுடைய சேமிப்புகளைப் பயன்படுத்துதல் மற்றும் கடன் சேவைகளைப் பயன்படுத்துதல் என்பன இந்த ஆய்வின் போது கூறப்பட்ட உத்திகளாக இருந்ததுடன், அதே நேரத்தில் ஒரு சிறிய எண்ணிக்கையிலானவர்கள் தாங்கள் அரசாங்கம் வழங்கிய இடர்காலக்கொடுப்பனவை சார்ந்திருந்ததாகக் குறிப்பிட்டிருந்தனர். பதிலளித்தவர்கள் நிதி உதவி மற்றும் குறைந்த வட்டிக் கடன் திட்டங்கள் போன்ற சிறந்த நிதிச்சேவைகளை கோரியிருந்தனர்.

- ஒட்டுமொத்தமாக இந்த ஆய்வு, தொழில் நிமித்தம் கடலுக்கு செல்ல முடியாத நிலை காணப்பட்டது என்பதைக் காட்டுவதுடன், வரையறுக்கப்பட்ட சமாளிக்கும் உத்திகள் மற்றும் மாற்று வருமான முறைகள் இல்லாமை போன்ற காரணிகளால் சிறியளவிலான கடற்தொழில் சமூகங்கள் எதிர்மறையாக பாதிக்கப்பட்டிருந்தன என்பதையும் கண்டறிகின்றது.

- இந்த ஆய்வின் முடிவுகள், கடல் உணவுகளை பெற்றுக்கொள்ளக்கூடிய தன்மையினை மட்டுப்படுத்தக்கூடிய நிலைகள் மற்றும் கடற்தொழில் மதிப்பு சங்கிலியின் சீர்குலைவுகள் போன்றவற்றினை ஏற்படுத்தக்கூடிய எதிர்பாராத நிகழ்வுகளை எதிர்வு கூறவும், அந்த நிலைகளுக்கான தயார்படுத்தல்களை மேற்கொள்வதற்குமான ஒரு மாதிரியாக பயன்படுத்தப்படலாம். மிகையான மீன்பிடித்தல், காலநிலை மாற்றம் மற்றும் காலநிலை மாற்றத்தால் தூண்டப்பட்ட காரணிகளான புயல், கடல் மட்ட உயர்வு மற்றும் கரையோர வெள்ளம் போன்றவை எதிர்காலத்தில் ஏற்படக்கூடிய பாதிப்பான சூழ்நிலைகளாக இருக்கலாம் என்பதுடன், அவை கடல் உணவின் அளவுகளைஅச்சுறுத்தும் மற்றும் அவற்றுக்கான அணுகலைக் கட்டுப்படுத்தும் காரணிகளாக அமையலாம். இதன் முடிவுகள் பாரம்பரிய மீன்பிடி இடங்களை உற்பத்தித்திறனற்றவையாக மாற்றுவதுடன் மீன்பிடித்தலுக்கு பயன்படுத்தப்படும் மீன்பிடி உபகரணங்கள் மற்றும் முறைகளை வினைத்திறனற்றதாக மாற்றலாம். எதிர்காலத்தில் இந்த நிலையினை எதிர்நோக்குவதற்காக பெரிய மீன்பிடிக்கலன்களை பயன்படுத்தல், நீண்ட கடற்தொழில் பயணங்கள் மற்றும் புதிய மீன்பிடி உபகரணங்களின் வளர்ச்சி ஆகியவை சாத்தியமான முன்மொழிவுகளாக இருக்கும் என்பதுடன், இந்த சமாளிப்பு உத்திகள் அதிகம் பாதிக்கப்படக்கூடிய சிறிய அளவிலான மீன்பிடியில் ஈடுபடும் மீனவர்களுக்கு மிகவும் சவாலாக இருக்கும்.

- கட்டமைப்பு, சமூக மற்றும் பொருளாதார சமத்துவமின்மை தொடர்பான ஏற்கனவே இருக்கும் பாதிப்புகளுடனான கூட்டு விளைவுகள், COVID-19 மற்றும் இதேபோன்ற எதிர்பாராத நிலைகளினால் கடற்தொழில் சமூகங்களின் சுகாதார மற்றும் சமூக-பொருளாதார காரணிகளில் ஏற்படக்கூடிய விளைவுகளை அதிகரிக்கும்.

நன்றியறிதல்

இந்த திட்டத்திற்கு நிதியுதவியளித்த நீர்வாழ் உயிரினக்காட்சியகத்தின் கடற்பாதுகாப்பு நடவடிக்கை நிதியத்திற்கு (New England Aquarium's Marine Conservation Action Fund) நன்றி தெரிவிக்க விரும்புகிறோம். இந்த ஆராய்ச்சியில் பங்குபற்றியமை, ஒத்துழைப்பு வழங்கியமை மற்றும் பங்களித்தமைக்காக பதிலளித்தவர்களுக்கு நாங்கள் நன்றிகளைத் தெரிவித்துக்கொள்கின்றோம். மேலும், வடக்கு மற்றும் கிழக்கு கரையோரங்களில் உள்ள எங்கள் ஆராய்ச்சி உதவியாளர்களை ஒருங்கிணைத்தமை, கணக்கெடுப்புகளின் தர சரிபார்ப்பு செயல்முறைக்கு உதவிய திருமதி ஜெகதீஸ்வரி ஏகாம்பரம் குணசிங்கம் அவர்களுக்கு எங்கள் நன்றியைத் தெரிவித்துக் கொள்கிறோம். மேலதிகமாக, நேர்காணல்களை நடாத்திய எங்கள் ஆராய்ச்சி உதவியாளர்களின் பணியை பாராட்டுகின்றோம்: கௌசல்யா பாலசூரிய, திலினி கமகே, மனுஜா ஹெண்டவிதாரன, இஃப்லால் இலியாஸ், தமிழினி கணேசலிங்கம், முஹம்மது முஜாஸ், கஜந்தினி ராஜநளேந்திரன்,

ஷாலங்கா ரஞ்சுலா, ரி ஃப்தா ரிஸ்வான், அந்தோனி சந்தோஷ், சரண்யா சின்னத்துரை, சத்தியவாகீஸ்பரன் சிவந்தன், அபிலாகினி விக்ரமன் மற்றும் முத்துலிங்கம் யுஹிந்தன். இந்த அறிக்கையை தயாரிப்பதற்கு ஒத்துழைப்பு வழங்கிய இஷா மற்றும் நடுனி மல்லிகா ஆராச்சி ஆகியோருக்கு நன்றிகளைத் தெரிவித்துக்கொள்கிறோம். இந்த அறிக்கையினைத் தயாரிப்பதற்காக மேற்கொள்ளப்பட்ட தரவு பகுப்பாய்விற்கு ஒத்துழைப்பு வழங்கிய கலாநிதி. நெல்லி கடகி அவர்களுக்கு நன்றிகளைத் தெரிவித்துக்கொள்கிறோம்.

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ISBN 978-624-5751-00-6