

# The impact of Covid-19 pandemic on artisanal fishery sector, and Coastal fishing communities in The Gambia

*El impacto de la pandemia de Covid-19 en el sector de la pesca artesanal y en las comunidades pesqueras costeras de Gambia*

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## ABSTRACT

The Objective of the article is to comprehend the impact of the Covid-19 pandemic on the artisanal fishery sector, and Coastal fishing communities in The Gambia. We carry out qualitative research with a structural questionnaire in which we interviewed selected fish men in the coastal area in the Gambia. The study used a simple random sampling technique, in which from the target population of 6000 people, we selected 384 people randomly as our sample size using the "Yaro Yamane Statistical Formula". The statistical methods used in this study are descriptive statistics, correlation, and Ordinary Least Square (OLS) Method for the analysis. There is a weak negative correlation between the revenue generated from fishing and the management level (correlation coefficient of -0.3561). Despite the covid-19 pandemic, there exists a strong positive correlation between demand for the fish product in the domestic market and revenue generated from fishing (correlation coefficient of 0.7843). Therefore, policy-makers should look at the management of fishing to improve it and try to establish a good local market for fishermen to sell their fish products.

**Keywords:** The Gambia; Social and economic; Management; SSF; "Tanji"; artisanal fishery sector; COVID-19 pandemic.

## RESUMEN

El objetivo del artículo es comprender el impacto de la pandemia de Covid-19 en el sector de la pesca artesanal y las comunidades pesqueras costeras de Gambia. Se realizó una investigación cualitativa con un cuestionario estructural en el que se entrevistó a hombres de la pesca seleccionados en la zona costera de Gambia. El estudio utilizó una técnica de muestreo aleatorio simple, en la que, de la población objetivo de 6000 personas, seleccionamos 384 personas al azar como tamaño de nuestra muestra utilizando la "Fórmula estadística de Yaro Yamane". Los métodos estadísticos utilizados en este estudio son la estadística descriptiva, la correlación y el método de mínimos cuadrados ordinarios (MCO) para el análisis. Existe una débil correlación negativa entre los ingresos generados por la pesca y el nivel de gestión (coeficiente de correlación de -0,3561). A pesar de la pandemia de covid-19, existe una fuerte correlación positiva entre la demanda del producto pesquero en el mercado nacional y los ingresos generados por la pesca (coeficiente de correlación de 0,7843). Por lo tanto, los responsables políticos deberían estudiar la gestión de la pesca para mejorarla e intentar establecer un buen mercado local para que los pescadores vendan sus productos pesqueros.

**Palabras clave:** Gambia; Social y económico; Gestión; SSF; "Tanji"; sector de la pesca artesanal, pandemia de COVID-19.



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## 1. Introduction

The Republic of the Gambia is located in West Africa and is the smallest country. Due to its smallest size, the Gambia has a total land area of 11,420 sq. km and out of this figure, 1,300 sq. km is water and 80km coastline and fishing zone of 200 nautical miles. Fish production is an important aspect of the livelihoods (Passfield, 1997, Dalzell, Adams, and Polunin, 1996) and a source of income (Robert Gillett and Chris Lightfoot (2001), consumption (Zann, 1987), and Asian Development Bank (2001) and livelihoods (Asian Development Bank, (2001) and as a source of export (UNCTAD 2014). Small scale fishing in the Gambia is characteristically rooted in many local households and communities in the coastal regions of the country such as Tanji, and Guguru. Sustainable development goal (SDG) no. 14 needs to recognize the importance of small-scale artisanal fishers to marine resources and the market (Nations, 2018). According to the joint research conducted by the FAO and Gambia Bureau of Statistics (GBS), around 30,000 Gambians are employed in the aquaculture and fisheries sector. The Fisheries Department estimates that the sector contributed about 5% to GDP in 2014-2015, while artisanal activity accounted for 90% of all aquaculture and fisheries outputs in 2013-2014. According to the National Environment Agency (NEA) of The Gambia, the country is classified among the lowland countries, putting more than 2 million of its population at risk. Even though COVID-19 does not affect fish directly somehow, the fish sector is still subject to indirect impacts of the pandemic through changing consumer demands, market access, or logistical problems related to transportation and border restrictions. This will in turn have a damaging effect on fishers and fish farmers' livelihoods, as well as on food security, the standard of living, and nutrition for populations that rely heavily on fish for consumption and investment. (Horemans B., 1996) said fisheries contribute a relatively small proportion of GDP in the Gambia, significant importance is attached to the development of the sector by the national authorities.

Further, they continue to say it provides indeed valuable fish supplies for domestic consumption, direct and indirect employment for about 20,000 people, and foreign exchange earnings through exports. In The Gambia, like in most countries of the region, fish is the cheapest source of animal protein. According to FAO, 2015 and State World Fish. Aquac. 2020, 2020, small-scale fishing communities are also entitled to participate in decision-making so that their voice should be heard because small-scale fishing contributing to food security, sustainable fisheries and poverty, and hunger alleviation. According to the UN Declaration on the rights of peasants, 2019 further clarifies small-scale fishing and applies to international human rights. This was a harbinger of massive and life-altering changes that were about to unfold in small-scale fisheries (SSF) and coastal fishing communities around the world. Since COVID-19 was declared a pandemic by the World Health Organization (WHO, 2020) on March 11th, 2020 global fishing activity has dropped approximately 10%. According to the FAO, 2015, globally, there are an estimated 32 million directly employed as small-scale fishers (SSF), an additional 76 million employed in post-harvest jobs, and 81% of the catch is used for local human consumption. The International Collective in Support of Fish-workers (ICSF) has recently launched an online platform dedicated to the specific impact of the COVID-19 pandemic on fisheries and fishing communities (ILO 2020). In West Africa in particular, COVID-19 could not have come at a worse time for some of the most vulnerable communities that are in some cases already confronted with hunger or conflict (FAO, 2020).

The pandemic is in fact also expected to deepen gender inequalities across the whole seafood sector. In the wake of these socioeconomically precarious situations, the African Confederation of Professional Organizations of Artisanal Fisheries (CAOPA) has recently called upon partners to ensure measures are taken to help artisanal fisheries pursue their activities during the crisis. Across the World, the outbreak of COVID-19 and the resultant total lockdown has greatly affected the livelihoods of fishing communities across India (Mohan 2020). The total lockdown may help arrest the spread of coronavirus; however, quick, and effective intervention is required for fishers to minimize the disruptive effect on the livelihoods of vulnerable populations particularly on food systems, storage, and market chains, both locally and regionally (Mohan 2020). Fisheries in India is an important sector of food and nutritional security (Mohan 2020). Consequently, millions of people will suffer increasing inequality and poverty. Small-scale fishing in the Gambia ranges from traditional coastal and rural-based fishing, which is primarily for subsistence purposes. Women play important roles in the operation of the small-scale fishing sector in the Gambia as they are mainly the sources of employment in this sector in the Gambia. In this COVID-19 pandemic, the small-scale fishing sector is particularly vulnerable, and that vulnerability affects the employment, demand for fishing, supply for fishing, the price for fishing, the research for fishing, and the control, monitoring, and surveillance for fishing in the Gambia. The domestic market suffered fishing distribution due to most of the fishermen in the Gambia are foreigners and due to the COVID-19 outbreak and due to government laws on locked down principle, this sector is vulnerable to low catch and that affects the communities that depend on it for consumption, and as sources of investment especially the coastal communities and beyond.

The global objective is to understand the sustainable development and management of the artisanal fisheries for the maximum social and economic benefit of their fishing communities in terms of employment, demand for fisheries product, the price for fisheries products, supply for fisheries products, and as well as the management level such as fisheries management, fisheries monitoring, control, and surveillance (MCS) and fisheries research.

The specific objectives are.

To identify the social-economic impact of fisheries at the time of the COVID-19 outbreak in the coastal Village of “Tanji” in The Gambia.

To identify the management level impact of fisheries during the COVID-19 pandemic in the coastal Village of “Tanji” in The Gambia.

## 2. Material and Methods

The data was collected by employing simple random sampling procedure through a structured questionnaire. The questionnaire was pre-tested before the actual survey and then it was delivered verbally to most of the participant due to the prevalence of extensive illiteracy among the fish men in the study area. A total of 384 households were covered in this study. All respondents were taken from one coastal fishing center due to its large size known for fishing in The Gambia. Due to the extended family system that depend on fish for survival both consumption, paying education for their children,

health care expenses and employment and due to current transition in the in covid-19 pandemic, we consider those working in the coastal fishing area as those people who work and share the income with their family and love ones. The survey covered revenue generated variables, covid-19 pandemic, and management of fishing variables that affect their livelihoods during the covid-19 pandemic. The important socio-economic and management variables include Employment in capturing fish, Employment in post-harvest activities, gender, Demand for the fish product at the domestic market, Demand for fish product in the export market, Price for capturing fisheries, Supply for the fish product at the domestic market, Supply for the fish product at import market. We also inquire about the sources of management, whether the management is from governmental level or private entity. Furthermore, they were asked about the causes of low catch. Several factors were identified as potentially responsible for low catch and the respondents were ask about them, like monitoring, control and surveillance, and fishing research. In developing world people generally try to get enough fish for their family and to sell at domestic market and they do not care about the environmental damages it causes in their livelihoods.

### 2.1. Sample section methods and sample size

Sampling is an essential tool for research. Specific sampling techniques are used for specific research problems, because one technique may not be appropriate for all research problems. Similarly, if the sample size is unsuitable it may lead to erroneous conclusions. The simple random probability sampling options will be used in this study. Simple random sampling as the name implies, simple random sampling is the most straightforward sample technique within probability sampling methods. A simple random sample involves the random selection of households, communities, wards, etc. from a complete list of all households, communities, wards etc. within the entire target population (e.g., sampling frame). One of the most exceptional features of this technique is that each member of the population has an equal chance of being selected (Wimmer & Dominick, 2006). Simple random sampling has a statistical advantage over other sampling approaches and requires a small sample size. Nevertheless, an in-depth population list is mandatory, and the cost of visiting geographically dispersed households, communities, villages, or towns may be high. The most popular tactic to simple random sampling is the use of a table that contains a random number. In this method the researcher randomly picks the starting by going up, down, left, and right on the table or random numbers, or even randomly throughout the table (Wimmer & Dominick, 2006). This is how we will conduct the simple random sample from The RAND FUNCTION OF EXCEL. The sample size of 384 fishermen and workers should be selected from sample frame of 400 workers. We will assign each household a number from 1 to 400 (the total target number of workers). The random number generator –THE RAND FUNCTION is used to select 384 workers. The selected village (“Tanji”) will then map, so that we can have access in the Gambia. Finally, given the proximity of workers to one another within the coastal fishing village, data collection teams can walk between selected workers. The teams consist of 10 peoples and 5 data coders coded the data. Stata 16 core was used to manage the data (see detail explanation Tong A, Sainsbury P, Craig J., 2007).

This is how we calculated the sample size by using the Yaro Yamane Statistical Formula for finding sample size of a finite population. This method is only applicable when the numerical strength of the population is known. The formula is:

$$n = N / [1 + N (e)^2]$$

Where, n = the sample size

N = the finite population or total number of fishing workers selected

e = the level of significance or limit of tolerable error (it could be 0.01, 0.05. or 0.10)

1 = unit or a constant

$$n = \frac{400}{[1 + 400(0.01)^2]} = \frac{400}{1.04} = 384 \text{ workers to be survey}$$

Note: We can see from the result above that the sample size is 384 from the total target population of 400 which is the lower number of responses from the respondents to maintain a 99% confident interval.

#### Statistical methods

To analysis the impacts of Social-economic and management of fisheries in the Gambia during COVID-19 pandemic and other exogenous variables nexus, the study adopts the ordinary least square (OLS) method as follows:

$$Y_{it} = \beta_0 + \sum_{i=1}^{10} \beta_{it}X_{it} + U_{it} \dots \dots (1)$$

The model can be log or without log dependent on the relationship between the variables under study, where  $Y_{it}$  can represent a social-economic situation of fisheries during the COVID-19 pandemic, or it can also be the management level of fisheries during the same pandemic. The  $\beta_0$  is the intercept term,  $\beta_{it}$  is the coefficients at individual i and time t. Time periods take place from November 2<sup>nd</sup>, 2020, to November 20<sup>th</sup>, 2021. Subscripts i stand for the independent variables like F1=Employment in capturing fish, F2=Employment in post-harvest activities, F3=Demand for the fish product at the domestic market, F4= Demand for fish product in the export market, F5=Price for capturing fisheries, F6=Supply for the fish product at the domestic market, F7=Supply for the fish product at import market, F8=Management of shared on fish stocks, F9=Monitoring, control and surveillance of fishing activities, and F10=Research on fish stocks. We expected a negative sign between the social-economic situation of fish during the COVID-19 pandemic and the management level of fishing during the same period in the Gambia. We also expected optimistic results between social-economic on fishing during pandemic and F1 to F7. In the same vein, we also expected a strong positive sign between management level and F8 to F10.

### 3. Data and Descriptive Statistic

The survey was carried out in “Tanji”, a coastal village in the Gambia, and the sample size was 384 respondents. Descriptive statistics use in this study.

Table 1. Descriptive Statistic.

Variables	No. of observation	Mean	Standard Deviation
F1	384	1.4737	0.8412
F2	384	3.9474	0.2294
F3	384	2.2632	0.9912
F4	384	2.2632	0.3234
F5	384	3.8889	0.5015
F6	384	2.8421	0.6306
F7	384	3.9474	0.2294
SE	384	20.9474	1.4710
F8	384	1.0526	0.2294
F9	384	1.8421	3.7463
F10	384	0.4737	0.5130
ML	384	3.3684	0.5973

Source: Own Evaluation from survey data.

Out of 100 percent, approximately 68.42 percent of the respondents are male, and 31.58 percent of the respondents are female. All of them question the impacts of artisanal fishing in their communities and in their lives during the COVID-19 pandemic. The socioeconomic indicators have the highest mean averaging to 20.94(Std=1.471), while the management level indicators have a mean of 3.368(Std=0.597). For most families and individual households as well as the communities, their social and economic situation was increased due to the sustainability the fishing helps them on the pressing issues such as providing student school fees, health care expenditure, food security from fish consumption. Women engaged in fish selling and commercialization will add welfare to their families in terms of livelihoods and food security. Fishing also helps to improve employment opportunities for women in general and men in particular. Therefore, there are lots of problems associated with the management level of fishing in the Gambia due to lack of monitoring, surveillance, and control of illegal fishing, which is affecting both the revenue from fishing and polluting the environment. The relationship between social and economic indicators and management level indicators of fisheries is negative (correlation coefficient of -0.3311). As we increase 100 percent on social and economic indicators, the management level indicators are reduced by 33.11 percent. This is of course is attributed to illegal fishing operations in the Gambia, which is due to corruption and bribery from the fishing sector or government per se, the study confirmed from the data. This is back by the statistics because the management indicators such as research on fishing, management of fishing, and monitoring, control, and surveillance are all found to have a negative effect on social and economic indicators of fishing in the Gambia. We also found out that the demand for a fish product in the domestic market increases the social and economic situation in Gambia (correlation coefficient is 0.7843). In the social and economic situation, we mean livelihoods, food security, food consumption, revenue, and sustainability. As the demand for fishing rises at the domestic market or local market, the social economics situation increases by 78.43 percent. We do consider both the supply and price here.

Furthermore, as engaging in fish catch increases both the domestic and international or export markets benefit by consumption and commercialization. Therefore, there is a positive correlation between supply for fish products at the domestic market and supply for a fish product at the import market (correlation coefficient of 0.6860). Employment in capturing fish and supply of fish product at the domestic market is negative (correlation coefficient of -0.7538). This is off course due to the low level of Gambians' engaging in the fishing industry and most Gambians see fishing jobs as foreign jobs and foreigners dominated the fishing sector in the Gambia. Some of the negative connotations in the Gambian's society are most want white color jobs or sit and do "attaya" or wait for their parents to provide for them or wait for their peoples to take them abroad. These are just a few. The management level and management of shared fish stocks have positive impacts on each other (correlation coefficient of 0.2801). This is attributed to the fishing sector maybe train their staff to engage in monitoring, control, and surveillance, illegal fishing effects, and this, in turn, helps the management level of the fishing industry to have an optimistic impact on society. The Gambian's authority does not support the fishing industry and therefore the research on the fish stock has a negative effect on social and economic indicators (correlation coefficients of -0.1539). Management level indicators and monitoring, control, and surveillance have a positive relationship. Management level indicators and research on fish stocks are also positive. Social and economic indicators and prices for capturing fish are also positive. The social-economic indicators and MCS are negative.

## 4. Results interpretation

### 4.1. Social and economics

The results in the tables below indicated that in the Gambia, fishing contributes to the social and economic development of the peoples in their respective households, communities, and regions and therefore is a source of consumption and provides employment opportunities for people's especially women. The result revealed that demand for a fish product at the domestic market is a positive significant impact on the social-economic situation of the people in the Gambia. It is significant at 1 percent level of alpha and therefore 1 unit increase in the demand for the fish product at the domestic market, the social and economic situation rises by 0.963 percent. These small changes may be attributed to less youth engagement in the fishing sector as well as the government also lack monitoring, surveillance, and control in the fishing industry. The price for capturing fisheries has a significant positive effect on the social-economic indicators of fishing in the Gambia at a 99.9 percent significance level. The demand for fish products in the export market is also a significant positive effect on social economic indicators of fishing in the Gambia. Employment in the post-harvest activities is not significant but has positive signs. Both the supply of fish products at the domestic and the supply at the import market are not statistically significant but have positive signs. The f-statistic of p-value at 0.0001 and R-squared of 97.8 percent, indicated the model is good for the data.

Table 2. Estimating Regression results, the dept. variable SE.

Variable Name	Coefficient	Std.err	t-sta.	P> t
F2	1.504	0.734	1.11	0.0000***
F3	0.963	0.182	6.53	0.0000***
F4	1.222	0.469	2.93	0.014***
F5	0.988	0.315	3.77	0.003***
F6	1.3997	0.332	0.00	0.0000***
F7	1	0.839	1.19	0.259
Intercept	2.5	4.301	0.58	0.573***

Source: Authors’ own evaluation using Survey data set.

### 4.2. Management Level

The study further revealed that monitoring, control, and surveillance of fishing activities and research on fish stocks is a highly significant positive effect on the management level indicators in the Gambia. As 100 percent increases in the research on fish stocks and monitoring, control, and surveillance of fishing activities respectively, the management level of fishing will rise by 90.49 percent and 104.07 percent. This of course brings stakeholders that are engaged in the fishing industry especially the ministry of natural resources, environment, and fishing to provide training for their staff to continue monitoring and control the fishing industry so as not to be manipulated by foreigners and investors especially Chinese investors in the coastal fishing industry in The Gambia. The f-statistics probability value of 0.0000 and r-squared of 86.05 percent indicated that the model is good.

Table 3. Estimating Regression results, the dept. variable ML.

Variable Name	Coefficient	Std.err	t-sta.	P> t
F9	1.041	0.151	6.89	0.000***
F10	0.905	0.110	8.21	0.000***
Intercept	1.023	0.297	3.45	0.003**

Source: Authors’ own evaluation using Survey data set.

### 4.3. Regressed Social-Economic against Management Levels

As poor management affect the fishing sector in the Gambia, the result also confirmed that management level indicators have an insignificant negative effect on social and economic indicators of fishing in the Gambia. That means that as we increase management indicators by 10 percent, social-economic indicators decline by 8.77 percent.

Table 4. Estimating Regression results, the dept. variable SE.

Variable Name	Coefficient	Std.err	t-sta.	P> t
ML	-0.877	0.558	-1.57	0.135
Intercept	23.902	1.908	12.53	0.000***

Source: Authors’ own evaluation using Survey data set.

**4.4. The Natural Logarithm of Social and Economics and the Natural Logarithm of Management level**

Though, we also applied the natural logarithm of the variables to see their rate of change. The result revealed that changing employment in capturing fish, demand for fish at the domestic market, price of fish at local market and supply of fish at a local market and post-harvest activities of fishing in the coastal areas are highly statistically significant positive impact on the growth rate of social and economic indicators of fishing in the Gambia. The elasticity and the marginal propensity of changing in the employment of capturing fishing on changing in the social-economic indicators are significant and positive. As 1 percent increases in a change in F1-F7, there are increases in a change of social and economic indicators of fishing in the Gambia, the study found. The f-stat value of 0.0000 is highly significant and the r-squared is 0.9991, which indicated that the model fit with the data. In addition, changes in monitoring, control, and surveillance have an optimistic positive impact on the change in management level indicators, the study concluded.

Table 5. Estimating Regression results, the dept. variable LnSE.

Variable Name	Coefficient	Std.err	t-sta.	P> t
F11	0.075	0.002	30.85	0.000***
F21	0.245	0.011	21.39	0.000***
F31	0.086	0.002	53.19	0000***
F41	0.160	0.008	20.40	0000***
F51	0.086	0.003	31.72	0000***
F61	0.075	0.004	20.20	0000***
F71	0.178	0.014	13.09	0000***
Intercept	2.010	0.025	80.52	0000***

Source: Authors’ own evaluation using Survey data set.

Table 6. Estimating Regression results, the dept. variable LnML.

Variable Name	Coefficient	Std.err	t-sta.	P> t
F91	0.381	0.188	2.03	0.074*
Intercept term	2.325	1.640	1.54	0.158

Source: Authors’ own evaluation using Survey data set.

**5. Discussion of the results**

The results indicated that fishing contributes to social and economic development in The Gambia. Due to the pandemic, the price of fish in the Gambia is escalated because due to lower supply and higher demand in the domestic market. This is confirmed by IMF, 2020, which stated that international travel and domestic travel have been restricted, in that national economies have taken a major hit and unemployment numbers have become higher, and with dire forecasts that the economic effects could be as bad as the Great Depression. Hit on economic effects from market interruptions has further impacted small-scale fishers’ ability to pursue their livelihoods through reduced demand and attendant collapse of prices (Bennett et al., 2020; Ceesay, 2021; E.K. Ceesay, 2021 and Ceesay, 2020).

Cámara and Santero-Sánchez, 2019, wrote on Economic, Social, and Environmental Impact of a Sustainable Fisheries Model in Spain and they revealed that the economic impact throughout the period of ten years is quantified as an increase in total production of approximately 4000 million euros and in that revenue drives will increase, the net creation of more than 60,100 jobs and that will reduce the level of unemployment, and a reduction in greenhouse gas emissions equivalent to 412,297 tons of CO<sub>2</sub> and that causes positive environment sustainable, free of pollution inland, river and air. Our results consistent with the above finding also revealed that fishing is the source of employment especially for women and has significant positive effects on the social-economic status, and employment in capturing fish is also an important and positive effect on the social and economic indicator of fishing in the Gambia, the study noted. Cámara and Santero-Sánchez, 2019 also confirmed that 35.3 percent employed in the fishing sector are women in Spain. Another study also confirmed the role of women and according to (Harper, 2013), confirmed that in the pacific, women account for 56 percent of annual small-scale catches and resulting in an economic impact of 363 million dollars in revenue.FAO,2014 also confirmed the role of women in the fisheries sector before and after the fish are hauled out of the water or catches or post-harvest. In addition, half of all the people in the world involved in fishing and aquaculture in some respects are women (FAO, 2015a). This is due to invisible barriers and discrimination (FAO, 2015b), especially in developing countries. This is due to the vulnerability of women to be employed in low-paid jobs such as the fishing industry.

Our study also revealed confirmed that the employment in capturing fish, the demand for fish at domestic market and export market, the price of fish at the domestic market, the supply for fish at domestic and import market have positive significant impacts on social and economic status in the Gambia. These are confirmed in the following study; 1) COVID-19 occurred during the Chinese New Year, demand for luxury seafood declined and markets collapsed for Canadian and American lobsters, Australian crayfish, Vietnamese shrimp, and many other fisheries (Tester 2020) Export-oriented SSF has faced a vast reduction in demand (particularly from Asia, the United States, and Europe), port closures, loss of access to cold storage, and cessation of shipping and air freight (Orlowski 2020). In our results management of fish stocks, research on fishing activities and monitoring, control, and surveillance had an important positive impact on management level indicator of fishing in the Gambia.

Our finding revealed that fish management by the authorities is very poor, and the COVID-19 pandemic made it even worst and therefore we found out that the management level of fishing in the Gambia negative insignificant effect on a social and economic indicator of fishing in the Gambia. This has the following implication according to the following study: 1) Access to health services in rural fishing communities is difficult even under normal circumstances (Orlowski 2020), and thus these locations likely have a harder time accessing testing, treatments, and sanitation supplies needed to adequately address COVID-19 spread and infection. There are also likely reverberating impacts on the marine environment. Decreased human observer coverage and lapses in monitoring and enforcement may be leading to increased occurrence of Illegal, Unreported, and Unregulated (IUU) fishing and incursions into areas used by SSF. In the Gambia for example, there are reports of heightened illegal fishing activity by foreign vessels especially the EU and China, as government priorities have shifted toward pandemic control, which could have direct impacts on fish stocks and indirect impacts

on SSF (Minahal et al., 2020). Furthermore, in many places in West Africa are highly dependent on tourism, declines in global travel or travel restriction will have devastating impacts on the livelihoods and economics and likely lead to increased pressure on local resources to meet food and livelihood needs (Hoffman 2020 and Ebrima K. Ceesay (2020).

## 6. Limitation of the study for future research

The limitation of this study was due to smallest sample size of (n=19), which is attributed to the fact that COVID-19 pandemic increases restrictions, transport limitation and lockdown. The respondents that answered the questionnaire are smaller and most of the foreigners are afraid due to fear of the authority-government. The sample size will affect the data precision and confidence interval and margin of errors. In that, the variance and obviously the standard deviation will be smaller, and the data will not 100 percent normal due to skew to the left or right, which is due to smaller sample size, the skew will be steeper somehow or flatter in some-way. Another limitation of the study was due to the fact one of the respondent's does not understand the monitoring, control, and surveillance and that was left unanswered. In that case, bribery and corruption should also be looked at in the future. They are parts and parcels of management level indicators of fishing in the Gambia and this study left them out. They may be key variables that affect the socio-economic advancement in the fishing sector as well as sustainable fishing and commercialization of fishing in the Gambia. The issue of heterogeneity of the variables appeared such as the price of capturing fish in November 2020 due to the COVID-19 pandemic may change after the pandemic due to removal of lockdown and other measures to cope with the COVID-19 pandemics. Therefore, the quantity, the price, the distance, the type of fish caught, the demand and the supply of fish, export, import, the transport, and market, the migrated nature of fish, the types of water, the weather situations, the climate change, and overall environment, all affect the livelihoods, management, and socioeconomic development of fishing in the Gambia. Some of those variables are part of this research and most are not part of this research. The management level such as control, monitoring, planning, directing, and emergency, and the like all affected due to the pandemic, the study noted, and the future research can portray on them as well. To add to that, the management level can also look at illegal fishing, poor surveillance of fisheries resource in the high sea, the unsustainable number of catches fish, high cost of energy needed for processing fish, commercial fishing license to operate or not, Chinese damage fishing land site and declining landed. Future research can also look at climate change and environmental problems that affect the fishing sector in the Gambia and how the standard of living and livelihoods and welfare (the consumption and the income per capita) are affected. The future researchers' can also put account the skills they use to catch fish and their family and religious background and their likely impact they will remain in the fishing sector or not for the social and economic advancement of the people of the Gambia.

## 7. Conclusion and Policy recommendation

The fishing sector plays an important role in developed and developing nations by directly and indirectly involving employing numerous peoples, providing income and food, and defining the cultural identity of many coastal communities and contributing to keeping recreational facilities alive

in particular and helping households especially women by improving their livelihoods and remove them from poverty, hunger and malnutrition. Due to the COVID-19 pandemic, we are experienced and witnessing jobs loss and income loss, land dispute, married dispute, deteriorating human health due to lockdown and social distances, environmental problem, loss of social capital, food insecurity, demand and supply of fish reduces, research, social, economic and management of fishing halted. As results generated, employment in capturing fish, employment in post-harvest activities, price, and supply and demand for fishing had an important significant positive effect on the socioeconomic of fishing in the Gambia. The policymakers should look at the following and make the change on them such as the monitoring, control, and surveillance of fish in the Gambian's river, the poverty level of those engaging in fishing and fishing communities, environment and management level of fishing, add value chain and cool store in all fishing areas in The Gambia, regulate the price of fishing in the Gambia, look at the export and import of fishing in and out of the Gambia, provide skill training for youth and women engaging in fishing, and provide materials to make fish harvest easier, the study recommended to policymakers both government and non-government institutions.

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