



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

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Authors' contributions

This work was carried out in collaboration between both authors. Author AN designed the study performed the statistical analysis and wrote the first draft of the manuscript. Author NTM designed the study and reviewed the results of the study. Both authors read and approved the final manuscript.

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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 causing severe disruptions in fishing and marketing activities. In this context, an analysis of the socio-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. The information on access to relief and support measures and alternate livelihood sources was also collected to assess the economic security of the fisher households.

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

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Methodology: Snowball sampling was adopted followed by telephonic interviews to collect the information from the fisher households. Descriptive statistics and one-way ANOVA were used for data analysis

Results: The annual fishing days declined from 134 to 82 days in Alappuzha district (38.8% reduction) and from 134 days to 70 days in Ernakulam district(47.76% reduction). The respondents in Ernakulam district reported a 34% reduction in consumption expenditure followed by 13% in Alappuzha and 11% in Ernakulam district. More than 75% of the respondents borrowed money to meet household expenses during the pandemic. The results indicated that the COVID-19 pandemic deepened the debt burden and exacerbated the livelihood constraints of the small-scale fishers

Conclusion: The Government transfer payments and relief measures during the pandemic were inadequate. The study proposes 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.

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

1. INTRODUCTION

The 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 [3]. The small-scale fishers (SSF) represents the 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 [4].

Several studies attempted to assess the impact of the pandemic on the fisheries and aquaculture sectors. An analysis of the implications of the pandemic for small-scale fishers, including marketing and processing aspects of the sector, and coastal fishing communities based on studies conducted across the world reported complete shut-downs of some fisheries, economic effects from market disruptions, increased health risks for fishers, processors, and communities, exacerbated vulnerabilities to other social and environmental stressors, and increased Illegal, Unreported and Unregulated fishing [5]. A study on the early impacts of COVID-19 on Peruvian fisheries and mariculture analyzed the differential impacts of the pandemic on small-scale fishers, workers, and industrial enterprises during the first wave of the pandemic

[6]. The study on the impacts of the COVID-19 pandemic on small-scale fisheries in Thailand made a preliminary assessment of the pandemic on the livelihoods of small-scale fishers and their adaptations to mitigate such impacts. The study made a preliminary assessment of the fish supply demand, fishing activities, processing, trade, and gender during the first wave of the pandemic in 2020 and there was no detailed analysis of the socio-economic impact [7]. Another study conducted in Trang Province, Thailand on perceived impacts of the COVID-19 outbreak on the small-scale coastal fishing communities focussed on five aspects of the impacts and coping strategies, namely, natural, financial, social, human, and physical capitals [8].

In India, the study on the stakeholders' perception of the impact of COVID-19 lockdown in the fisheries sector focussed primarily on how the lockdown restrictions affected the fishery business, and the socio-economic impacts on the fishers were not covered in the study [9]. The impact of the COVID-19 lockdown on small-scale fishers (SSF) engaged in floodplain wetland fisheries analyzed the employment and income loss to fishers of three Indian states Bihar, West Bengal, and Assam [10]. However, based on the available literature there is an information gap about the socio-economic impact of the pandemic on small-scale fishers in the marine sector in India.

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 [11]. 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 auctions at the landing centres. The Kerala Government announced a state-wide lockdown to curb the surge in COVID-19 cases from 8th to 30th May 2021 during the second wave of the pandemic. Following the lifting of state-wide lockdown, the state imposed triple lockdowns in wards 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 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 mechanized fishing vessels and large inboard fishing vessels [12]. The small-scale fishing units consisting of 13,868 motorized and 4016 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. 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 socio-economic impact of the pandemic on small-scale coastal fishers. The small-scale fishers in the marine sector are the most marginalized sections of society and assessing the socio-economic impacts during stresses and shocks will support the development of policies and programmes for improving the resilience of fisher households.

2. MATERIALS AND METHODS

2.1 Study Sites or Description of the Study Sites

The state of Kerala has a coastline of 590 km encompassing the nine coastal districts.

Alappuzha, Ernakulam and Malappuram districts were selected for the study representing the south (Alappuzha district), central (Ernakulam district), and northern (Malappuram district) regions of the state. In Alappuzha and Malappuram districts small-scale traditional fishers using small motorized fishing units dominate, whereas in Ernakulam districts mechanized fishing units also operate from the major fishing harbours besides the small-scale fishing units. The active fishermen population in the selected districts were 27,203, 13,029, and 32,718 respectively in Alappuzha, Ernakulam, and Malappuram districts in 2020 [13].

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, mackerels, anchovies, shrimps etc. Data were collected from 180 respondents consisting of 60 each from each selected district. 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 socio-economic impacts of the COVID-19 pandemic on small-scale fisher households in Kerala was assessed based on the reduction in employment, impacts on income, consumption, and indebtedness of small-scale fisher households during the pandemic years. The information on fishing days, income, and consumption during the pre-pandemic year (2019) was 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 economic resilience during the pandemic.

2.3 Data Analysis

Standard statistical tools were employed for the analysis. Averages and percentages were used for comparing the district-wise employment, income, and consumption during the pre-pandemic and pandemic years. One-way ANOVA was used to test whether there is any significant difference in fishing days between the selected districts during the pandemic.

3. RESULTS AND DISCUSSION

The small-scale fishing units in Kerala are owned and operated by traditional fishermen. The SSF

continued fishing operations except during the nationwide COVID-19 lockdown in 2020 during the first wave of the pandemic, 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 the price at the landing centres for a shorter period of time during the nation-wide lockdown, the open auction system at the fish landing centers resumed after the lockdown period.

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).

3.2 Impact of the Pandemic on Employment and Income of Fishers

On average, the fishers in Alappuzha district received 134 fishing days which was reduced to 84 days in 2020 (37.31% decline) and 82 days in 2021 (38.80% decline). In Ernakulam district, the actual fishing days reduced from 134 days during the pre-pandemic period to 60 days in 2020 (55.22% decline) and 70 days in 2021 (47.76% decline) (Fig.1) There was significant difference in fishing days($p < 0.001$) reported by the fisherfolk in the selected districts during the pandemic years. This may be due to the regional variations in lock down restrictions in different fish landing centres in the districts due to the COVID outbreak. 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. Decline in fishing days during the pandemic was reported from many parts of the world.

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

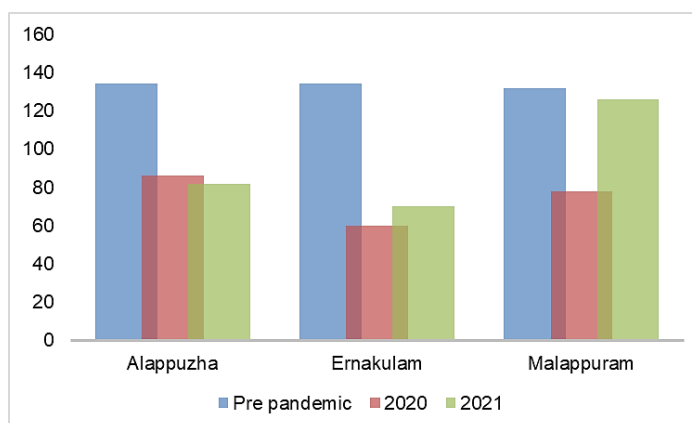


Fig. 1. Fishing days during pre-pandemic and pandemic years

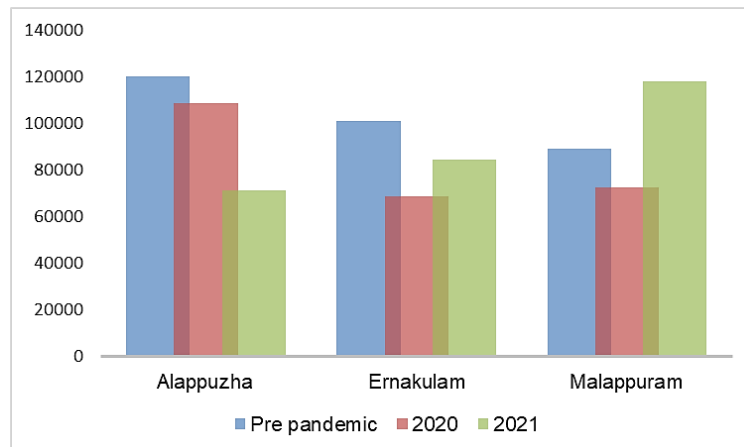


Fig. 2. Annual fishery income during pre-pandemic and pandemic years

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 were 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 income received by the fish workers was lowest in Ernakulam district with a drastic reduction in fishing days during the pandemic years. The pandemic affected the livelihoods and day-to-day earnings of the fishermen in Yanam, Puducherry [14]. 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 down-lockdown [10]. The economic impact of COVID-19 on small-scale fishing communities in Bangladesh revealed a reduction in the frequency and duration of fishing trips compared with the pre-COVID-19 period, resulting in lower income for fishers [15]. The small-scale fishers in the Philippines and Indonesia also reported reduced income from fishing operations during the COVID-19 pandemic [16, 17].

3.3 Changes in Monthly Consumption Expenditure of the Respondent Households

The fishers were forced to reduce the consumption expenditure on some 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 reported among the small-scale fisher households due to lockdown restrictions during the COVID pandemic in Davao Gulf, Philippines [16].

3.4 Indebtedness of the Respondent Households

The small-scale fisher households obtained loans for the purchase of houses, fishing equipment, marriage or for meeting the educational needs of the family. The fisher households were forced to obtain more loans during the pandemic to meet the household needs including medical expenses during covid infection and post-covid treatments. 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 (Table 2). 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. Gold loans from private money lenders constituted 68% of the total borrowings during the pandemic. Only 14% of the respondents were able to obtain credit from formal sources. The fisherfolk preferred credit from informal sources as it was easier for them to obtain loans from people who are known to them without collateral security, less formalities in transactions, and flexible repayment options.

Similar findings were reported from Trang province of Thailand during the COVID pandemic. The small-scale fishers used up all their savings during the lockdown and 73.7% reported going into debt. They borrowed money from relatives or family members (23.7%), informal money lenders (21%), banks (18.4%), or neighbours (10.5%) as they could not continue their livelihoods with their severely reduced income [8].

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 additional rations and food kits. The fisher households were also benefitted through the

cash transfer programmes by the government in the form of welfare pensions (37.22%), payments through savings and relief schemes for fishers (80.56%) and lump sum payments (31.67%) during the pandemic. The social security pensions included old age pension, widow pension, fishermen welfare pension More than 50% of the respondent households in Alappuzha district received social security pensions followed by 38% in Ernakulam 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 through a lump sum payment of ₹3,000 during the pandemic. The Government of Kerala 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 reported by many of the respondents (56.67%).

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.

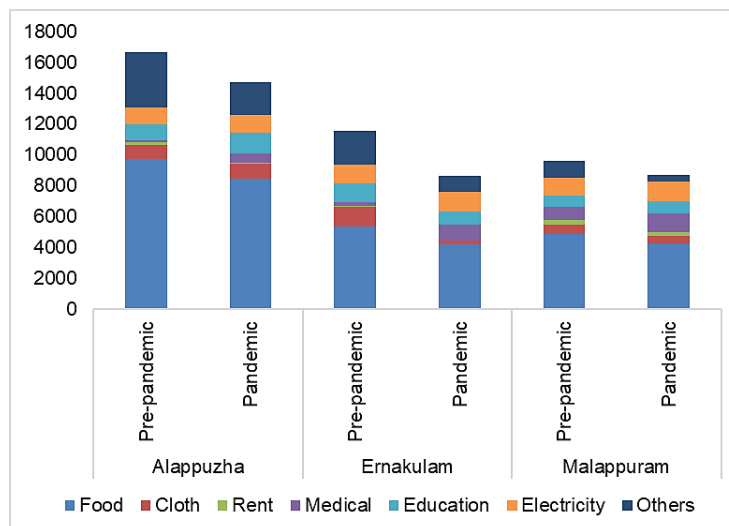


Fig. 3. Household consumption expenditure during the pre-pandemic and pandemic period

Table 2. Indebtedness of small-scale fisher households

District	Outstanding debt (₹)	Households borrowed money during the pandemic (%)
Alappuzha	203559	85
Ernakulam	148250	81
Malappuram	222271	77

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-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 [17]. 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 [18]. Government assistance through monthly emergency funds to fishermen was extremely important in complementing the source of income and covering their basic household needs [5]. Studies on the impacts of COVID19 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 [19,20].

4. CONCLUSION

The COVID-19 caused disproportionate impacts on different sections of the fisher households. The small-scale fishers being a marginalized section of the society were affected by the reduction in fishing days due to the lockdown restrictions during the 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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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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