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A “new normality” for small-scale artisanal Fishers? The case of unregulated fisheries during the COVID-19 pandemic in the Bahía Blanca estuary (SW Atlantic Ocean)

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ABSTRACT

The current COVID-19 pandemic is causing health and economic crises worldwide, but consequences are worse for those emerging countries with poor sanitary conditions struggling against economic recessions. Small-scale artisanal fishers (SSAF) should be considered among the “essential workers” since they provide food services; however, the COVID-19 might have altered the normal livelihood and reduced people economic incomes in an already marginalized sector. This situation highlights the fishers’ vulnerability, derived from changes in fish stocks caused by climate change, pollution, overharvesting, and informal work (illegal, unreported and unregulated fishing). Therefore, the so-called “new normality” raises big questions about the management of coastal areas and fisheries in developing countries. As a study case, we proposed exploring SSAF from an Argentinian estuary, the Bahía Blanca estuary (SW Atlantic Ocean). Most of them are unregulated after a reconversion program carried out by the local government in 2012. After reviewing the current COVID-19 legislation for coastal fisheries and having virtual encounters with SSAF, we observed they are struggling against the economic crisis caused by the pandemic. According to our observations, imperative measures must be taken to prevent fisheries collapse in the area. In this work, we present a reference point for the post-pandemic management of fisheries that could be considered for emerging public policies.

1. Introduction

1.1. A new coronavirus: the COVID-19 pandemic

During the earliest days of the current year, a new virus caused a pandemic, with the first cases reported in Wuhan city, Popular Republic of China, on December 31st of 2019. The Chinese Center for Disease Control and Prevention identified a new coronavirus SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2), as the agent causing this outbreak and named it COVID-19 (coronavirus disease 2019). On January 30th, 2020, the World Health Organization (WHO) declared the outbreak a public health emergency of international concern (Hao et al., 2020). Wuhan followed a strict lockdown and stay-at-home policy for all

residents to stop community transmission. Isolation was implemented for all patients and individuals and their close contacts suspected to have contracted the virus, along with improved medical resources to control the outbreaks of COVID-19 (Hao et al., 2020).

A study by Zhou et al. (2020) outlined that SARS was present in bats populations of *Rhinolophus affinis* from Wuhan food markets and might have recombined in humans into SARS-CoV-2 that spreads only human-to-human. This study refused the idea that the virus was airborne and/or zoonotic transmitted (Lam et al., 2020; Zhou et al., 2020). For scientists, this virus provides an opportunity to rethink the human-nonhuman beings’ relationships, the exploitation of nature and stricter regulations against wildlife domestication and consumption to avoid future zoonotic transmissions.

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By March 11th 2020, the WHO declared it a global pandemic with thousands of deaths and contagions in the world because of the high virulence rates and the short period of the illness incubation (Deshpande and Parwe, 2020; Jiang et al., 2020; Lai et al., 2020). Global directions were given to all the countries to avoid the COVID-19 incidence and mortality and prevent the health systems' collapse, being the lockdown, confinement (quarantine) and social distancing the most controversial and effective actions (Medeiros de Figueiredo et al., 2020). These measures are, in part, controversial since they are expected to have several negative economic consequences on commercial activities, causing a strong global recession and mainly affecting some highly susceptible and vulnerable groups and sectors (Coibion et al., 2020).

1.2. Emerging impacts of the COVID-19 on small-scale artisanal fisheries (SSAF)

As we stated before, the new COVID-19 pandemic affected the economy since the demand drastically decreased due to confinement. As an example, summer tourism in Europe vanished. Consequently, the demand for seafood in hotels and restaurants decreased, causing price drops in Mediterranean fisheries of 20%–70% (data from the European Market Observatory for Fisheries and Aquaculture), along with high weekly price instability in other European fisheries (OECD, 2020). Plus, based on one of the first hypotheses that the COVID-19 might have been caused by seafood ingestion, fisheries, in particular, experienced a sense of lousy image during the first phase of the outbreak, with economic consequences. Even though it is still premature to address the socio-economic effects on the global maritime economy originated by the lockdown measures, authors such as Depellegrin et al. (2020) estimated for the coastal region of Veneto (Italy) a loss of 60% (~€1,5 million) of the fishers' economic incomes compared to the same period in 2019. Bennett et al. (2020) concluded that the possible effects of the COVID-19 pandemic are substantially variable between regions, but the short- and long-term effects of COVID-19 marginalize fishers and coastal communities, who are already vulnerable to many socio-ecological challenges (Allison et al., 2009; Noceti, 2017a; Truchet and Noceti, 2021). Fisheries faced complete or random shutdowns because of the preventive measures, and as, they were not considered vital to national food supply systems (Bennett et al., 2020). Big questions remain unanswered regarding these coastal communities, such as if they could cope with the present global pandemic socio-economic effects and how public policies would manage fisheries in this new scenario.

In South America, countries like Brazil have had one of the fastest-growing COVID-19 epidemics globally, and it is estimated that about 21% of the continent could be at risk of severe COVID-19 illness (De Souza et al., 2020). In Argentina, the province of Buenos Aires registered one of the most significant outbreaks worldwide in terms of deaths by COVID-19 per million population with 24,752 deaths. In this scenario, the impacts on fisheries remain unknown, and hence, we consider the pandemic emerges as a new opportunity to rethink our role within coastal environments and their communities. Therefore, we might provide new insights into how this group should avoid further marginalization and poverty. In the current study, we systematically analyzed the effects of national lockdown policies and their effects on SSAF and port activities based on the national decrees and fishers' discourses and social media. Our work has a particular emphasis on the Bahía Blanca estuary (Buenos Aires Province, Argentina) as a coastal system-study case, where most SSAF are living in illegality unreported and unregulated conditions (IUUC). Therefore, the objective of this work was to generate new knowledge on how the pandemic affected and continues affecting the SSAF on a daily basis. The information provided could help both stakeholders and policymakers manage more efficiently the eventual crisis scenario affecting people living in and from coastal environments.

2. Materials and methods

2.1. Study area

The Bahía Blanca estuary (hereafter, BBE) (Fig. 1) is a mesotidal Pampean-Patagonian estuary located in the Southwest of Buenos Aires Province of the Southwest Atlantic Ocean. From a physicochemical perspective, it is a homogeneous, hypersaline and eutrophic shallow estuary (Freije and Marcovecchio, 2004). One of the main characteristics is the phytoplankton bloom with the diatom *Thalassiosira minima* as the dominant species. It appears during winter and has high relevance for nutrient cycling (Spetter et al., 2015), food webs, and, thus, for fisheries during all year. Dissolved nutrients from estuarine origin reach El Rincón system in the Argentine Inner Shelf, one of the most ecologically relevant marine areas of Argentina. The BBE is also one of the main scenarios of industrial and portuary activities in Argentina and South America since it has the main petrochemical complex of the country and the deepest port maintained by continuous dredging. Thus, along with untreated sewage discharges from the different coastal towns and cities, these human activities have several impacts on the biochemical and ecological cycles of this system (López Abbate et al., 2019).

2.2. SSAF in the Bahía Blanca estuary

Along the shores of the BBE, there are several coastal cities, villages and towns, being Punta Alta city, the village of Villa del Mar, and the towns of Ingeniero White and General Daniel Cerri, the areas where SSAF currently settle (Truchet et al., 2019), and where this study was conducted. SSAF are a community at risk of being lost from the BBE after a socio-ecological conflict has occurred, known as "fishers' conflict". The main actors were fishers' families against the petrochemical complex, the company that provides drinking water and sewage (ABSA), and the management consortium of the Port of Bahía Blanca (Consortio de Gestión del Puerto de Bahía Blanca - CGPBB). SSAF hold them responsible for the decline of commercial fishes' stocks due to the pollution of the estuary and settled a lawsuit (Noceti, 2017a; Truchet, 2018). The conflict ended when most families sold their fishing licenses to the Provincial and Municipal governments to compensate for their retirement. Most of them chose to retire (especially fishers from Ingeniero White), and a few fishers were paid to get better equipment to sail in the outer part of the estuary and other coastal sandy beaches, where the climatic conditions are fierce. However, there are families still in litigation with the CGPBB, ABSA, and petrochemical complex companies. While in 2013, there were 150 fishers' families in the estuary, today only 47 remain in all the BBE coastal districts. The socio-environmental conflict continues, and although fishers have sold their fishing licenses, most of them continue fishing since they could not reconvert their economic activity in an efficient way (i.e., aquaculture). So they sail under IUUC, which increases their situation of vulnerability (Noceti, 2017a) and pushes fishers into practices enclosed in the so-called "illegalisms".

2.3. Remote data collection and analysis

During the time we wrote this manuscript (August–September 2020), Buenos Aires Province was going through the 4th lockdown phase, with 290,000 accumulated cases of COVID-19, almost 1500 in the district of Bahía Blanca, and hence remote working was mandatory and we had to reschedule the methodology into a remote and safer one. First, through the "snowball technique", a virtual questionnaire was sent to 20 fishers. Questionnaires included basic and closed questions about the confinement measures, their livelihoods during the quarantine, and the socio-economic effects of the confinement. We decided to implement semi-structured interviews in lack of response, using the same questionnaire, through phone calls with fishers. Only 10 fishers (men from 30 to

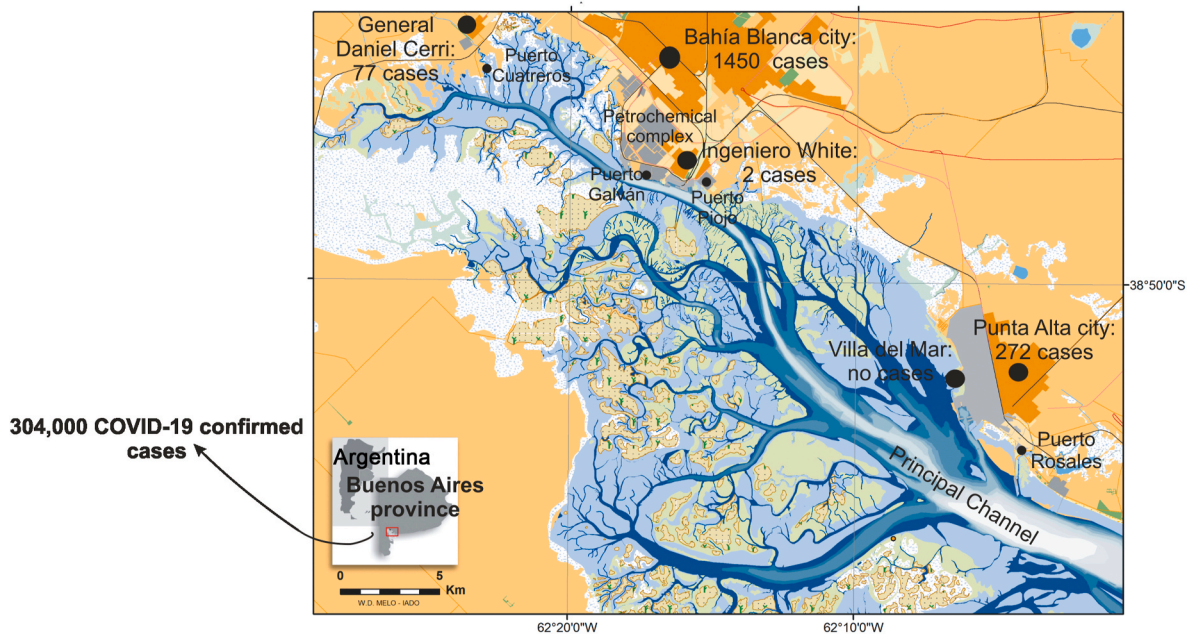


Fig. 1. Coastal areas of the Bahía Blanca estuary (Bahía Blanca, General Daniel Cerri, Punta Alta, Villa del Mar, Ingeniero White), fishers' ports (Villa del Mar, Puerto Piojo, Puerto Rosales and Puerto Cuatreros) and accumulated COVID-19 confirmed cases (until September 2020).

62 years old) from different ports in the BBE (4 from Puerto Piojo, 1 from Puerto Cuatreros, 3 from Puerto Rosales, and 2 from Puerto Alternativo Villa del Mar) (Fig. 1) agreed to the interviews. This methodology proved to be the most effective one to talk to fishers, even when most of them refused to participate because of the IUUC they are going through. Also, we did remote interviews with 2 employees of cold fish stores to inquire about the landing of fish catching and post-harvest dynamics during the pandemic.

For our primary objective, we explored the National Urgency of Decrees (NUD) signed by the President of Argentina, Dr. Alberto Fernández, prior to and during the national lockdown due to the COVID-19 pandemic. Also, we reviewed the recommendations for fisheries during the pandemic of the National Ministry of Agriculture, Livestock and Fisheries. We related this information to the impact on fisheries and port activities on the coastal district of Buenos Aires province based on the evidence from social media and the dialogues with the fishers we interviewed. For our second objective, which was related to characterizing the “new normality” of SSFAF, we analyzed the data from the interviews and their discourses, and discussed them with previous research in the field.

3. Results and discussion

3.1. Lockdown and the “new normality” for SSFAF in coastal districts of Buenos Aires Province

Lockdown measures emphasizing SSFAF in the coastal districts of Buenos Aires Province are summarized in Table 1. SSFAF of the BBE could resume fishing in mid-August 2020, while in other districts of the province, the activity was allowed earlier. Two different reasons could explain this circumstance: first, in the Bahía Blanca and Coronel Rosales districts (where most of the fishing ports are located), the number of COVID cases was higher than in other areas of the province (except the City of Buenos Aires and the Metropolitan Area of Buenos Aires, MABA). Secondly, fisheries in Bahía Blanca and Coronel Rosales are scarcer in number and extremely unregulated (Noceti, 2017a; Truchet, 2018) compared to other fishing spots, such as Mar del Plata. The fact that they are IUUC makes it impossible to achieve similar goals towards the regulation of fisheries in the province during the COVID-19 pandemic

since they are not even organized in cooperatives, like the Cooperative of Artisanal Fishers of the coastal district (Cooperativa de Pescadores Artesanales del Partido de la Costa, COPAC) in the city of Buenos Aires. For example, this cooperative found a way to survive during the earliest stages of the pandemic by providing fish as an essential and safe food to hospitals, health care centers, community kitchens, and popular-open markets with low prices, accessible for many families with low incomes. Also, in Mar del Plata, the COVID-19 pandemic provided an opportunity to regulate the situation of many families of SSFAF that would benefit from new regular incomes that they did not perceive before.

It is necessary to explain that fishing licenses for SSFAF are different depending on the area and the political support for fishers in coastal areas of Argentina. For instance, in Mar del Plata city -which has the biggest SSFAF community with almost 300 families-, they have licenses for sport and recreational fishing, so during the lockdown, they were not considered essential workers and, therefore, they were not allowed to fish. This situation changed at the end of May due to mobilization and a meeting of different organizations in support of SSFAF, such as the Universidad Nacional de Mar del Plata, Instituto Nacional de Investigación y Desarrollo Pesquero (INIDEP), and the Secretary of Family, Peasant and Indigenous Agriculture of the National Ministry of Agriculture, Livestock and Fisheries (Table 1). Therefore, by the end of May, a protocol for resuming fishing was implemented for fishing activities in Mar del Plata. On the other hand, in the BBE, the SSFAF community is smaller in the number of vessels and people, and there was no mobilization since they have never had any political support (Noceti, 2017a; Truchet, 2018).

During this global crisis, the FAO (2020) emphasizes the role of SSFAF in the food supply since fish remains an essential source of animal protein, micronutrients and fatty acids, which are vital in low-income and food-deficit countries. However, in Argentina, it is estimated that only 5 kg of fish are eaten annually per person, whilst in other countries, the annual fish intake is almost 20 kg per person. Thus, the crisis could be an opportunity to introduce fish as a vital, accessible food supply for poor and marginal sectors suffering from hunger. Another consequence was for international markets, where fish exports dropped 6.5% by the end of April 2020 compared to previous years as a result of restrictions and closures and loss of supplies related to COVID-19 (FAO, 2020).

Table 1

Lockdown and preventive measures for small-scale artisanal fisheries (SSAF) in coastal environments of Buenos Aires province (Argentina) with particular emphasis on the Bahía Blanca estuary.

Date	Measure	Characteristics	Relation to SSAF and portuary activities
03/12/2020	NUD 260/2020 Sanitary emergency-Coronavirus (COVID-19)	National Urgency Decree (NUD) signed by the Argentinian president Dr. Alberto Fernandez, announcing the extension of the public emergency in health matters established by law N° 27,541, by the pandemic declared by the WHO concerning COVID-19, for a term of one (1) year from of the entry into effect of this decree	The NUD was signed following the recommendations of the WHO.
03/16/2020	NUD 274/2020	Non-resident foreigners are not allowed to enter the country	Prohibition of entering the national territory, for 15 calendar days, of foreign persons not resident in the country, through ports, airports, international crossings, border centers and any other access point. Prohibition of the descent of foreign crew members.
03/20/2020	NUD 297/2020	The measure of “social, preventive and mandatory isolation” (lockdown) is established for all the people who live in the country or are temporarily in it after the detection of the first cases of Covid 19 in Argentina. (phase I until the 31st of March inclusive). Essential workers (health, food, transport, community kitchens) are excepted following the strict protocols of the WHO.	All ports adhere to the lockdown NUD and close their doors. Only essential workers can enter the port. Activities such as artisanal fisheries are not legally forbidden, but as ports are closed and there are no fishing protocols, they are not allowed to sail nor fishing. Also, most of the fishes cold factories remain closed
03/24/2020	NUD 310/2020	Creation of the Emergency Family Income (EFI)	EFI is for all the informal and formal workers that are affected by the lockdown measures (136.84 dollars per month, 1 peso = 0.014 dollars). Fishers are supposed to receive this income since their activities are not allowed.
27/03/2020	NUD 313/2020	Expansion of the NUD 274/2020 to resident people in the country and Argentines with residence abroad (until the 31st of March)	
03/31/2020	NUD 325/2020	Extension of the lockdown (NUD 297/2020) until the 12th of April	All the coastal ports remain closed in Buenos Aires province.
04/11/2020	Protocol to return to work	A note was presented by the Argentine Association Of Pilot Captains And Fishing Skippers to the Labor Ministry to work again, following the protocols recommended by the WHO.	SSAF is not allowed after one month of national lockdown, and they demand to be included as essential workers.
04/12/2020	NUD 355/2020	Given the increase in infections, the lockdown NUD is extended until the 26th of April	SSAF is not allowed
04/16/2020	Good Practice Guidelines For Agricultural Production For Covid-19	The guidelines include sanitary practices for essential workers in the food industry (including fisheries)	SSAF is not allowed
04/27/2020	NUD 408/2020	Extension of the lockdown until the 11th of May for cities with more than 500,000 inhabitants. Other cities and small towns begin with phase 3	SSAF is yet not allowed in most of the coastal settlements of Buenos Aires province. Ports are working with reduced staff.
05/11/2020	NUD 459/2020	Lockdown is extended in the Metropolitan Area of Buenos Aires (MABA) and the City of Buenos Aires until the 24th of May, with little flexibility. The NUD established new exceptions by area and activity.	The extension of the lockdown is abided by some coastal districts such as Bahía Blanca and Coronel Rosales. Ports are working with reduced staff, and SSAF is not allowed.
05/18/2020	Creation and the first encounter of the Artisanal Fishing Crisis Committee	The Artisanal Fishing Crisis Committee was created to understand the situation of artisanal fishers during the COVID-19 pandemic and to provide some socio-economic tools for fishers. It was organized by the Secretary of Family, Peasant and Indigenous Agriculture of the Ministry of Agriculture, Livestock and Fisheries of the Nation, the Instituto Nacional de Investigación y Desarrollo Pesquero (INIDEP) and the Research Program in Fisheries Economics of Argentina along with some cooperatives of SSAF.	In coastal districts of Buenos Aires province, only the cooperative COPAC was present with the cooperative of SSAF of Puerto Madryn (Chubut) and SSAF of fluvial systems. SSAF from BBE were absent in this meeting.
05/25/2020	NUD 493/2020	Extension of the NUD 459/2020 until 07/07/2020	Same as before
06/07/2020	NUD 520/2020	The Preventive and Mandatory Social Distancing (PMSDi) is established by keeping a minimum distance of two (2) meters between people. Crowded social activities are not allowed. This measure is not applied for the (MABA) and the City of Buenos Aires and other hot spots where COVID-19 cases are high (extension NUD 493/2020).	Same as before
06/29/2020–08/16/2020	NUD 576/2020, 605/2020, 641/2020	Successive NUD that extended the PMSDi, but with some flexibilities, except for the (MABA) and the City of Buenos Aires with the highest contagious rates.	8th of August: The Port of Bahía Blanca registered a record activity of importations (cereals and oils), while SSAF was not legally allowed. 12th of August: coastal districts of Buenos Aires such as Mar del Plata, Coronel Dorrego, Mar Chiquita and are allowed to go back fishing. The following coastal districts are still not allowed and are waiting for further permissions: Monte Hermoso, Pehuen Có, Bahía Blanca, Villarino, Coronel Rosales. SSAF in the BBE can go fishing again with a reduced crew, fewer boats, and following the protocols of the WHO: sanitization, social distancing, face masks. The cold stores open their doors, and the Port of Bahía Blanca is still working with reducing staff and following the measures to avoid COVID-19 spread.
24/08/2020	–	Most of the coastal districts allow fishing, and the lockdown is extended until the 20th of September, with some flexibility but keeping the social distancing.	

Nonetheless, in the ports of Buenos Aires, the exportation of seafood for other countries like China was an essential food supply during the pandemic. In Argentinean local markets, this was suggested by an increase of 0.7% of the total exportation of fish in the mid-2020 compared with 0.32% of the last year (CGPB, 2020). It is necessary to emphasize that these numbers belong to deep-sea fisheries, representing all the exportation, while SSAF contributes to local food consumption.

For the FAO (2020), the policies and actions that the governments should adopt for fishers include measures to protect public health and to avoid socio-economic crisis, such as social assistance (cash transfers), social insurance (health insurance), and labor market programs (for example, unemployment benefits), as well as measures to ensure continuity of the food supply. Consequently, SSAF in Buenos Aires should be considered “essential workers” since they guarantee safe and fresh food. The Ministry of Agriculture, Livestock and Fisheries of Argentina created a guideline for fish workers and deep-sea fishing to avoid COVID-19 spread during the lockdowns. Thus, none of our interviewees were aware of these measures, and artisanal fishing was not allowed because the ports and their buyers (cold stores factories and large markets) remained closed and there were no health protocols for sailing (Table 1). This could also imply that in Argentina, seafood is not considered part of food local sovereignty, and thus, the role of SSAF in food systems in the present and future is well underplayed (Béné et al., 2015).

Regarding social protection measures for informal workers, Argentina implemented the Emergency Family Income (EFI) to be perceived by families without a job or whose job was affected by the pandemic from April to August. However, none of the SSAF of the BBE perceived this payment, and only fishers from Ingeniero White got a unique card with 20,000 Argentinian pesos (1 peso = 0.014 dollars) from the CGPBB to survive for about 5 months of lockdown. Thus fishers from other ports and districts had to look for other incomes to survive during the strict confinement period. Some went fishing even though it was not allowed (especially *Odontesthes* spp. and *Cynoscion guatupuca*) and sold them to fish markets in Bahía Blanca city. Others sold ambulant food, and others used personal or loan savings.

Our work data indeed exhibits a depletion of fishers as essential seafood workers, which coincides with previous studies by Bennett et al. (2020). These authors stated that most of the fisheries worldwide faced complete shutdowns at the onset of social distancing restrictions if they were not considered vital to national food supply systems, as it was observed for the coastal districts in Buenos Aires, especially in the BBE. In Latin American and the Caribbean, for Bucaram et al. (2020), the COVID-19 pandemic deepened the vulnerability of SSAF, since fish production in the region has shown a decline due to industrial overfishing, unregulated fisheries, no economic incentives, and inefficient or inexistent management systems. In the BBE, the fishing sector is informal, fragmented, heterogeneous, and dispersed. The disruption of hotels' activities, restaurants, and marketing chains has deteriorated fishers' situations and provoked a fall in fish and seafood prices, leading to a sustained revenue loss. The same situation was experienced in a coastal touristic area of Italy, where SSAF are fundamental to provide seafood for markets and hotels during summer holidays, but the pandemic caused a severe decline in their profits (Depellegrin et al., 2020).

The COVID-19 situation has left us with uncertainties related to the new normality of SSAF in the coastal districts of Argentina, especially in the BBE. The situation of unregulated and informal fisheries, the lack of social assistance programs and health insurance, and the lack of savings for an unpredicted pandemic scenario modified some aspects of their livelihoods, such as their daily incomes. But the truth is that the absence of regulations for this community has always existed in Argentina and in many countries around the world (i.e., Varkey et al., 2010; FAO, 2016; Okafor-Yarwood, 2017; Kularatne, 2019; among others). The current pandemic only exacerbated and exposed the problems of the sector. As we stated above, in some cases, like Mar del Plata, the COVID-19 represented an opportunity to regulate the current situation of SSAF

families, but this was not considered in the BBE case. Nonetheless, as shown in Fig. 2, even though fishers in Mar del Plata follow some protocols (alcohol, bleach) for sanitization, they are still crowded in small boats with no social distancing in a city with more than 3000 cases confirmed of COVID-19. At this point, we agree with Bennett et al. (2020) since fishers decide to feed their families, and in spite of the possibility to be exposed to COVID-19 infection. Overall, the Argentinian guidelines for essential workers do not consider long-term measures for possible pandemic effects since all the regulations are thought in a short-term period, and while we were writing this manuscript, cities like Mar del Plata returned to a strict phase III, which is bound to cause problems for the sector once again.

3.2. SSAF in the BBE: a “black hole” for COVID-19 measures

Notably, for the case of SSAF of the BBE, all the interviewees were men because they do not consider women as fishers. However, a study by Truchet et al. (2020) demonstrated that women have an essential post-harvest role (cutting, packing and ambulant sale). Other studies by Noceti (2010, 2017b) conclude that children who live in informal and poor settlements of Bahía Blanca city are paid by fish cold stores and markets for the post-harvest of shellfishes, especially to clean and remove the shells of shrimps. One of our informants explained that given this situation of the pandemic, the shutdown of fish factories and the impossibility of fishers to resume fishing deepen the situation of vulnerability of both children and women that were no longer paid since shellfishes are the dominant fishing species during the cold season (April–August). Worldwide, children work is forbidden and according to the FAO (2020), women represent 50% of the workforce in the fisheries and aquaculture sector. Women were significantly affected by the decline in the number of landings and the closure or reduction of processing and marketing activities. They are exposed to all phases of the value chain, and as they are also linked to parenting and education, fatigue and stress are even more remarkable. But no measures for Argentinian fisheries included gender or children's perspectives and inequalities. One of our recent studies (Truchet et al., 2020) exposed that women have an essential post-harvest role in coastal fisheries of the BBE that was not considered within the chain value and was not equally paid, which strongly reproduces the historically unpaid domestic work for women.

Regarding their physical and physiological health, none of the fishermen interviewed stated being aware of a fisher sick with COVID-19. Still, all of them experienced tiredness, exhaustion and sadness due to the confinement and lockdown, the impossibility of fishing, and the uncertainty of returning to work and feeding their families. This supports some of the ideas of the WHO that stated that “the current situation, with isolation, fear, uncertainty and economic crisis, can cause psychological disorders.” Surprisingly, none of the fishers mentioned they were worried about getting sick of COVID-19 because of the few cases registered in the towns and cities where they work (Fig. 1). However, baseline mental health works in Argentina did not consider long-term fear of losing their jobs and economic incomes of vulnerable and marginalized sectors as a triggering of anxiety and sadness (i.e., Alomo et al., 2020), and scientists should further analyze this.

Though they were not genuinely considered as essential workers and thus, they did not receive any health information about how to avoid spreading COVID-19 when fishing was allowed (or when it was not), all of them mentioned they applied the protocols of sanitization and face mask, as the WHO and social media recommended. However, some of them explained that they could not follow the social distancing protocol for Argentina (more than 2 m²) because the boats are small and the fishing operations onboard demand close contacts, especially fishers from Villa del Mar, General Daniel Cerri and Punta Alta because the crew is composed mainly of three people. Meanwhile, SSAF from Puerto Piojo (Ingeniero White) explained that the GCPBB gave some protocols to avoid crowded crews (no more than 2 people) and to prevent many

boats from fishing in the same spots within the estuary at the same time. SSAF kept fishing in irregular situations, fishing factories and cold stores bought their captures without regulated guides, and there was no state control, of any kind, in this chain value.

In this respect, [Okyere et al. \(2020\)](#) analyzed the movements of fishing boats on the coasts of Ghana during the pandemic through remote sensing and suggested paying attention to possible crowding in fish landing sites to prevent the spread of the disease. For these authors, fishing communities are at high risk, serving as potential “hotspots” for the rapid spread of the virus due to the migratory and huddling behavior of fishers, and at times poor hygienic practices. We fully agree with these authors’ statements since there are no long-term measures to avoid spreading the virus and according to all the fishers, the maritime traffic to the main port of the area did not diminish during the pandemic. Moreover, a record of exportations and maritime traffic ([Table 1](#)) of large cargo ships (cereals and oils) was recorded in August 2020 ([CGPBB, 2020](#)). Hence, there is a need for reinforcement of the prevention protocols, particularly the social distancing and the foreign maritime traffic, to maintain food security, livelihoods, and the direct jobs supported by artisanal fishers.

3.3. Policy recommendations for SSAF management in coastal areas of the BBE

SSAF worldwide are experiencing depletion of their activities due to a myriad of anthropogenic impacts, such as overfishing, climate change and pollution ([Pauly and Zeller, 2016](#); [Silvano and Begossi, 2016](#); [Bertrand et al., 2018](#); [Alati et al., 2020](#)). Fishers experience the same situation in the BBE ([Truchet et al., 2019](#); [Truchet and Noceti, 2021](#)) added to labor-intensive, data-poor, unreported and illegal situations, which puts their livelihoods at severe risks. SSAF should be protected and managed through public policies, as they offer ocean employment, fresh and nutritive seafood and also their knowledge has proved to be invaluable for stakeholders in coastal management and ecosystems’ conservation (i.e., [Johannes et al., 2000](#); [Silvano and Begossi, 2012](#); [Wedemeyer-Strombel et al., 2019](#); [Cisneros-Montemayor et al., 2020](#), among others). We must emphasize that after 10 extensions of the quarantine in Argentina, the governments have made significant efforts to mitigate the negative impacts of the health crisis on people who live in poor conditions. But none of the preventive policies have involved long-term measures for marine governance, and none of them protect fishers’ communities. Thus, the COVID-19 provides an opportunity to rethink and reorganize public policies around the regulation of fisheries and food sovereignty, respond to ongoing stressors and political instability, and provide the structural reforms that the sector has required decades.

In [Table 2](#), we reviewed and summed up some pathways proposed by some authors ([Bennett et al., 2020](#); [Bucaram et al., 2020](#); [FAO, 2020](#)) that could be adapted for fisheries in coastal districts of Buenos Aires during the COVID-19 pandemic through the perspective of the social and solidarity economy, especially for the IUUC fishers in the BBE. We also pondered some gender measures that were not considered in this sector to avoid any gender violence, as well as some pathways to avoid child labor, which is a common trend in the BBE fisheries ([Truchet et al., 2020](#)).

4. Conclusions

In the coastal areas of Buenos Aires province, almost 300 fishers’ livelihoods and economies have been severely affected by the current COVID-19 pandemic. To our knowledge, this is the first research analyzing the effects of the pandemic in SSAF of coastal districts in the BBE, a sector that is IUUC. In this new scenario, we asked ourselves if there was a new normality for SSAF during the pandemic. Our results indicated that most of them are struggling against the depletion of their economic incomes by sailing illegally during the complete lockdown in the country, while others look for other incomes by selling ambulant food.

Although the pandemic has affected their subsistence and economy, their overall situation did not drastically change from the past, as IUUC fishers are still dominant in the BBE coasts. In the current pandemic, they have decided to feed their families at the risk of exposure to COVID-19 infection since although they all follow self-care measures, there is a risk of contagion due to overcrowding with no social distancing. Plus, results exhibited that long-term policies were not considered for this sector because they were not considered essential, and they did not receive any healthcare and social measure. This also suggests that seafood was dismissed as a vital food and the situation also led to a collapse in fish demands in markets and cold stores factories. To avoid the depletion and total collapse of SSAF in the BBE and to support the fisheries in the current times, we suggested some measures that stakeholders should consider, including future studies with local and national authorities to understand the ecological and socio-economic consequences of lockdown measures for coastal communities, blue economies and the marine ecosystem.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.



Fig. 2. Example of fishers in a coastal district of Buenos Aires during the COVID-19 outbreak: the case of Mar del Plata city. Pictures are taken from the National Ministry of Agriculture, Livestock and Fisheries.

Table 2

Actions and measures to support and manage small-scale artisanal fishers in the BBE during and after the COVID-19 pandemic.

Actors	Actions and measures
National and local governments	<ul style="list-style-type: none"> ✓ Build long-term baseline policies for SSAF during the pandemic and after it ✓ Create policies to avoid children labor ✓ Prioritize the re-open of SSAF, cold stores and local popular open markets with low prices ✓ Create safe touristic policies for the upcoming summer in beaches of the area and foster seafood consumption ✓ Guarantee and safeguard the entire chain value related to SSAF ✓ Provide economic relief or cash transference through the access of the EFI ✓ Simplify the bureaucratic process for the formalization of fishers' sectors, their boats and registers ✓ Promote the creation of cooperatives to avoid fragmentation and disruption of the sector ✓ Protect and guarantee fishworkers' health
Researchers (remote working)	<ul style="list-style-type: none"> ✓ Research about SSAF socio-economic situation and impacts of the pandemic including a gender perspective to avoid any gender violence during the confinement ✓ Increase the monitoring of IUUC fishers ✓ Include fishers' ecological knowledge (FEK) as an instrument to engage fishers in coastal management during the pandemic ✓ Identify possible solutions ✓ Communicate their results to policymakers related to marine governance
Private sector	<ul style="list-style-type: none"> ✓ Support SSAF through market flexibilities and the creation of funding programs ✓ Support fresh seafood intake for locals in restaurants and hotels following the epidemiologists' recommendations ✓ Evaluate prices that have collapsed during the pandemic to increase the demand ✓ Ensure health and safety for workers of the seafood business
Non-governmental organizations (NOGs)	<ul style="list-style-type: none"> ✓ Assist and co-work with researchers in monitoring impacts of SSAF ✓ Engage with fishers, researches and governments and in the monitoring of coastal areas during the summer holidays with active COVID-19 pandemic ✓ Support SSAF fishers' market with different actions, such as education programs in local schools through virtual platforms and forums, among others.
Small-scale artisanal fishers (SSAF)	<ul style="list-style-type: none"> ✓ Supply fresh and nutritive seafood for hospitals, schools and community kitchens with low prices ✓ Collaborate and engage with actors at different levels to create co-participative policies ✓ Follow the WHO and local governments' recommendations to avoid spreading the virus ✓ Create cooperatives and reinforce the syndicates to protect their jobs and workers. ✓ Create new marketing initiatives, such as door-to-door deliveries, ambulant sales, community markets with other local producers ✓ Take care of their health and their partnerships and demand medical controls

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