

Original Research Article

Economic Impact of COVID-19 Pandemic on Small-scale Fisher Households in Kerala State

ABSTRACT

Aims: The COVID-19 pandemic caused devastating and far-reaching impacts on the economic construct of several countries. The fisheries sector in India was impacted by the nationwide lockdown from March to May 2020 followed by the regional restrictions at different periods, causing severe disruptions in fishing and marketing activities. The pandemic created disproportionate impacts on various sections of the society. The unorganized workforce representing the poor and marginalized sections of society suffered the worst during the pandemic. In this context, an analysis of the economic impact of the pandemic on small-scale fisher (SSF) households in Kerala was done.

Study design: The fishery income, employment, household consumption, and indebtedness of the small-scale fishers during the pre- and post-pandemic period were analyzed based on the data collected from small-scale fisher households in Alappuzha, Ernakulam and Malappuram Districts in Kerala state. The information on access to relief and support measures and alternate livelihood sources of the fisher households were also collected to assess the economic security of the fisher households during the pandemic.

Place and Duration of Study: The study was conducted during the pandemic years 2020 and 2021 in the selected coastal districts in Kerala state.

Methodology: Alappuzha, Ernakulam, and Malappuram districts of Kerala were selected for the study. Data were collected from respondents operating small-scale motorized fishing units in the selected districts. Snowball sampling was adopted followed by telephonic interviews to collect the information from the fisher households. The survey was administered during the major pandemic years of 2020 and 2021.

Results: The results indicated that the COVID-19 pandemic exacerbated the livelihood constraints of the small-scale fishers who were already in distress with a consistent decline in fish catches, through loss of fishing days, frequent weather warnings, climate hazards, and high fishing costs among others.

Conclusion: The Government transfer payments and relief measures during the pandemic were inadequate and measures to improve the livelihood security and resilience of the fishers through the creation of alternate livelihood options, incentives to compensate for the loss of fishing days, debt relief measures, and sustainable markets are necessary for enhancing the resilience of small-scale fishers.

Keywords: Covid-19 pandemic; economic impact; Kerala; small-scale fishers

1. INTRODUCTION

Fisheries and aquaculture sector provide food and nutrition security besides providing income and employment to millions of people across the world. All aspects of the fishery supply chain were adversely affected during the COVID-19 pandemic putting food security, employment and income at risk [1]. The pandemic disproportionately affected the vulnerable and marginalized people [2]. The small-scale fishing sector employs 90% of the people engaged in fisheries sector with significant contributions to food security, nutrition and livelihoods across the world (ANY REFERENCE TO SUPPORT 90% figure?). The SSF represent the

Comment [JO1]: What about changing to "Socio-economic Impact of COVID-19 Pandemic on Small-scale Fisher Households in Kerala State" since it goes beyond economic to social issues (consumption, indebtedness, relief support)?

Comment [JO2]: Nicely written aim of research but could do well without much upfront details. Revise to have maybe two key opening sentences, then the aim of your research. Move the other details to the introduction.

Comment [JO3]: Deleted this since it repeats what is already stated under place and duration of study.

Comment [JO4]: Give the results you found instead of listing these other potential causes or preexisting causes that COVID-19 exacerbated. Something along the lines of COVID-19 pandemic exacerbated livelihood constraints through declined fishery incomes, reduced employment, reduced household consumption and increased indebtedness (are these what you found out?). Revise and update.

Comment [JO5]: Quite a long sentence that needs breaking down into two:
1. The Government transfer payments and relief measures during the pandemic were found to be inadequate.
2. The study proposes measures to improve the livelihood security and resilience of the fishers through the creation of alternate livelihood options, providing incentives to compensate for the loss of fishing days, debt relief measures, and developing sustainable markets.

Comment [JO6]: The first time using SSF, what do the abbreviations stand for?

most marginalized and vulnerable sections of the population given their dependence on inshore fishery resources, dwindling catches, low resource ownership, exposure to climate hazards and limited opportunities for livelihood diversification [3].

Following the COVID-19 outbreak in the country in March 2020, the Government of India imposed a nationwide lockdown from 23rd March to 30th May, 2020 which disrupted all productive activities including fishing and post-harvest activities, affecting the fishers, traders, processors, exporters and consumers in the value chain [4]. With the easing of lockdown restrictions by the central government, the Government of Kerala allowed the small-scale boats to operate from April 4, 2020 onwards with restrictions on the number of boats and open ~~auction~~ ~~auctions~~ at the landing centres. The Kerala Government announced a state-wide lockdown to curb the surge in ~~covid~~ COVID-19 cases from 8th to 30th May 2021 during the second wave of the pandemic. Following the lifting of ~~state-wide~~ ~~state-wide~~ lockdown, the state imposed triple lockdowns inwards based on the severity of the spread. Many of the fish landing centres remained closed during different periods due to the lockdown restrictions. The restrictions limited the fishing operations as well as marketing activities. Since most of the marine fishes are marketed through the domestic supply chain, the market disruptions along with restrictions on fishing operations affected the livelihoods of fishers.

The marine fish production in Kerala declined from an average 5.8 lakh t during 2017-19 period to a ~~meagre~~ ~~meager~~ 3.6 lakh t in 2020 which increased to 5.5 lakh t during 2021. The small-scale fishing sector in India comprises fishing units other than ~~mechanised~~ ~~mechanized~~ fishing vessels and large inboard fishing vessels [5]. The small-scale fishing units consisting of 13,868 ~~motorised~~ ~~motorized~~ and 4016 ~~non-motorised~~ ~~non-motorized~~ units operating in the marine fisheries sector of Kerala contribute nearly 30% of the fish production in the state. This sector recorded a consistent decline in fish production after 2014 and the fishers reported a drastic reduction in fish catches after the cyclonic storm Okhi which hit the coastal areas of the state in 2017. ~~Decline~~ ~~The decline~~ in catches of the major fishes targeted by the small-scale sector such as sardines, shrimps and anchovies along with reduction in fishing days due to ~~covid 19~~ and weather warnings exacerbated the woes of the small-scale fishers in Kerala. In this context an analysis was conducted in selected districts of Kerala state to study the economic impact of the pandemic on small-scale coastal fishers.

2. MATERIAL AND METHODS

2.1 Study sites or Description of the study sites

Comment [JO7]: Before this paragraph, you may have a paragraph on some studies that have examined impacts of COVID-19 on people in general and narrow down to what your study sets to do to fill a gap that has not been addressed in those studies.

Comment [JO8]: Be consistent in your use of covid-19 or COVID-19 throughout the article.

Comment [JO9]: Add something on why study economic impact or the reason for studying the economic impact. For example "to support efforts to improve resilience of small-scale fisher households" ...

Comment [JO10]: Too summarised. I suggest having subsections:
2.1 Description of the study sites
2.2 Data collection approach
2.3 Data analysis

Alappuzha, Ernakulam and Malappuram districts of Kerala were selected for the study.

Comment [JO11]: Expand a little on why sites were selected and their unique characteristics for the study you did.

2.2 Data collection approach

Data were collected from respondents operating ~~small-scale~~ motorised fishing units in the selected districts. These fishing units used ring seines, gillnets or minitrawls which primarily target ~~oil sardines~~ sardines, mackerels, anchovies, shrimps etc. The survey was administered during the major pandemic years of 2020 and 2021. Snowball sampling was adopted followed by telephonic interviews to collect information. The economic impacts of the ~~evid~~ COVID-19 pandemic on small-scale fisher households in Kerala was assessed based on the reduction in employment due to the loss of fishing days, impacts on income, consumption, and indebtedness of small-scale fisher households during and ?? pandemic years 2020 and 2021. The information on fishing days, income, and consumption during the pre-pandemic year (2019) were also collected from the respondents on a recall basis. The information on relief and support measures and alternate livelihoods during the pandemic was also collected to assess ~~the~~ economic resilience during the pandemic.

Comment [JO12]: Revise the sentence, something seems missing in it.

2.3 Data analysis

Standard statistical tools were employed for the analysis.

Comment [JO13]: Would it be possible to just mention the tools used to allow reproducibility of your research? A little elaboration of how, for what, and why each tool was used will improve your contribution to research.

3. RESULTS AND DISCUSSION

The ~~SSF~~ units in Kerala are owned and operated by traditional fishermen. The small-scale fishers continued fishing operations except during the nationwide COVID-19 lockdown in 2020 during the first wave of the pandemic, ~~state-wide~~ statewide lockdown in 2021 during the strong second wave and regional lockdowns imposed at fish landing centres during the pandemic. However, reduction in fishery resources targeted by the fishers, cyclone warnings along with covid infection among the fishers drastically reduced the fishing days during the pandemic period. Even though the fishes were marketed through fixing price at the landing centres for a shorter period of time during the nation-wide lockdown, the open auction system at the fish landing centres resumed after the lockdown period.

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3.1. General profile of respondent households

The average age of the respondent fishermen varied from 44 years in Malappuram district to 50 years in Alappuzha district. The respondents in Alappuzha and Ernakulam districts were comparatively older than the

respondents in Malappuram district. The average fishing experience of the respondents was 23 years in Malappuram district and 29 years in Alappuzha and Ernakulam districts. The educational status of the respondents revealed that 43% had high school level education followed by 29% with upper primary and 22% with primary level education (Table 1).

Table 1: Socio-demographic profile of the respondents

Particulars	Alappuzha	Ernakulam	Malappuram	Average
Age (years)	50	49	44	47
Fishing experience (years)	29	29	23	27
Educational status				Total
Primary	7	14	19	40
Upper primary	22	11	19	52
High school	28	35	15	78
Higher secondary	2	-	5	7
Graduation	1	-	2	3

3.2. Impact of the pandemic on employment and income of fishers

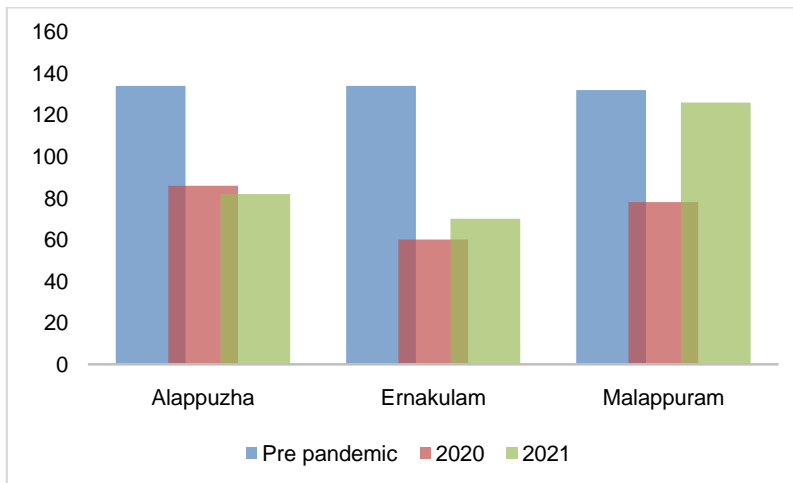
On an average, the fishers in Alappuzha district received 134 fishing days which was reduced to 84 days in 2020 (x% decline) and 82 days in 2021 (y% decline). In Ernakulam district the actual fishing days reduced from 134 days during the pre-pandemic period to 60 days in 2020 (x1% decline) and 70 days in 2021 (y1% decline). The fishers of Ernakulam district had the lowest fishing days during the pandemic years. The cyclone Tauktae which hit the coastal districts of Kerala wreaked havoc in Ernakulam district and destroyed nearly 150 houses in Chellanam fishing village. In addition, the frequent weather warnings prevented the fishers from venturing into the sea resulting in the loss of more fishing days. The pandemic affected the livelihoods and day-to-day earnings of the fishermen in Yanam, Puducherry[6]. The small-scale fishers engaged in floodplain wetland fisheries in Bihar, West Bengal and Assam reported income loss of ₹10000, ₹12500 and ₹ 4500 due to COVID 19 lock down [7].

The economic impact of COVID-19 on small-scale fishing communities in Bangladesh revealed that fishing trips were reduced by frequency and duration compared with the pre-COVID-19 period, resulting in lower income of fishers [8].

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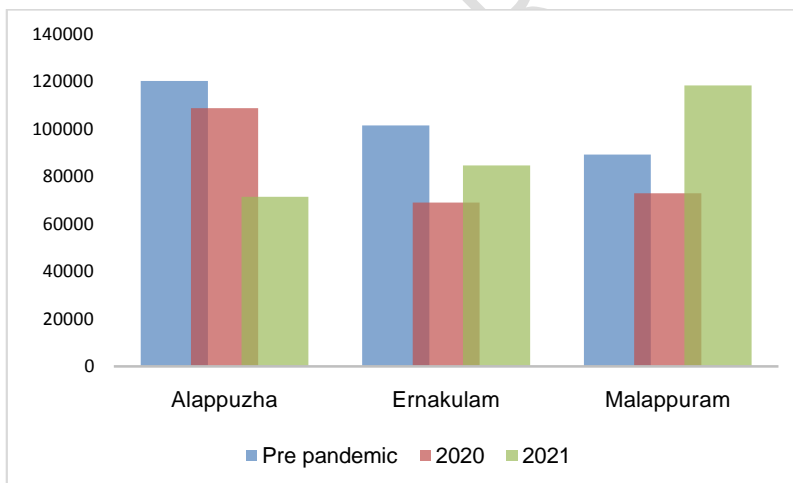
Comment [JO16]: Are these new study sites or they are sub-parts of the larger study sites. Not clear and may confuse readership. Why not resolve to report at the initial level of Alappuzha, Ernakulam and Malappuram?

Comment [JO17]: This should move to discussion on income. What you need here is some discussion on your observed reduction of number of days (an indicator of reduced employment) and cite any studies that have done so that are comparable or in contrast to what you found.



Comment [JO18]: There is no supporting reference in the text above about what this figure is telling? Describe what this figure is telling in the text above it so that readers may follow this.

Fig.1.Fishing days during pre-pandemic and pandemic years



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Fig. 2. Annual fishery income during pre-pandemic and pandemic years

The actual fishing days in 2021 were fewer for the respondents in Alappuzha district when compared to 2020 whereas in Ernakulam and Malappuram districts, the small-scale fishers had more fishing days in 2021 compared to 2020. This may be due to the fact that more stringent regulations and lockdown restrictions imposed in the state in 2020 compared to 2021. The respondents in Alappuzha district reported the lowest average wage of ₹871

per day in 2021 compared to pre-pandemic year and 2020. Even though the average wage per day was highest in Ernakulam district, the annual incomereceived by the fish workers was lowest in Ernakulam district with a drastic reduction in fishing days during the pandemic years. ADD HERE CITATION AND REFERENCES ON INCOME STUDIES DUE TO COVID-19 TO SUPPORT YOUR DISCUSSION OF THE RESULTS.

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3.3. Changes in monthly consumption expenditure of the respondent households

The fishers were forced to reduce the consumption expenditure in-onsome of the essential items or to borrow money to meet household needs during the pandemic. The reduction in expenditure was mostly reflected in reduced spending on clothes, entertainment and other expenses (Fig.3???). The fishers were forced to reduce food expenditure and reported food insecurity during the pandemic. The respondents in Ernakulam district reported a 34% reduction in consumption expenditure during the pandemic period followed by a 13% reduction in Alappuzha and an 11% reduction in Malappuram district. Food inadequacy was reportedamong the small-scale fisher households due to lockdown restrictions during the covid pandemic in Davao Gulf, Philippines [9].

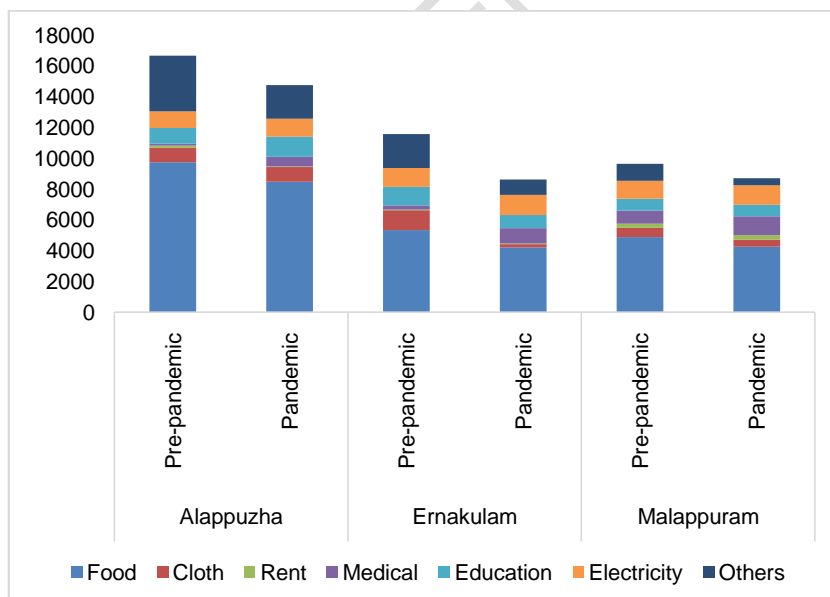


Fig. 3. Household consumption expenditure during the pre-pandemic and pandemic period

3.4. Indebtedness of the respondent households

The small-scale fisher households ~~availed~~ obtained loans for the purchase of houses, fishing ~~equipment~~ equipment, marriage or for meeting the educational needs of the family. The fisher households were forced to ~~avail~~ obtain more loans during the pandemic to meet the household needs including medical expenses during covid infection and post-covid treatments. ~~Covid-19~~ COVID-19 deepened the debt burden of small-scale fishers as most of the fishers borrowed from informal sources to meet their household needs during the pandemic.

The outstanding debt of the small-scale fisher households varied from ₹1,48,250 in Ernakulam district to ₹2,22,271 in Malappuram district. The major purposes for which the small-scale fishers availed credit included the purchase or construction of houses, marriage, education, purchase of crafts, gears or engines, medical expenses etc. More than 75% of the households in all the selected districts borrowed money to meet household expenses during the pandemic. In Alappuzha district, 85% of the respondents reported to have borrowed money to meet the household expenses followed by 81% in Ernakulam district and 77% in Malappuram district p

. Informal sources such as friends, relatives, gold loans from private money lenders and micro-finance institutions formed the major credit sources during the Covid pandemic. Add ANY DISCUSSIONS AROUND OTHER STUDIES ON INDEBTEDNESS AND HOW THEY COMPARE WITH YOUR RESULTS?

3.5. Relief and support measures and alternate livelihoods for the fisher households

The fishers received relief and support measures from the government in terms of cash transfers (x%), additional rations (y%) and food kits (z%). Cash transfer to fisher households by the government was in the form of welfare pensions (x1%), payments through savings (x2%) and relief schemes for fishers (x3%) and lump sum payments (x4%) during the pandemic. The social security pensions included old age pension, widow pension, fishermen welfare pension etc (DO YOU HAVE RESULTS TO DISPLAY IN Tables or Figures here?). The Government of Kerala has also provided free food kits consisting of essential items to all sections of the society during the pandemic from April 2020 to August 2021. All the respondent households received food kits and free ration during the pandemic. In addition, the free and subsidized rice supplied through ration shops served as a great relief to the fishers during the pandemic. However, food insecurity issues were also

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reported by many of the respondents (what percentage of respondents?). More than 50% of the respondent households in Alappuzha district received social security pensions followed by 38% in Ernakulam district.

Alternate livelihood opportunities were more for the fisher households of Alappuzha district and 85% of households reported the availability of alternate livelihoods. The women in the small-scale fisher households of Alappuzha districts were mostly employed in shrimp peeling sheds and most of the peeling sheds operated during the pandemic. The alternate livelihood options were limited for the fisher households in Malappuram district. The Government of Kerala provided a lump sum payment of ₹2,000 to the families of fishermen engaged in fishing activities, while registered fishermen were given ₹1,000. As many as 1,78,365 fishermen, who are covered under the Saving-Cum-Relief scheme, were benefitted though a lump sum payment of ₹3,000 during the pandemic.

Transfer payments to the fisher households included social security pensions, payments through the fishermen welfare fund programme, lump sum payments to households during covid etc. COVID-19 affected the livelihood security of fish workers who were hitherto suffering from catch decline, exploitation by middlemen, high fishing costs, and climate change impacts. With limited opportunities for livelihood diversification and low livelihood asset ownership, the pandemic exacerbated the already existing livelihood constraints and deepened the debt burden of SSF in the state. The covid-COVID-19 pandemic underscores the vulnerability of the small-scale fishing sector in the state to exogenous shocks and stresses. The SSF needs to be compensated for the loss of employment and there is an urgent need to create livelihood diversification opportunities to ensure the sustainability of the SSF. Livelihood diversification is a key strategy for improving the livelihoods of small-scale fisher households to cope with stress and shocks in Southeast Asian countries [10]. Livelihood diversification, intensification of business, utilization of social networks, asset sales, and mortgages were adopted as coping strategies by the Bajo fishing community to overcome the decline in fishing [11]. Government assistance through monthly emergency funds to fishermen was extremely important in complementing the source of income and covering their basic household needs [12]. Studies on the impacts of covid 19 on the fisheries sector have reported the adverse impacts on fisher's livelihoods and suggested immediate and long-term policy and action plans to recover the fishing sector from the adverse effects of the pandemic [13,14].

4. Conclusion

The covid 19 caused disproportionate impacts on different sections of the population fisher folk households. The small-scale fishers being the a

Comment [JO23]: May be there is no etc but you use this to indicate what you don't know. It would be ok to just indicate and end with what you have found and stop at that.

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marginalized sections of the society ~~was~~ ~~were~~ affected by the reduction in fishing days due to the ~~lock-down~~ ~~lockdown~~ restrictions during the ~~COVID~~ ~~COVID-19~~ pandemic together with frequent weather warnings and catch decline due to climate change affecting their economic security. The small-scale fishers were less resilient during the pandemic with reduction in fishing days, low fishery income, and low livelihood asset possession which deepened their debt burden. The relief and support measures were inadequate to compensate for the loss in fishery income and there was limited opportunity for livelihood diversification. There is an urgent need to adopt income enhancement measures through the creation of diversified or alternate livelihood strategies, and debt relief measures to enhance the resilience of small-scale fishers to external shocks and stresses.

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