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Comparative Analysis of Consumption Expenditure and Income Nexus before and after Pandemic: Evidence from a Particular Area of Bangladesh

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Abstract

By April 2023 around 762 million confirmed cases and over 6.8 million deaths have been reported globally due to COVID-19 (*WHO*). Huge economic loss took place due to the movement restrictions of production materials and workers. Bangladesh's GDP growth sharply declines to 6.93 percent in FY20 from a record high of 7.88 percent growth in FY19 (*WDI, World Bank*). Also due to factors like month-long lockdowns, restricted movements, sudden job cuts, the income of people decreased especially for those who belong to informal sectors like day laborers, rickshaw pullers, etc. This decline in income and the uncertainty of working opportunities also impact peoples' consumption behavior. One upazila has been selected from Bhola district i.e. Daulatkhan, a coastal area where majority of the population is involved in informal sectors. Conducting a primary survey, this paper aims to find out changes in income-consumption pattern before and after pandemic. Using Keynes consumption function, different MPC has been found for different periods, it became even worse among different professions as well. Thus this research suggests to take need base policies instead of a generic one to make vulnerable population's life secure. Necessary policy recommendation has been proposed along with opening a new dimension of future research.

Keywords

Consumption, Income, COVID-19, Keynes Consumption Function, Coastal Area, Bangladesh

1. Introduction

Consumption is one of the foremost concepts not only at household but also in

economic intensity as it helps us understand the pattern of the household and its members. Household consumption can simply be defined as the spending of income to meet their requirements and intentions where all types of goods (durable, nondurable) derive under the classification of household consumption. Consumption is the main component of GDP and while planning fiscal policies, the policymakers consider consumption expenditure and analyze how consumption reacts to the fluctuation of income. According to the definition in Macroeconomics, aggregate consumption is defined as the planned expenses which be contingent upon the stage of real income. Keynes (1936) is one of the prominent researchers who examined basic ideas concerning disposable income and consumption. In absolute income hypothesis, he emphasized how consumption is related to income by stating a few points like—consumption depends upon disposable income and dimension is positive. As a result, consumption is very much responsive to the fluctuation of income which means that consumption changes with a less amount or at best the same as the change in income. Before 1930s, most economists accentuated the relationship among consumption (or saving) and the interest rate. It is Keynes who claimed that consumption differs largely on income.

The hypothesis of Keynes can be clearly analyzed in time of any sort of external shocks to the economy. In the awake of pandemic or any sort of natural disasters, consumer behavior gets affected as well. According to Friedman (1957), in order to make APC and MPC same in long term individuals are planning to spend their permanent income purposively. As a result, MPC is influenced by unemployment, household assets, and wider insights of uncertainty. People with higher income level generally have lower MPC and vice versa for lower income group. As they are already affluent, their consumption expenditure is not much affected or sometimes not affected by additional unit of income.

COVID-19 is a special global crisis that affected all kinds of economic movements. Like any other natural disaster and war, this pandemic also has an ever-lasting impact on the economy of the globe along with countries. The pandemic has an impact on consumer behavior which also aligns with their income as COVID-19 condition affects the income level of everyone, especially people who were already living in poverty.

The main objective of the study is to analyze how consumptions vary on the basis of income with a solo focus on a particular upazila Daulat Khan, a coastal area under Bhola District. So the specific objectives are:

- To assess how consumption varies with change in income in Daulat khan upazila.
- To assess the change in livelihood of the people of coastal area both before and after pandemic.

In order to find out these objectives, the following research questions will be solved in different aspects:

- How income is related with expenditure of households considering a specific

area of Bangladesh?

• What are the policy implications for those people of coastal area based on their professional variety?

Due to time and budget constraints, this research has been done only on one upazila of one particular district of Bangladesh. In order to get more information and accurate results, further research is needed covering more areas under consideration.

This article has been structured in the following manner. First section provides background and rationale along with research objectives, questions and limitations. Section two covers the overview of literature review and finding research gap. All the information about data and variables, sample size and survey design, research tools and techniques has been described in section three. The estimation results containing descriptive and regression results have been analyzed in section four. And finally, section five concludes by proposing some relevant policy recommendations.

2. Literature Review

Lots of studies have been completed earlier to see the impact on consumption or not after any kind of disaster, pandemic, civil conflicts. One such study is conducted by Miguel and Roland (2006) where they try to see the long-term impact of the war in Vietnam on local economic conditions. They come up with the findings that though Vietnam experiences negative effect on consumption their consumption growth became faster during 1992-93 to 2002.

Many scholars are analyzing the impact of COVID-19 on income and consumption pattern of people and are still working on it. Bishop, Boulter and Rosewall (2022) explore that in Australia experienced the largest fall in GDP and household consumption in 2020 in last 60 years of its history. They also find out that household consumption is the most important factor that eruptions economic activity throughout the pandemic. Peluso et al. (2021) did an empirical study in Italy that showed sustainable products are the main where consumers expend more. Li et al. (2020) found out that impulse consumption has been increased in China during the peak season of as the pandemic. Prezotti et al. (2020) did a survey on 468 residents of Brazil and found out that alcohol and cigarette consumption has been increased by 44.9% and 53.6% respectively. Using a noisy panel data, Altonji and Siow (1987) found that measurement error is the key influential factor of income and consumption relationship.

Considering data during 2000 to 2011, Meyer and Sullivan (2013) tried to see the effect of Great Recession on income consumption pattern and found that there is an important effect on consumption and wellbeing. Xiong et al. (2021) used 454 samples from primary survey during 2020 and 2021 and reduction trend in consumption has been noticed during pandemic. Davis (2021) concluded that pandemic effected consumption significantly but policy should be

different across regions and individuals. Mankiw and Campbell (1991) argued that aggregate consumption is effected by both permanent and current income. Tanaka et al. (2021) showed that natural disasters affect negatively on expenditure of Thailand's service sector while result is same for all sectors of Philippines. Seasonal pattern has an important effect on consumption expenditure in Thailand according to Paxson (1993).

These few examples indicate that consumption behaviors have been affected significantly during pandemic along with the change in income in comparison to the pre COVID times. In this paper, the main goal is to find out how the consumption behavior of rural areas of Bangladesh has changed in COVID times along with their income condition. Because no work has been done yet focusing on a particular area people, this study aims to find out the income consumption scenario of rural people considering the pandemic situation as well. As the people of coastal area are vulnerable for some natural calamity, they are under privileged, situation becomes even worse when they are effected by a great crisis, COVID-19. This drives the urgency to work with a particular group of people in coastal area of Bangladesh, in order to know the challenges they face during pandemic and even after that.

3. Methodological Framework

3.1. Data and Variable

In this paper, primary survey based data has been used. The selected survey area is Daulatkhan upazila under Bhola district where total 34000 households are available. Two wards (ward 7 and 8) and 7 villages have been selected from 1 pourashava and 5 unions respectively (Table 1). Such selection has been made purposively by considering the accessibility of the researcher in the area and the availability of the respondents. These selected ward and unions consist of more

Table 1. Sample areas of daulat khan upazila.

Division	District	Upazila	Union/Pouroshava	Villages
			Pouroshava	**Ward**
			Daulat khan	Ward: 7 & 8
			Unions	**Villages**
			Char Khalifa	Char Khalifa Kalakopa
Barisal	Bhola	Daulat khan	Char Pata	Chor Lamchipata
			South Joy Nagar	South Joy Nagar
			Soyedpur	Boro Dholi
				Char Shuvi
			Vobanipur	Vobanipur

Source: Author's calculations.

households compared to others. Due to time and budget constraints, the study goes for sample data collection. Surveys were conducted by trained enumerators with pre designed semi structured questionnaire. The survey took place at the first week of January, 2022. This is also an important point to remember that throughout the research the timeline of the "*after pandemic*/*COVID*-19 *period*" indicates to that particular time. Data on Income and expenditure of selected households have been collected along with other demographic characteristics before and after pandemic.

3.2. Sample Size and Survey Design

The survey households are a mixture of male and female though the male lead household number is high in comparison. In order to find out sample size, an appropriate formula has been used, i.e.

$$\text{Sample Size,}\quad S = z^2 \times p \times \frac{(1-p)}{\text{me}^2}$$

$$\text{Adjusted sample size} = \frac{S}{1+\frac{(S-1)}{\text{Population}}}$$

where, Z=1.96, me = .05, p = .5, Population = 34000

So,

$$S = 1.96^2 \times .5 \times \frac{(1-.5)}{0.05^2} = 384.16$$

And so,

$$\text{Adjusted sample size} = \frac{384.16}{1+\frac{(384.16-1)}{34000}} = 380 \approx 400$$

The selected survey area has a very interesting geographical characteristics as one hand this area is known as the largest island of Bangladesh but also it is the fastest route to move between Dhaka to Chittagong, two of the most industrial zones. This feature made the demographic of Daulat khan a very unique one and that also has impact on the profession chosen by the people of this particular locality.

3.3. Research Tools and Techniques

As it is a household based survey where either male or female head household has been considered, so respond rate was 100 percent. Nine enumerators were assigned for data collection while one was collecting data from at least 45 respondents per day, thus, on average; it took around 2 days to complete the data collection of 405 respondents. An informed consent form was provided and verbally discussed prior to all interview. The survey was carried out for only those samples who provided the consent. Day long visit has been done by Project Director and local supervisor. Traditional PAPI method has been used in which

an enumerator fills a semi structure questionnaire.

Prior to that, a three-hour long training session has been conducted with the enumerators to address their questions and concerns regarding the survey. For data analysis, the statistical package "Stata-14" has been used.

Due to the constraint of sufficient budget, this research couldn't able to address other control variables but these could be for further research scope in future for sure.

4. Estimation Results and Findings

4.1. Descriptive Analysis

In order to get insights regarding the locality of sample area, following three charts have been constructed. Survey results showed that majority of the household heads are Male which can be of two reasons i.e. it becomes a social norm to introduce the male as the head of the house no matter if he really is or not (Figure 1). Another possible reason is majority of the income generating works are physically toilsome (fishing, day laborer etc.) and socially considered as inappropriate for females. This makes the area unsuitable for female base households.

Another interesting finding from the household information is that large number of the households do not have children more than two (Figure 2). This is very unlikely for a rural area and the reason behind this can be the location of the sample area, may be urbanization motivates them to keep the family size small. But urbanization can be questioned by observing the data of the household roof materials as only around 7% of the roofs are concrete or cement made which is ought to be the opposite (Figure 3). The reason for this also lies in the geographical location but in a different way. The area is vulnerable to natural calamity like river erosion, as a result, people living there prefers tin/tiled shed houses more in comparison to concrete/cement so that they can easily shift or rebuild their houses in minimum costs. These illustrations based on sample data help us get an insightful peak into the local context and characteristics of the sample area.

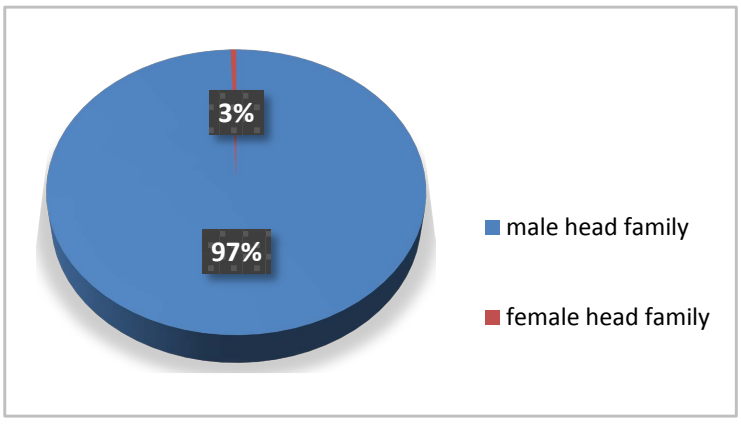

Figure 1. Household head. Source: Author's calculations.

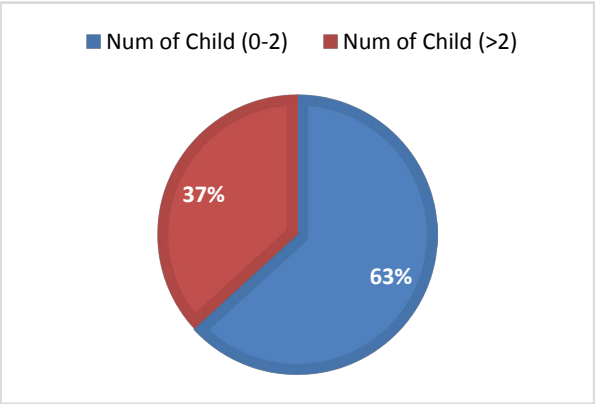

Figure 2. Number of children. Source: Author's calculations.

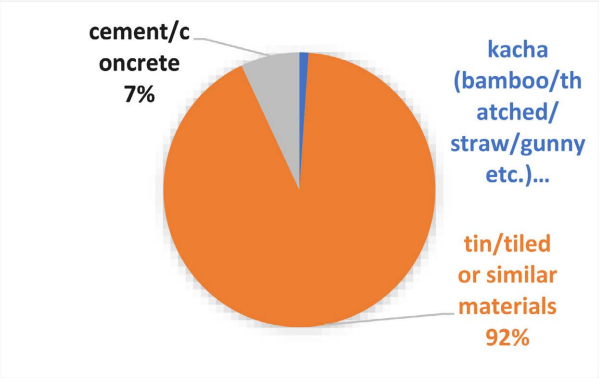

Figure 3. Roof Material of the Households. Source: Author's calculations.

Household with income level more than or equal to 20,000 taka is considered an high income level whereas below 20,000 income is treated as lower income level. Almost additional 4% households experiences shift higher income to lower income level after pandemic (Table 2). Expenditure also increases in current times considering the before COVID times. The impact of such increase in MPC will be analyzed in later sections. Likewise, number of households with an income level equal or more than 20,000 taka decreases in current times as some move to below income level due to the pandemic. Expenditure remain same for higher income group as they generally have savings to cover extra expenses in a crisis period like COVID-19.

Naturally expenditure is a income driven factor that makes mean expenditure lower as income becomes lower after pandemic (Table 3). Decreasing trend of mean income and mean expenditure of sample households after pandemic can be explained looking into sources of income and expenditure. The total income of a household comes from different sources like salary, land, asset, rent, shares etc. The change in the amount of money generated from different income sources of the households in graph reflects this claim that external shocks like pandemic does impact the income (Figure 4).

All these sources of income are reported from the survey where income from salary, share and asset has been decreased. This loss could be slightly compensated by the source of land and rent (Figure 4). Apart from these major income sources, the households of sample areas have additional income sources from different allowances (aged, widow, freedom fighters, relief) if considered eligible.

As the income of the households gets affected by the pandemic, so does their expenditure that also indicates the change in their consumption. Because of price hike, food expenditure increases, at the same time, many households try to meet their ends by taking loans and as a result expenditure to repay loans has also been increased (Figure 5). On the other hand, during the pandemic time many students get dropped out from school. Most of them are female students as they got married away by their family and male students get dropped as to join workforce to support their family with additional income. As a result, expenditure on education has been decreased. As there are high chances to get infected by COVID in hospitals or by travelling and also there are lockdowns as well which decrease the expenditure on health and travel. One interesting observation is that—expenditure on tobacco bas been increased which indicates that in time of stress, often peoples' consumption on substances increases (Figure 5).

Table 2. Income and expenditure.

Household Characteristics	Categories	Frequency	Percent
Income before COVID-19	<20,000	251	61.98
	≥20,000	154	38.02
Expenditure before COVID-19	<20,000	279	72.66
	≥20,000	105	27.34
Income after COVID-19	<20,000	267	65.93
	≥20,000	138	34.07
Expenditure after COVID-19	<20,000	300	74.07
	≥20,000	105	25.93

Source: Author's calculations.

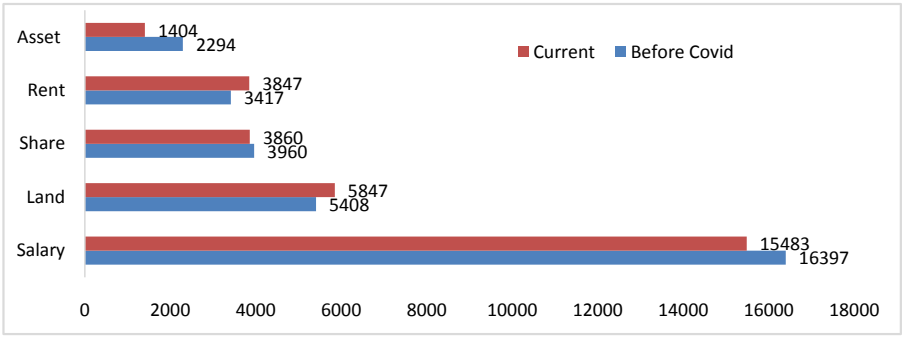

Figure 4. Comparison of income sources of households before COVID-19 and after. Source: Author's calculations.

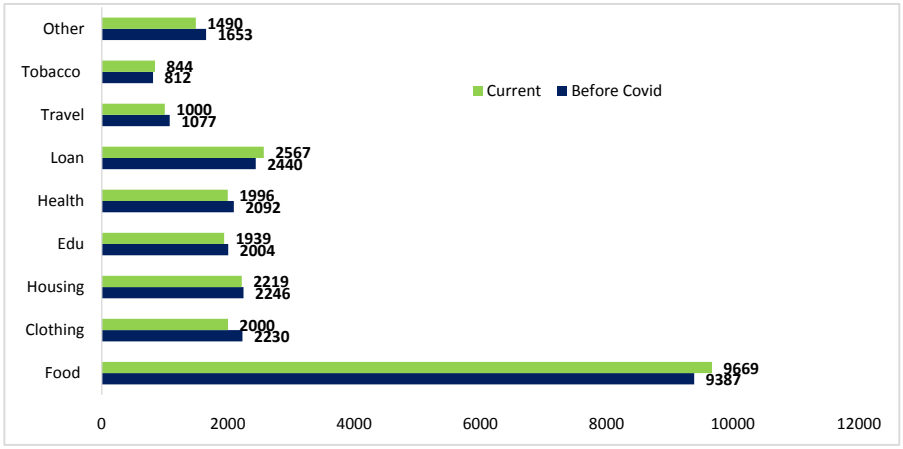

Figure 5. Comparison of different expenditure sectors before COVID and current times. Source: Author's calculations.

Table 3. Income and expenditure condition of households in different time periods.

	before COVID-19			Currently		
	Obs.	Mean	SD	Obs.	Mean	SD
Minc	389	19005.14	9978.05	402	17784.88	8947.62
Mexpd	378	17853.97	23351.63	402	16273.69	6957.86

Source: Author's calculations.

4.2. Regression Results Analysis

From the finding so far, it has been observed that with change in income, the consumption expenditure also changes—main objective of the paper. In order to know at what extent income can effect consumption, the Keynes consumption function is being used. The consumption function of Keynes is defined as

$$C = c + aY + \varepsilon$$

where, C = Total consumption, c = autonomous consumption, a = marginal propensity to consume (MPC), Y = disposable income and ε = stochastic error term

Autonomous consumption is independent of income. As consumption can never be zero, that is why even if the income is really low, still minimum level of consumption is called autonomous consumption. MPC indicates that the consumption level increase for every unit increase in the income that lies between 0 and 1. MPC is also useful as this can help to predict how a government stimulus package might affect the economy. Positive relation between consumption and disposable income does not necessarily mean that consumption will increase forever if income increases. There are some other factors that can effect our consumption must be under consideration, so the following functions don't show the direct relationship between the two variables rather how they are related to each other remaining other things constant.

Using the Keynes consumption function, the MPC of the sample households

are being calculated by using the survey data and Stata-14 software. On basis of the above consumption function,

Before COVID estimated consumption equation is:

$$C = 5462.54 + 0.595Y \quad (1)$$

From model (1), it can be stated that MPC before COVID is .595 and that is highly significant at 5% level of significance as p value is close to zero (Table 4).

Similarly, after regression, the estimated current consumption equation is-

$$C = 3484.84 + 0.720Y \quad (2)$$

The consumption function of model (2) indicates that the MPC for the same households in current situation is .720 and that is highly significant at 5% level of significance as value of p is close to zero (Table 4). By comparing the both models, it is clear that households marginal propensity to consume increased in the current situation than the before COVID times. This again proved the statement that higher MPC is associated with lower income group.

The regression results of model (1) and (2) are depicted in following:

The income-consumption analysis of the primary household survey data made a clear indication that income and consumption expenditure is positively related but the rate of consumption expenditure will depend on the income level of the household. Above table is in line with this statement i.e. at 5% level of significance, MPC of the households increased from .595 to .720 from before COVID period to current time (Table 4).

In general, people of all income groups get affected by the pandemic which in turn also affect their consumption behavior. Though all households of the sample area get equally exposed to the shock but the effect of the shock is not same for every group of households. To measure the impact of the shock on households with different income category, households with their heads involved in four major occupations are being observed. The four major occupation of the

Table 4. The regression results of Model (1) & (2).

	(1)	(2)
VARIABLES	Expenditure before COVID	Current Expenditure
Income before COVID	.595**	
	(.022)	
Current Income		.720**
		(.017)
Constant	5,462.536***	3,484.839***
	(459.627)	(324.804)
Observations	378	402
R-squared	.667	.826

Standard errors in parentheses. *** $p < .01$, ** $p < .05$, * $p < .1$. Source: Author's calculations.

sample area are (in term of the percentage of household heads involvement)—Daily laborer, Fishermen, Small Businessmen, Non-government employee. Households with income level below 20,000 Taka are considered as "Low" and households with income level of 20,000 taka or above are considered as "High" income group. The regression results for each occupation for both income level have been given in details in appendix. A summary table for the households with four major occupations and of to both high and low income group has been depicted below:

It has been observed that the main occupation is day laborer among the households of the sample area. Above table indicates that the MPC of households under this occupation with income level below 20,000 taka (low) decreases significantly in current times compared to the before COVID period. This indicates that though the mean income decreases with time but the marginal consumption for each amount of income increases. Similarly, for households with same occupation but belonging to income level "high" group (equal or more than 20,000 taka) MPC increased in current times compared to before COVID times (Table 5). This also proves the claim made by Keynes that—MPC is higher for lower income group.

Table 5. MPC of different professions across the same upazila.

	Non-government employee			
	High		Low	
	Before	Current	Before	Current
MPC	.477	.445	.555	.579
Standard error	(.097)***	(.095)***	(.099)***	(.1)***
Number of observations	23	24	34	34
	Business (small)			
MPC	.313	.788	.744	.763
Standard error	(.113)***	(.098)***	(.081)***	(.088)***
Number of observations	20	18	34	41
	Daily laborer			
MPC	.649	.671	.903	.945
Standard error	(.103)***	(.072)***	(.045)***	(.052)***
Number of observations	11	9	62	65
	Fisherman			
MPC	.508	.73	.793	.894
Standard error	(.139)***	(.165)***	(.07)***	(.07)***
Number of observations	22	19	47	53

Source: Author's calculations.

Similarly, for households with fishing as main occupation MPC increased in current times relative to before COVID times for both "high" and "low" income level. The same increase of MPC in current time is also observed in the households with small business as main occupation and also of households with non-government employment as profession but those that belong to "low" income group (Table 5). For the non-government employee households belonging to "high" income group, a different observation is found. Unlike all other households, in this particular case, MPC in current times decreased in comparison to before COVID period. There can be many reasons for that difference in MPC which can be a topic for future analysis. One of the reasons can be the risk aversion behavior of that group with the possibility that saving opportunities or scopes for this particular group is much more than other discussed groups. They may have enough saving before so that they are not adversely effected by the pandemic.

Such analysis indicates that the change in income, consumption and consequently MPC due to any sort of external shock is common for all sample households but the shock does not impact all households equally. Even, households that belong to same occupation category but different income level can get opposite effect in their MPC. There are various observed and unobserved factors that can contribute to such different impacts. In addition, there are other factors as well that can affect consumption expenditure except income. Due to time and budget restrictions, it is not possible to discuss these factors in this paper but it can definitely be the focus area for future researches.

5. Conclusion and Policy Suggestions

In its peak time during 2020-2021, lockdowns of a city or some districts have been taken in different counties to control the spread of the pandemic. Implementation of these measures has great effects on protecting the health of residents and controlling the spread of the virus. Households' income-consumption always gets affected in the wake of any sort of long-term or short-term disasters. The pandemic is no different and globally impacted the income-consumption and GDP growth. In this paper, the impact of pandemic in income-consumption pattern of a coastal area of Bangladesh has been analyzed where the majority of the population is involved in informal sector without having any economic cushion to land on in times of risk or shock. Majority of the households are involved in works like day laborers, fishermen, small businessmen, non-government employee and the educational attainment of almost all of them are less than secondary schools in the survey area. This makes it difficult for them to get involved in formal sectors or to switch their jobs. They have to stick to their occupations that is day-based labor and that is why their income gets negatively impacted in time of the pandemic due to lockdowns and strict movements. This decrease in income also impacted their consumption which can be depicted by their marginal propensity to consume (MPC) as lower income levels produce a

higher MPC than the counterparts.

Through the analysis, this is also observed that the pandemic does not affect all households equally even if they all belong to informal sector and are based on same locality. Factors like household income level, profession of household head, etc. also matter. While coming up with policies to deal with such pandemic situation and providing support, these factors need to be kept in mind. Policy makers need to remember that as not the same size fits all, similarly, the same policy or stimulus package may not be enough to meet the need of all households even if they belong to the same sort of area. Policies need to be need-basis instead of a generic one to provide a secure life to the vulnerable population. For this particular situation, the following policy implementations can be proposed:

• The daily laborer and fishermen are most vulnerable to the COVID situation and their MPC increased alarmingly which indicates that they are left with hardly anything to save as they literally live in a hand-to-mouth situation and after COVID their situation gets worse.

- Government needs to come up with specific social safety net packages to address these populations who are living in such a hand-to-mouth situation.

• As the sample area is in a very prime spot (location-wise) especially for fishermen because on one side it is the largest river basin area, on the other, it falls in the fastest route to travel between Dhaka to Chittagong. This can be used in support of the fishermen like:

- Establishing proper cold storage and transportation facilities so that the fishermen can directly sell their fish in the market at a good price which will help them earn more.

- Taking measures to reduce the middlemen effect and connecting the fishermen directly to the Dhaka-Chittagong market so that they can get a fair price.

• Providing subsidy to small business owners so that they can expand their business to cover up for the loss they have faced in time of the pandemic.

These are a few proposed policy implications that can be considered. But the key point here is that—these findings and proposed interventions are based on the data of the particular area. This area has its own distinguishing features like being a coastal area where the majority of the population is involved in informal sectors. Moreover, the research is based on a sample that is purposively selected considering the researcher's availability and acceptability in that particular area. Also due to time and resource restraints, the research has been conducted in a very limited scope but the findings from the research are insightful and leave scope for potential future research works.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

Altonji, J. G., & Siow, A. (1987). Testing the Response of Consumption to Income

Changes with (Noisy) Panel Data. *The Quarterly Journal of Economics, 102,* 293-328. https://doi.org/10.2307/1885065

Bishop, R., Boulter, J., & Rosewall, T. (2022). *Tracking Consumption during the COVID-19 Pandemic.* RBA Bulletin, March. Reserve Bank of Australia.

Campbell, J. Y., & Mankiw, N. G. (1991). The Response of Consumption to Income: A Cross-Country Investigation. *European Economic Review, 35,* 723-756. https://doi.org/10.1016/0014-2921(91)90033-F

Davis, G. (2021). The Many Ways COVID-19 Affects Households: Consumption, Time, and Health Outcomes. *Review of Economics of the Household, 19,* 281-289. https://doi.org/10.1007/s11150-021-09563-w

Friedman, M. (1957). *Theory of the Consumption Function.* Princeton University Press. https://doi.org/10.1515/9780691188485

Keynes, J. M. (1936). *The General Theory of Interest, Employment and Money.* Palgrave Macmillan.

Li, M., Zhao, T., Huang, E., & Li, J. (2020). How Does a Public Health Emergency Motivate People's Impulsive Consumption? An Empirical Study during the COVID-19 Outbreak in China. *International Journal of Environmental Research and Public Health, 17,* Article No. 5019. https://doi.org/10.3390/ijerph17145019

Meyer, B. D., & Sullivan, J. X. (2013). Consumption and Income Inequality and the Great Recession. *American Economic Review, 103,* 178-183. https://doi.org/10.1257/aer.103.3.178

Miguel, E., & Roland, G. (2006). *The Long Run Impact of Bombing Vietnam.* NBER Working Paper 11954. National Bureau of Economic Research. https://doi.org/10.3386/w11954

Paxson, C. H. (1993). Consumption and Income Seasonality in Thailand. *Journal of political Economy, 101,* 39-72. https://doi.org/10.1086/261865

Peluso, A. M., Pichierri, M., & Pino, G. (2021). Age-Related Effects on Environmentally Sustainable Purchases at the Time of COVID-19: Evidence from Italy. *Journal of Retailing and Consumer Services, 60,* Article ID: 102443. https://doi.org/10.1016/j.jretconser.2021.102443

Prezotti, J. A., Henriques, J. V. T., Favorito, L. A., Canalini, A. F., Machado, M. G., Brandão, T. B. et al. (2020). Impact of COVID-19 on Education, Health and Lifestyle Behaviour of Brazilian Urology Residents. *International Brazilian Journal of Urology, 47,* 753-776. https://doi.org/10.1590/s1677-5538.ibju.2021.99.09

Tanaka, K., Ibrahim, P., & Hean, O. (2021). *How Do Natural Disasters Change Consumption Behaviour? Estimates and Policy Responses from Thailand and the Philippines.* ISEAS—Yusof Ishak Institute.

Xiong, J., Tang, Z., Zhu, Y., Xu, K., Yin, Y., & Xi, Y. (2021). Change of Consumption Behaviours in the Pandemic of COVID-19: Examining Residents' Consumption Expenditure and Driving Determinants. *International Journal of Environmental Research and Public Health, 18,* Article No. 9209. https://doi.org/10.3390/ijerph18179209

Appendix

The Table of Regression Results for Four Major Occupations of Sample Household Heads Belonging to Both High and Low Income Level

Note:

Day Laborer=*ccu*==8; *Fisherman*=*occu*==16; *Business* (*small*)=*occu*==3 *& Non-government employee*=*occu*==2

Income level < 20,000 *Taka* = *Low, Income Level* ≥ 20,000 *Taka* = *High*

Linear regression: inc_b4cov = High if occu==2

s1h7b_mexpd_b4_covid	Coef.	St.Err.	t-value	*p*-value	[95% Conf	Interval]	Sig
s1h7a_minc_b4_covid	.477	.097	4.93	0	.276	.678	***
Constant	8850.313	2772.048	3.19	.004	3085.523	14615.103	***
Mean dependent var	22000.000		SD dependent var		5248.376		
R-squared	.537		Number of obs		23		
F-test	24.343		Prob > F		.000		
Akaike crit. (AIC)	444.566		Bayesian crit. (BIC)		446.837		

*** $p < .01$, ** $p < .05$, * $p < .1$.

Linear regression: inc_b4cov = Low if occu==2

s1h7b_mexpd_b4_covid	Coef.	St.Err.	t-value	*p*-value	[95% Conf	Interval]	Sig
s1h7a_minc_b4_covid	.555	.099	5.59	0	.353	.757	***
Constant	4956.857	1470.461	3.37	.002	1961.625	7952.088	***
Mean dependent var	13000.000		SD dependent var		2474.108		
R-squared	.494		Number of obs		34		
F-test	31.277		Prob > F		.000		
Akaike crit. (AIC)	607.619		Bayesian crit. (BIC)		610.672		

*** $p < .01$, ** $p < .05$, * $p < .1$.

Linear regression: inc_b4cov = High if occu==3

s1h7b_mexpd_b4_covid	Coef.	St.Err.	t-value	*p*-value	[95% Conf	Interval]	Sig
s1h7a_minc_b4_covid	.313	.113	2.77	.013	.076	.55	**
Constant	12760.597	3411.991	3.74	.001	5592.27	19928.923	***
Mean dependent var	21425.000		SD dependent var		7103.141		
R-squared	.299		Number of obs		20		
F-test	7.680		Prob > F		.013		
Akaike crit. (AIC)	407.357		Bayesian crit. (BIC)		409.348		

*** $p < .01$, ** $p < .05$, * $p < .1$.

Linear regression: inc_b4cov = Low if occu==3

s1h7b_mexpd_b4_covid	Coef.	St.Err.	t-value	*p*-value	[95% Conf	Interval]	Sig
s1h7a_minc_b4_covid	.744	.081	9.14	0	.578	.909	***
Constant	2597.26	1201.756	2.16	.038	149.364	5045.156	**
Mean dependent var	13441.176		SD dependent var		2134.723		
R-squared	.723		Number of obs		34		
F-test	83.637		Prob > F		.000		
Akaike crit. (AIC)	577.087		Bayesian crit. (BIC)		580.139		

*** $p < .01$, ** $p < .05$, * $p < .1$.

Linear regression: inc_b4cov = High if occu==8

s1h7b_mexpd_b4_covid	Coef.	St.Err.	t-value	*p*-value	[95% Conf	Interval]	Sig
s1h7a_minc_b4_covid	.649	.103	6.29	0	.415	.882	***
Constant	4650.366	3071.939	1.51	.164	−2298.843	11599.576	
Mean dependent var	22636.364		SD dependent var		8164.224		
R-squared	.814		Number of obs		11		
F-test	39.510		Prob > F		.000		
Akaike crit. (AIC)	213.804		Bayesian crit. (BIC)		214.599		

*** $p < .01$, ** $p < .05$, * $p < .1$.

Linear regression: inc_b4cov = Low if occu==8

s1h7b_mexpd_b4_covid	Coef.	St.Err.	t-value	*p*-value	[95% Conf	Interval]	Sig
s1h7a_minc_b4_covid	.903	.045	20.14	0	.814	.993	***
Constant	828.447	665.933	1.24	.218	−503.617	2160.51	
Mean dependent var	14088.710		SD dependent var		2194.487		
R-squared	.871		Number of obs		62		
F-test	405.808		Prob > F		.000		
Akaike crit. (AIC)	1005.895		Bayesian crit. (BIC)		1010.149		

*** $p < .01$, ** $p < .05$, * $p < .1$.

Linear regression: inc_b4cov = High if occu==16

s1h7b_mexpd_b4_covid	Coef.	St.Err.	t-value	*p*-value	[95% Conf	Interval]	Sig
s1h7a_minc_b4_covid	.508	.139	3.65	.002	.218	.799	***
Constant	7414.981	3827.614	1.94	.067	−569.282	15399.244	*
Mean dependent var	20681.818		SD dependent var		7060.193		
R-squared	.400		Number of obs		22		
F-test	13.312		Prob > F		.002		
Akaike crit. (AIC)	444.124		Bayesian crit. (BIC)		446.306		

*** $p < .01$, ** $p < .05$, * $p < .1$.

Linear regression: inc_b4cov = Low if occu==16

s1h7b_mexpd_b4_covid	Coef.	St.Err.	t-value	*p*-value	[95% Conf	Interval]	Sig
s1h7a_minc_b4_covid	.793	.07	11.40	0	.653	.933	***
Constant	1734.683	995.286	1.74	.088	−269.925	3739.291	*
Mean dependent var	12831.915		SD dependent var		2764.221		
R-squared	.743		Number of obs		47		
F-test	129.925		Prob > F		.000		
Akaike crit. (AIC)	817.462		Bayesian crit. (BIC)		821.162		

*** $p < .01$, ** $p < .05$, * $p < .1$.

Linear regression: inc_current = High if occu==2

s1h7b_mexpd_curren~y	Coef.	St.Err.	t-value	*p*-value	[95% Conf	Interval]	Sig
s1h7a_minc_currently	.445	.095	4.67	0	.248	.643	***
Constant	10246.26	2641.491	3.88	.001	4768.144	15724.376	***
Mean dependent var	22083.333		SD dependent var		5064.082		
R-squared	.498		Number of obs		24		
F-test	21.836		Prob > F		.000		
Akaike crit. (AIC)	463.978		Bayesian crit. (BIC)		466.334		

*** $p < .01$, ** $p < .05$, * $p < .1$.

Linear regression: inc_current = Low if occu==2

s1h7b_mexpd_curren~y	Coef.	St.Err.	t-value	*p*-value	[95% Conf	Interval]	Sig
s1h7a_minc_currently	.579	.1	5.82	0	.376	.782	***
Constant	4702.673	1443.264	3.26	.003	1762.841	7642.504	***
Mean dependent var	12911.765		SD dependent var		2502.939		
R-squared	.514		Number of obs		34		
F-test	33.852		Prob > F		.000		
Akaike crit. (AIC)	607.051		Bayesian crit. (BIC)		610.103		

*** $p < .01$, ** $p < .05$, * $p < .1$.

Linear regression: inc_current = High if occu==3

s1h7b_mexpd_curren~y	Coef.	St.Err.	t-value	*p*-value	[95% Conf	Interval]	Sig
s1h7a_minc_currently	.788	.098	8.02	0	.58	.997	***
Constant	2655.694	2611.347	1.02	.324	−2880.115	8191.504	
Mean dependent var	22666.667		SD dependent var		7054.410		
R-squared	.801		Number of obs		18		
F-test	64.241		Prob > F		.000		
Akaike crit. (AIC)	344.040		Bayesian crit. (BIC)		345.820		

*** $p < .01$, ** $p < .05$, * $p < .1$.

Linear regression: inc_current = Low if occu==3

s1h7b_mexpd_curren~y	Coef.	St.Err.	t-value	*p*-value	[95% Conf	Interval]	Sig
s1h7a_minc_currently	.763	.088	8.64	0	.585	.942	***
Constant	2926.309	1243.649	2.35	.024	410.792	5441.827	**
Mean dependent var	13512.195		SD dependent var			2346.508	
R-squared	.657		Number of obs			41	
F-test	74.736		Prob > F			.000	
Akaike crit. (AIC)	711.834		Bayesian crit. (BIC)			715.261	

*** $p < .01$, ** $p < .05$, * $p < .1$.

Linear regression: inc_current = High if occu==8

s1h7b_mexpd_curren~y	Coef.	St.Err.	t-value	*p*-value	[95% Conf	Interval]	Sig
s1h7a_minc_currently	.671	.072	9.26	0	.5	.842	***
Constant	4216.849	2204.835	1.91	.097	−996.757	9430.454	*
Mean dependent var	23000.000		SD dependent var			8831.761	
R-squared	.925		Number of obs			9	
F-test	85.761		Prob > F			.000	
Akaike crit. (AIC)	168.774		Bayesian crit. (BIC)			169.168	

*** $p < .01$, ** $p < .05$, * $p < .1$.

Linear regression: inc_current = Low if occu==8

s1h7b_mexpd_curren~y	Coef.	St.Err.	t-value	*p*-value	[95% Conf	Interval]	Sig
s1h7a_minc_currently	.945	.052	18.04	0	.841	1.05	***
Constant	520.497	731.397	0.71	.479	−941.084	1982.078	
Mean dependent var	13553.846		SD dependent var			2262.333	
R-squared	.838		Number of obs			65	
F-test	325.438		Prob > F			.000	
Akaike crit. (AIC)	1073.359		Bayesian crit. (BIC)			1077.708	

*** $p < .01$, ** $p < .05$, * $p < .1$.

Linear regression: inc_current = High if occu==16

s1h7b_mexpd_curren~y	Coef.	St.Err.	t-value	*p*-value	[95% Conf	Interval]	Sig
s1h7a_minc_currently	.73	.165	4.41	0	.381	1.079	***
Constant	2996.737	4249.003	.70	.49	−5967.876	11961.351	
Mean dependent var	21026.316		SD dependent var			7208.162	
R-squared	.534		Number of obs			19	
F-test	19.460		Prob > F			.000	
Akaike crit. (AIC)	379.948		Bayesian crit. (BIC)			381.837	

*** $p < .01$, ** $p < .05$, * $p < .1$.

Linear regression: inc_current = Low if occu==16

s1h7b_mexpd_curren~y	Coef.	St.Err.	t-value	*p*-value	[95% Conf	Interval]	Sig
s1h7a_minc_currently	.894	.07	12.83	0	.754	1.034	***
Constant	907.638	898.522	1.01	.317	−896.22	2711.495	
Mean dependent var	12086.792		SD dependent var		3238.473		
R-squared	.763		Number of obs		53		
F-test	164.526		Prob > F		.000		
Akaike crit. (AIC)	933.794		Bayesian crit. (BIC)		937.735		

*** $p < .01$, ** $p < .05$, * $p < .1$.