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COVID-19 impact on marine and aquatic environment and the economic dimension: A literature review from the Belgian delegates to the ICG-ESA workgroup of OSPAR Commission

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At a meeting of ICG-ESA in spring 2021, Valentijn Bilsen offered to prepare this short paper on the environmental and economic consequences of the Covid19 pandemic, based on a study that was done for the European Environmental Agency and some other literature. This paper contributes to OSPAR's Quality Status Report 2023 but its contents do not reflect the opinions of all OSPAR Contracting Parties and it has not been endorsed by the OSPAR Commission.

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Introduction

Virtually two years after the onset of the COVID-19 crisis in Europe it became painstakingly clear that this worldwide coronavirus outbreak had a significant impact on public health, the economy, human behaviour, and the environment. Appearing in early 2020 in Europe, the epidemic and the containment measures taken to curb it led to a 6% fall in GDP for the Union as a whole (European Commission, 2021). This drop in economic activity in turn generated environmental effects, both beneficial and harmful. In this short study, we provide a concise overview of the main channels through which the pandemic affected the Northeast Atlantic Ocean (NAO) economy, its wildlife and its environment.

We selected three main economic drivers that impacted the wildlife and the environment of the OSPAR maritime area:

1. Impact on the single-use plastics;
2. Impact on the fisheries and aquaculture; and
3. Impact on recreation and tourism activities.

The knowledge we obtained from this analysis is instrumental to seize the extent to which human activity has an impact on the Northeast Atlantic Ocean. It will help decision makers and organizations to take better choices to preserve marine life and the ocean ecosystem that is essential for humanity as a whole.

Objective of this paper

This short paper is meant to provide relevant insight into how COVID-19 has become a relevant factor in economic analyses in general, and in maritime economics specifically. Often overlooked, there are several (complex) feedback loops influencing direct economic activity on the short term but also more indirectly through social and ecological impacts on the longer term. Based on preliminary information we aim to point out the importance for these COVID-19 feedback loops in further

economic analyses of maritime economy. We stress that some COVID-19 related information should be gathered systematically and taken into account in future economic models.

Impact from increased use of single-use plastics (SUP)

Single-use plastic products are products made of plastics, that are meant to be used once, for a short period of time, before being thrown away. Straws, throwaway drinking cups, food and beverage containers, sanitary towels, and other packages and wrappers are all examples of this (Graulich et al., 2021). Single plastic products represent a substantial share in plastic pollution and marine litter. Together with fishing gear, the top ten single-use plastic items discovered on European beaches account for 70% of all marine trash in the EU (European Commission, 2019).

Personal protection equipment

Lockdowns, social distancing measures, and the use of personal protective equipment (PPE) were all part of the COVID-19 policy response. Hitherto the most visible impact of the pandemic has been a rise in demand for PPE, such as face masks, gloves, or hand sanitisers, not only in medical institutions, but also increasingly in general population, as a result of the new national health standards.

While there are no statistics about how many single-use face masks and other personal protective equipment are used in Europe we do have statistics on net imports of personal protective equipment into Europe (Graulich et al., 2021). This gives a good proxy indication of the rise of masks in circulation in the early stages of the outbreak when European production capacity was limited. Imports of face masks into the EU more than doubled compared to pre-pandemic levels, and this occurred at the same time that EU manufacturing increased[1] (Graulich et al., 2021).

Despite the fact that international health organizations have not advised the general population to use gloves as a preventive COVID-19 measure, additional imports of gloves to the 27 EU Member States (EU-27) over and above business-as-usual levels totalled 105,000 tonnes during the first European wave of the COVID-19 epidemic (from April to September 2020), indicating an 80% increase (ECDC, 2021; WHO, 2021).

Packaging

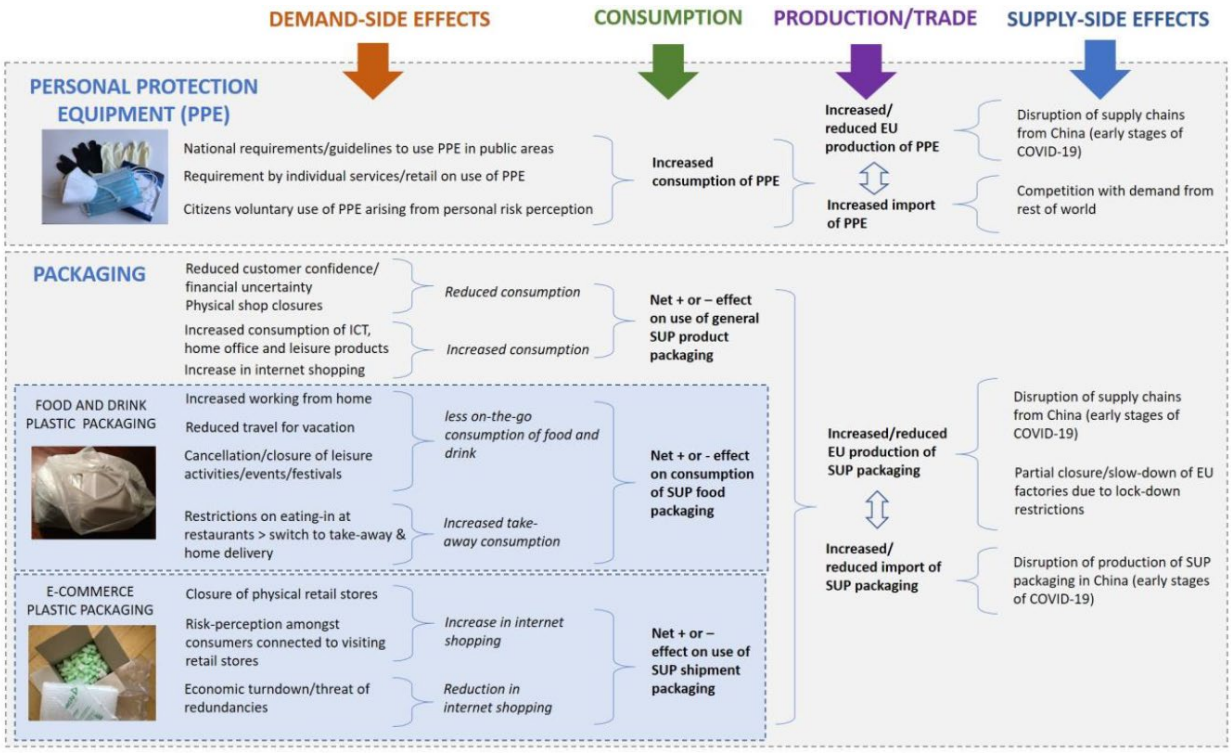
The COVID-19 pandemic also impacted other types of single-use plastics, such as packaging and disposable food containers. For packaging SUP, the effect of the outbreak was ambivalent. The production of single-use plastics was at the same time fostered and dampened by the pandemic. These two effects hit both supply and demand. Numerous people (temporarily) lost their employment as a result of lockdowns in many European nations; more people were forced to work from home; events and leisure activities were cancelled; businesses were closed; and travel was limited.

Regarding food and drink plastic packaging, the drop in the quantity of SUP can be explained by the decrease in total consumption and sales of on-the-go snacks, meals, and drinks, resulting in lower usage of single-use plastic packaging. Conversely, the increase in SUP can be explained by the facts that many companies were forced to turn to take-away and meal delivery when restaurants and cafés closed for on-site eating, potentially increasing the usage of single-use plastic food containers.

For the e-commerce and plastic packaging, the closure of stores may have reduced shopping and related SUP packaging on the one hand, but on the other hand, it boosted e-commerce, which increases the use of SUP packaging and protective filler materials for shipping reasons.

[1] Assuming an average face mask weight of 2.7 grams, this corresponds to 0.75 extra face masks per person per day for the EU population.

Figure 1:Overview of potential links between the response to COVID-19 and the consumption, production and trade in single-use plastics. Source Graulich et al. (2021)



Source: ETC/WMGE based on compilation PlanMiljø, Oeko-Institut and IDEA Consult

Impact of the change in SUP on the NAO

The growing usage of single-use face masks and gloves has resulted in littering. Littered masks and gloves are found on streets, in rivers, on beaches, along coasts and in the sea (Adyel, 2020; Canning-Clode et al., 2020). Experts warn that fish and birds can ingest soft and flexible plastics. Animals can also become physically entangled (Khan et al., 2021). The OSPAR Commission included face masks and gloves as items to report in marine litter monitoring.

Discarded personal protection equipment is suspected of not only being a substantial source of plastic litter in the environment, but also of microplastic pollution, i.e. plastic fragments smaller than 5 centimetres, because bigger 'meso-plastic' objects can fracture into smaller bits. Aragaw (2020) points out that these masks, when released into the environment, represent an additional source of microplastic pollution to ecosystems and the aquatic environment.

If we consider SUP packaging, few data are available at the moment but (Graulich et al., 2021) compared additional COVID-19-related economic turnover of the e-commerce industry to its total turnover in 2019. The authors showed a 9.1% increase, equating to an estimated 11,400 to 17,600 tonnes of additional plastic packaging used by the sector in response to COVID-19 from March to September 2020. This can give us an approximation of the change.

Impact on the fishing and aquaculture sectors

As the containment measures directly impacted the economic activity as a whole, fishing and aquaculture sectors have been hit hard. In this article, we differentiate the impacts related to the fishery industry from the impacts related to the aquaculture industry. We also investigated the impact of the pandemic on the demand for sea food.

Fisheries
The supply was affected because inspectors and observers were unable to board the vessels. They had to adjust procedures on board to comply with COVID-19 limitations, and alter control routines. As a result, fishing operations were adjusted as vessels were obliged to stay in port due to the lack of demand for particular species. Exports beyond the EU were also restricted for a while (Döring et al., 2021). Fisheries targeting high-value species or selling to the HoReCa sector suffered the most (Pititto et al., 2021).

Aquaculture
Estimates for aquaculture show a 17 percent drop in sales volume and an 18 percent drop in overall income, with the shellfish industry suffering the most. Aquaculture, unlike fisheries, is an industrial operation, which implies that a producer has some control over supply (and on prices). Many farmers who had previously supplied to HoReCa chose to remain producing or stockpile their produce in order to prevent a price drop (Pititto et al., 2021).

Demand for sea food
Foodservice and institutional sales fell, but retail sales climbed. Anecdotal information from merchants shows that demand for processed fish products, particularly canned, frozen, and smoked fish, was consistent and robust. The rise in domestic consumption did not compensate for the reduction in out-of-home consumption, probably because some items are intrinsically difficult to prepare at home, and customers chose simpler options to fish (Pititto et al., 2021).

Impact of the change fishing and aquaculture on the NAO

The reduction in fishing in 2020 may have led to have long-term beneficial ecological effects to stocks and ecosystems, although this cannot be proven until stock assessments are updated with data from 2020 and following years (Graulich et al., 2021).

The direct effect of the fall of commercial fleet is easy to grasp. Less fishery activity allows endangered marine species to have more time to reproduce. Between February and June or July 2020, the COVID-19 lockout helped fish populations and other marine creatures recover faster (Khan et al., 2021).

The COVID -19 epidemic has led to a worldwide decline in commercial shipping activities. This reduction of nautical activity had repercussions on the noise pollution near the ports (Čurović et al., 2021), but also on the high seas. Reduction in noise pollution in the ocean can be beneficial marine animals (Livemore, 2020).

Impact on the recreation and tourism activities

In 2018, Europe accounted for 51% of all foreign visitor arrivals, making it the most popular tourist destination on the planet. In the same year, half of all tourist lodging establishments in Europe were located along the shore. Furthermore, tourism and leisure activities in coastal areas are expanding at a far quicker rate than other human activities (RWS INFORMATION, 2020).

Tourism was projected to increase even more in 2020, but the COVID-19 epidemic in Europe has put the sector under significant strain. The total nights spent by tourists dropped by 52 percent in

2020 compared to 2019[2]. On top of that, the industry was swamped with claims for reimbursements on cancellations and non-performance of services. Despite the European Commission's and Member States' efforts to minimize the consequences, the long-term economic impact remains unknown (RWS INFORMATION, 2020).

Impact on the recreation and tourism activities on the OSPAR environment and wildlife

The absence of visitors as a result of the current coronavirus pandemic's social distancing measures has resulted in a noticeable shift in the appearance of numerous clean beaches throughout the world (Zambrano-Monserrate et al., 2020). This limited human activity on beaches for instance provided turtles enough time to incubate and hatch in peace (Khan et al., 2021).

Therefore it might be expected that the drop in maritime and coastal tourism activities had several beneficial effects on the wildlife of the OSPAR environment. The marine animals appear to benefit from the break in noise and from reduced pollutants. Aquatic creatures are benefitting from the situation (Khan et al., 2021). It was already known that restricted water flow was directly related to a reduction in stress hormones with whales, see e.g. (Rolland et al., 2012). This suggests that the reduced COVID-19 activities at the coast and oceans would probably have a rather positive impact on sea wildlife.

Conclusion

In this short study we highlighted several channels through which the COVID-19 pandemic affected the economy as well as the ecosystem of the OSPAR sea area. The outbreak has an ambivalent effect on the single plastic use. There has been a surge in personal protection equipment such as masks, gloves, or hand sanitisers which created an increase in littering that ultimately may have ended up in the Northeast Atlantic Ocean. Besides, we observed a slump in the consumption of food to eat on the go due to the impossibility for people to eat outside their home, or simply due to a reduction of the consumption as a consequence of the increased financial uncertainties. Conversely, there has been a surge in packaging because of the growth of e-commerce which requires a large amount of packaging.

Another economic impact of the COVID shock was the net decrease in marine traffic during the COVID-19 pandemic. This drop in marine traffic activity hit both the fisheries sector and the tourism sector causing beneficial effects for the wildlife of the OSPAR sea area. For instance, sea creatures were no longer disturbed by the noise caused by boats and beaches were more quiet and cleaner. The overfishing was also tempered and it permitted several species to recover.

The main question that remains unanswered is whether the economic and environmental impacts will last over time. With the indications presented above, it appears that the pandemic caused a reduction of pressure on the aquatic and marine eco-system. However given the drive to return as fast as possible to the 'normal' pre-COVID situation, the positive short-term effects are at risk to be annihilated. Therefore further research on the cause and effect links between economy and marine environment in the context of COVID-19 is certainly welcomed.

Finally, we stress the importance of including direct and indirect pandemic effects into economic models. Therefore, data should systematically be gathered and integrated in the analyses.

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Our vision is a clean, healthy and biologically diverse North-East Atlantic Ocean, which is productive, used sustainably and resilient to climate change and ocean acidification.

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