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Household Decision Making during Pandemic: Determinants & Strategies

Authors

Ms. Sofia Akram
Ms. Sidra Ahmed Qureshi
Mr. Mutee ul Rehman

Capacity Analytics

WORKING PAPER SERIES

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1. Introduction

The spread of the Covid-19 pandemic has stunned the whole world. It created a severe public health crisis globally that in turn leads to economic and social crisis. Due to this pandemic, the individuals have experienced an extensive range of adversities such as experience with virus itself, worries for families and relatives suffering from this virus, financial adversities like loss of job, income and incapability to pay utility bills and difficulty in meeting basic needs including adequate amount of food and medicine (Fluharty &Fancourt, n.d). The rapid transmission of COVID-19 has shrunk the economies and employment and livelihood opportunities are expected to decline. It is also declining the last 30 years of poverty reduction gains globally. Many families are falling into food insecurity and starvation.

In response to control the COVID-19 outbreak many countries opted to implement the policy of lock down (Salin et al. 2020). The current pandemic and resulting lock down policy has adversely affected the lives of people as economies have collapsed and there is a rise in the unemployment and joblessness during the COVID-19 period (De Marchi, 2020, Juranek et al., 2020, Van Lancker & Parolin, 2020). In addition it depressed the share of GDP of many countries as most of the industries and firms have been experiencing the challenge of their survival (El-Erian, 2020). About 3.3 billion work forces globally are at the risk of loss of their employment and most of them belong to marginalized groups or informal sectors (World Health Organization, 2020). According to Hevia & Neumeyer, 2020 the expected recession as an outcome of covid-19 is much more than the 1930s Great Depression and it effects the developing countries more severely because of the decline in exports, remittances etc.

When households are affected by different domains like job loss, income loss or food insecurity during any disaster they prepare and consider some coping strategies accordingly for their survival and prosper (Shariff & Khor (2008) and Ehebhamen et al. 2017).The term coping broadly define as a cognitive or behavioral efforts to manage stress. It is basically a behavior of individuals adopted to re-establish new routines after the experience of stressful event. There are two types of individuals coping strategies; one is problem focused coping and other one is symptom-focused coping and dichotomy between these terms has been widely used in a coping literature (Lazarus and Folkman, 1984). The problem-focused coping refers to those attempts taking by individuals to control or eliminate the stress. The symptoms-focused coping refers to activities addresses the negative feelings and consequences of the stressful events. Examples of problem-focused coping in the context of job loss will include searching for new job, seeking retraining and relocating new area for better job opportunity. Whereas, the example of symptoms-focused coping include assistance from friends, family and from government to handle abrupt economic problem and join social and community groups.

Pakistan being a developing country is not an exception in this current pandemic situation. The COVID-19 pandemic also impacts the lives of the people in Pakistan. It is highly vulnerable because it shares borders with China and Iran, both countries have reported large outbreak. The increased movement and travel due to trade, education, tourism and pilgrimage between Pakistan and its high risk neighboring countries has further aggravated the situation. The primary measures to comprehend the spread of coronavirus such as quarantines, travel restrictions and lock downs of cities has reduced the aggregate demand with the impact on service sector. The international demand for commodities also decreased and it further contributed to financial and economic

uncertainty. The reduced remittances, global demand and depressed domestic consumption are leading the private sector to delay or cancel the investment plans.

The economy of Pakistan is also severely affected due to closure of economic and business activities, decline in the trade, investment and remittances which leads to rise in unemployment poverty and food insecurity. According to a recent report by Pakistan Bureau of Statistics, the percentage of working population decline from 35% to 22 % during COVID-19 pandemic. Moreover, nearly 74% of the affected worker belong to informal sectors like self-employed, shopkeepers, daily wagers etc. Unemployment will lead to financial crisis. It is evident from this report that COVID-19 pandemic adversely affected the financial status of the households and the stats show that about 53% household experienced a reduction in their income.

Reduction in the income means reduction in the quantity and quality of food intake. World Bank conducted different phone surveys regarding the COVID-19 impact on different countries. These survey results show that in most of the countries due to the loss of income during COVID-19 crisis household reduce their food consumption which most probably leads to increase poverty and further health problems. In case of Pakistan the report by Pakistan Bureau of Statistics shows that there is an increase in severe food insecurity by 10% while moderate food insecurity increased to 30% during the pandemic crisis. However 60% household remains food secure during this period.

In order to cope up social and economic issues, different individuals use different coping strategies. The unusual and adverse circumstances of the current outbreak might affect individuals coping resources. That's why it is important to understand predictors of coping strategies to identify who is at most need of additional support. Therefore, this study is examining the different predictors of coping strategies among households during pandemic.

Objective of the study:

In the current crisis of COVID-19 pandemic, the objective of the study is to:

- Investigate the household decision making to cope up the economic situation
- Empirically investigate the demographic and adversity predictors of coping strategies

2. Literature Review

COVID-19 pandemic and subsequent lockdown policy had taken away the means of livelihood of most informal worker force. With the loss of their source of income, many people are unable to feed themselves and their families as well that create the problem of food insecurity (World Health Organization, 2020). According to World Food Summit, 1996 food security occurs when all people have sufficient physical and economic accessibility to the healthy and nutritious food at any time (De Haen, Klasen, & Qaim, 2011). During any pandemic or epidemic food insecurity or inaccessibility to adequate food because of the lack of money or other sources is the one of the key issue that in turn created health and nutrition issues (Aberman et al. 2014). Nearly 690 million people are facing the challenge of food insecurity before the current pandemic of COVID-19 and the estimated figures shows that COVID-19 pandemic adds 137 million more people in it by the end of 2020 (World Bank ,2020). Loopstra, (2020) examine the impact of COVID-19 pandemic on the vulnerability to the food insecurity in Great Britain. The finds shows that about 40% of adults faced the challenge of food insecurity and among them the most affected households are those with some disabilities or having children as a result of loss of employment income during COVID-19 period.

Food insecurity lead to malnutrition across all age groups and even this food insecurity is for short time span but it has adverse psychological, physical and emotional impact on the individual (Roetter et al. 2007,Ali et al.2013, Grammatikopoulou et al. 2019, Dunn et al.2020). COVID-19 pandemic caused destruction in many countries and acute food insecurity is one of the outcomes of it particularly in the low or middle income countries. According to Roetter et al. 2007, acute food insecurity accounts for about one tenth of the global food insecurity during disasters. Das et al. (2020) examine the extent of food insecurity during the COVID-19 in Bangladesh. They concluded that about 90% of the household experienced the problem of various types' food insecurity. Moreover the percentage of severe food insecurity is more in urban region i.e. 42% than rural region i.e. 15%.

Gerhold, (2020) examine the coping strategies of the German population during COVID-19 and lock down. The findings shows that people in Germany used mostly problem focused strategies and most of them prefer the food storage strategy during the lock down. Individual with high self-esteem which is consider as an important internal coping resource choose more problem focused strategies (Kinicki & Latack, 1990 and Terry, 1994). In addition according to different studies Men and women adopted different coping strategies during crisis. Problem focused strategies are mostly adopted by men while female prefer symptom focused strategies more (Leana and Feldman, 1991, and Suleman, Amor, & Guerra, 2016).

Corbett, (1988) stated that coping mechanism includes reduction in the quality and quantity of food intake, selling property and borrowing as well. Studies show that people use different coping strategies during different crisis. Similarly, Frade & Coelho (2015) investigate the coping strategies of household during economic crisis in Portugal. Their finding shows that the reduction in consumption was a common strategy adopted by most of the households.

In accordance with Corbett, (1988), at the time of food shortage during 1970s and 1980s in African countries, household used different coping strategies like borrowing from seller and also migrated to other regions. Similarly, Hoddinott, (2006) investigate the impact of shock on the rural household in term of assets holding by using the data from rural region of Zimbabwe for the time period 1994-1995. The findings show that during the shock household used coping strategy of selling their livestock specifically cows and

oxen for their survival. According to Devereux, S. (1993) the shock of Famine can be divided in two parts i.e. protect and modify consumption. In order to protect their consumption during food shortage the household borrow cash, sell their non-food assets, cutting their non-food expenditures, or getting food aids. On the other hand by modifying consumption it means that household reduces their food intake, or nutrients. These coping strategies during food insecurity might create further problems for the household in future (Chilowa, 1991). Ruszczyk et al. 2020 observed that food storage, cutting food intake, borrowing or taking food reliefs are the main coping strategies adopted by the Bangladeshi households in order to survive in this pandemic crisis.

Current COVID-19 outbreak created health and financial crisis. People are using different measures to cope with these crises. Predictors of coping styles affect the decision of the household in order to cope with certain crisis. Socio economic and demographic factors have significant role while deciding any coping strategy (Christensen et al. 2006, Lever, 2008 and Krueger & Chang, 2008). Further, adding in it Bolger & Zuckerman (1995) and Connor-Smith & Flachsbart (2007) argues that there is also a great influence of personality type on the decision making of household regarding coping strategies during crisis. Favoring this argument according to (Latack, Kinicki, & Prussia 1995, Lazarus & Folkman, 1984 and Leana & Feldman, 1995), the internal like self-esteem and external characteristics like social suport possessed by or accessible to the individual have great impact on deciding the coping strategy.

However, whatever coping strategy an individual adopts for their survival during any disaster, it has significant health or psychological effects in long run (Billings & Moos, 1981, Fluharty & Fancourt 2020 and Busch et al 2020). In the light of these studies it is important to clearly understand the problems faced by the household during the current COVID-19 pandemic and their coping strategies to mitigate these problems so that the policy makers can design the appropriate policies and programs for these household in order to protect them from further difficulties in long run or future. The aim of this present study is to examine the determinants and short-term coping strategies adopted by the Household during COVID-19 Pandemic for the case of Pakistan.

3. Data and Methodology

3.1 Data

This study employs primary data on coping strategy and its predictors from Pakistan Bureau of Statistics (PBS). Pakistan Bureau of Statistics (PBS) has conducted special survey for evaluating impact of COVID-19 on wellbeing of people at national and provincial level based on the level of effects of this crisis on Employment, Food security and general wellbeing of the population for informed decision making. A separate section has been allotted to coping strategies with a focus on household decisions to cope up the economic situation during COVID-19. In this study, this section has been further divided into four categories;

1. Reduction in food intake
2. Delayed payment of liabilities
3. Spending of savings and loans
4. Selling of property or assets.

Each category includes different coping strategy and it has shown in below table.

Table 4.1: Description of Dependent Variable: Coping Strategy

Category	Description
0: Reduction in food intake	Reduced quantity of food intake
	Switched to lower quality or cheaper food
1: Delayed payment of liabilities	Delayed payment of loans
	Non-payment of electricity bills
	Non-payment of gas bills
	Reduced non-food expenses i.e. health, education, clothing etc.
3: Spending of savings and loans	Spent savings or investments
	Loans from relatives or friends
	Loans from employers/money lenders/ traders
	Loans form formal sources/NGOs/Banks
	Asked and received help/gift assistance form others in the community
4: Selling of property/Assets	Sold productive assets or means of transport
	Sold household assets/goods
	Sold last productive/female animal
	Sold house/land/plot
	Consumed seed stock held for the next season

Predictors

Demographic and Socio-economic predictors

Demographic and socio-economic predictors include Gender of household head, level education (Illiterate and higher education which include professional degree or higher education), number of household member, number of older people in house, number of children in house, family income of a household and region either living in rural area or urban area.

Adversity predictors

It includes the experience of households which they have faced during pandemic like financial adversities (whether a family member lost their job or face any effect on their job during the lockdown), challenges to get adequate amount of food (moderate food insecurity and acute food insecurity) and ownership of land or property (Agriculture land, residential/commercial plots, owned house and commercial property).

3.2 Construction of Variables and Descriptive Statistics

Table 4.2: Descriptive Statistics of Categorical Variables

Dependent Variable		
Variable Name	**Variable Category**	**Percentages**
Coping Strategies ($coping_i$)	= 0 "Reduce Food Intake"	3%
	= 1 "Delayed Payments"	14%
	= 2 "Loans/savings"	65%
	= 3 "Selling Property"	19%
Independent Variable(s)		
Variable Name	**Variable Category**	**Percentages**
No. of household members in ith household ($HH\_memeber_i$)	= 1 to 20 Average no. of household members	5
No. of older in ith household ($oldcount_i$)	= 0 "No older persons" 1 – 7 "1 – 7 older persons"	81% 19%
No. of children in ith household ($childcount_i$)	=0 "No children" 1 – 14 "1 to 14 children"	27% 73%
Average household income of ith household (HHpost_inc$_i$)	Average household income post COVID-19 lockdown	PKR 25,479
Gender of head of ith household ($genderhead_i$)	0= "Female" 1= "Male"	6% 93%
Moderate food insecurity in ith household ($modfood_i$)	0= "No" 1= "Yes"	69% 31%
Acute food insecurity in ith household ($acfood_i$)	0= "No" 1= "Yes"	86% 14%
Illiteracy ($illiterate_i$)	0= "No" 1= "Yes"	60% 40%
Higher education (hi_edu_i)	0= "No" 1= "Yes"	93% 7%
Job effect ($jobeffect_i$)	0= "No household members whose job was effected due to COVID-19 pandemic lockdown"	47%
	1 – 7 "1 - 7 household members whose job was effected due to CPVID-19 pandemic lockdown"	53%
Agriculture land ownership ($agriland_i$)	0= "No"	83%
	1= "Yes"	17%
Residential plot ownership ($resid_i$)	0= "No"	96%
	1= "Yes"	4%
Own House ownership ($house_i$)	0= "No"	30%
	1= "Yes"	70%
Commercial Property ownership ($comproperty_i$)	0= "No"	99%
	1= "Yes"	1%
Region ($region_i$)	0= "No"	41%
	1= "Yes"	59%

Econometric Model

In this study, the dependent variable is analyzed in four cases (according to its four corresponding categories). In such a scenario, multinomial logistic regression model is employed (mlogit). In employing the multinomial logit regression, one category of the dependent variable is selected as the baseline or reference category, and then the odds of falling in the reference category relative to falling in the base category are calculated. The mlogit model can be written as:

$$n_{ij} = log\frac{\pi_{ij}}{\pi_{iJ}} = \alpha_j + x_i^{'}\beta_j$$

Where α_j is a constant and β_j is a vector of regression coefficients, for j=1,2,...,J−1.

The command mlogit was run on STATA to attain the results of regressing coping strategies on 15 independent variables. The mlogit equation for coping gtrategies is as follows:

$$\begin{aligned}
coping_i = \delta_0 &+ \delta_1 HH\_member_i + \delta_2 oldcount_i + \delta_3 childcount_i + \delta_4 HHpost\_inc_i \\
&+ \delta_5 genderhead_i + \delta_6 modfood_i + \delta_7 acfood_i + \delta_8 illiterate_i \\
&+ \delta_9 hi\_edu_i \ \delta_{10} jobeffect_i + \delta_{11} agriland_i + \delta_{12} resid_i + \delta_{13} house_i \\
&+ \delta_{14} comproperty_i + \delta_{15} region_i + \varepsilon_i
\end{aligned}$$

4. Coping Strategies during COVID-19/ Household Decisions to Cope Up Economic Situation during Pandemic

This section demonstrates that people not only make their decisions according to their demographic and social status but there are some other adversities related to ways that people cope. People change their coping strategies according to their economic situation. As it is highlighted in above discussion the coping strategies has divided into four categories. These categories are:

- Reduction in food
- Delayed payment of liabilities
- Spending of savings and loans
- Selling of property and assets

Table 4.2: Descriptive Statistics

Variables	Category	Coping1: Reduction in food intake	Coping2: Delayed Payment of Liabilities	Coping3: Spending Loans and savings	Coping 4: Selling Assets and Property
		%	%	%	%
Gender	Male	95.2	93.3	93.5	93.7
	Female	4.8	6.7	6.5	6.3
Education	Illiterate	55.4	39.5	39.4	48.8
	Higher education	9.6	8.7	8.1	4.9
	0	84.3	80.6	82.9	81.2

No. of Older people in house	1-3	15.6	19.1	17.0	18.7
No. of children in house	0	38.5	23.1	24.4	20.1
	1-5	55.42	71.5	71.3	71.4
	6-10	6.0	5.1	4.1	8.2
Region	Urban	43.3	56.1	77.6	56.1
	Rural	56.6	43.8	22.3	43.8
Food Insecurity	Moderate	9.5	42.8	36.0	48.8
	Acute	1.2	5.4	13.4	23.4
Job Effect	0	56.6	51.2	21.2	26.9
	1-3	43.42	46.8	76.7	70.7
	4-7	0.00	1.9	2.0	2.0
Ownership	Agriculture land	5.9	15.8	48.3	30.0
	Residential	2.5	14.7	72.7	10.1
	Owned house	2.3	11.1	69.4	17.2
	Commercial property	0.0	13.6	77.3	9.1

4.1 Reduction in Food

Reduction in food is an important category. The pandemics reduced income and disrupt supply chain. Due to which people reduce quantity and quality of their food consumption.
This category of coping strategy includes:
- Reduced quantity of food intake
- Switched to lower quality or cheaper food

The above table depicts that strategy of reduced food has adopted by the 95% male head of the family and 55% of illiterate head of the family. While very less percentage of professional people (9.6%), and who have their property means 5.9% of people with agriculture land and 2.5% of people with residential house has opted this coping strategy. According to survey, the people who have lost their job or face any effect on job and who have commercial property have not cut down the quantity and quality of their food consumption. The 55% of households who have 1 to 5 children have also adopted this strategy. The 56.6% of people who are living in rural areas have also reduced their food intake as compare to people living in urban areas.

4.2 Delayed Payment of Liabilities

This is another coping strategy that people opted to handle their economic condition because during CoVID-19 the economic activities of country has slowed down.

This category includes:

- Delayed payment of loans
- Non- payment of electricity bills
- Non-payment of gas bills
- Reduced non-food expenses i.e. health, education, clothing etc.

The above table illustrates that 93% family heads which are male and 39.5% illiterate heads of family has delayed the payment of liabilities to cope up the economic situation during COVID-19. According to survey, almost 7% of females are heading their family. So

out of 7% female heads the 6.7% has adopted this strategy. The households who have face the moderate food insecurity and have agriculture land, residential and commercial property have also go for coping strategy of delayed payments of liabilities. The 43% of families where 1 to 3 individuals who have lost their job or have faced any effect on job has also delayed payment of liabilities. The 56% of people living in urban area have also adopted this category in order to overcome the economic pressure during the COVID-19.

Spending Savings and Loans

This category is very broad and important that covers the savings and loans from formal and informal sector. When a shock or crisis hits an economy, the household financial decision makers usually spend their savings and borrow money from formal and informal sources.

This category includes:

- Spent savings or investments
- Loans from relatives or friends
- Loans from employers/money lenders/ traders
- Loans form formal sources/NGOs/Banks
- Asked and received help/gift assistance from others in the community

Form the above descriptive statistics it can be noted that majority of the households have used their savings and loans during the pandemic. The 93% of male family heads and 6% of female heads have spent their savings and borrowed money from different sources. The 48.3%, 72.7%, 69.4% and 77.3% households who have agriculture land, residential land, own house, commercial property have spent their savings and loans respectively. The 76.7% households where 1-3 individuals who have lost their job or faced any type of difficulty in their working hours have used their savings and borrowed money. Moreover, the majority of the family heads who are either male or illiterate have taken decision to spend savings and loans to overcome the economic burden.

Selling of property or Assets

Selling of property or assets is another important category. When people suffer badly from any shock or crisis then they sell their property and assets.

This category includes:

- Sold productive assets or means of transport
- Sold household assets/goods
- Sold last productive/female animal
- Sold house/land/plot
- Consumed seed stock held for the next season

The descriptive statistics presented in above table shows that 93.7% male head of family have adopted selling of property or assets to cope up economic situation. The 48.8% illiterate head of family also adopted this coping strategy. The 71.4% families who have 1-5 children they have sold their property or assets to overcome their economic burden. The person who have lost their job or have reduced their working hours and salary, they have also gone for the selling of property or assets.

Table 4.4: Summarized Regression Results for Coping Strategies

| | Base Categories | | | | | | | | | | | |
| Independent Variables | Category 0: Reduced Food Intake | | | Category 1: Delayed Payments | | | Category 2: Loans and Savings | | | Category 3: Selling Property | | |
	1	2	3	0	2	3	0	1	3	0	1	2
No. of household members	0.265 (0.007**)		0.272 (0.006**)	-0.265 (0.007**)	-0.132 (0**)			0.132 (0**)	0.139 (0**)	-0.2720 (0.006**)		-0.1391 (0**)
No. of older people in house					0.101 (0.021**)			-0.101 (0.021**)				
Gender of Household Head	-1.105 (0.05*)	-1.041 (0.055*)	-0.969 (0.084*)	1.105 (0.05*)			1.041 (0.055*)			0.9687 (0.084*)		
Moderate Food Insecurity	2.114 (0**)	1.541 (0**)	1.837 (0**)	-2.114 (0**)	-0.573 (0**)	-0.277 (0.054*)	-1.541 (0**)	0.573 (0**)	0.296 (0.009**)	-1.8368 (0**)	0.2769 (0.054*)	-0.2961 (0.009**)
Acute Food Insecurity					1.414 (0**)	1.845 (0**)		-1.414 (0**)	0.430 (0.002**)	-1.9515 (0.067*)	-1.8448 (0**)	-0.4304 (0.002**)
Illiteracy	-0.935 (0.001**)	-0.748 (0.004**)	-0.703 (0.009**)	0.935 (0.001**)		0.232 (0.091*)	0.748 (0.004**)			0.7028 (0.009**)	-0.2324 (0.091*)	
No. of people whose jobs were affected due to COIVD-19		0.767 (0**)	0.792 (0**)		0.535 (0**)	0.560 (0**)	-0.767 (0**)	-0.535 (0**)		-0.7922 (0**)	-0.5601 (0**)	
Ownership of Agriculture land	-0.712 (0.024**)	-0.937 (0.001**)		0.712 (0.024**)		0.641 (0.001**)	0.937 (0.001**)		0.867 (0**)		-0.6414 (0.001**)	-0.8665 (0**)
Ownership of Residential Plot									-0.509 (0.051*)			0.509 (0.051*)
Owned House				0.604 (0**)	0.534 (0**)		-0.604 (0**)				-0.5344 (0**)	
Region		-1.047 (0**)		-1.013 (0**)	-0.342 (0.015**)		1.047 (0**)	1.013 (0**)	0.672 (0**)		0.3416 (0.015**)	-0.6717 (0**)

Note:
**p<0.05;*p<0.10

Table : Variables Significant for Each Category of Coping Strategies

Category 0: Reduced Food Intake	Category 1: Delayed Payment	Category 2: Loans and savings	Category 3: Selling Property
No. of household members	No. of household members	No. of household members	No. of household members
Gender of household head	Gender of household head	No. of children in household	Moderate food insecurity
Moderate food insecurity	Moderate food insecurity	Gender of household head	Acute food insecurity
Illiteracy	Acute food insecurity	Moderate food insecurity	Illiteracy
No of people in household whose job has been affected	Illiteracy	Acute Food insecurity	No of people in household whose job has been affected
Ownership of agriculture land	No of people in household whose job has been affected	Illiteracy	Ownership of agriculture land
	Ownership of agriculture land	No of people in household whose job has been affected	Ownership of residential plot
	Ownership of own house	Ownership of agriculture land	Ownership of own house
	Region	Ownership of residential plot	Region
		Ownership of own house	
		Region	

Table 4.5 summarizes the results of four cases where each category of coping strategy (Category 0: Reduce food intake, Category 1: Delayed payments, Category 2: Loans and savings, Category 3: Selling property) is selected as base category; the table illustrates the results of comparison categories for all four cases. The following variables have a significant impact on which strategy a household may opt to cope up with the impact of COVID-19 on household level:

1. Number of household members in a household
2. Number of older persons in a household
3. Gender of household head
4. Moderate food insecurity in households
5. Acute food insecurity in households
6. Illiteracy
7. Number of people in a household whose job has been affected by COVID-19 pandemic/lockdown
8. Ownership of agriculture land
9. Ownership of residential plot
10. Ownership of own house
11. Region

However higher education and ownership of commercial property had an insignificant impact on household decision making of coping strategies. Results indicate number of older

persons in a household is not significant for any category of coping strategies, number of children in a household is significant for only one coping strategy i.e., loans and savings, while number of household members is significant for all four coping strategies. This implies for household decision of reducing food intake, delaying payments or selling property to cope up with the economic impact of COVID-19 pandemic/lockdown, for an average household the number of children or older persons does not matter, rather the number of household members does. As the number of household members increase by 1, the relative risk of delaying payments or selling property is greater than the relative risk of reducing food intake or taking loans and savings. With an increase of 1 child in the household the relative risk of taking loans or using savings is greater than that of delaying payments. Gender of head of household is significant for category 0, 1 & 2 of coping strategies, if the head of household is male the relative risk of reducing food intake is greater than that of delaying payments or taking loans or selling property.

31% of households faced moderate food insecurity during the COVID-19 pandemic lockdown, while 14% faced acute food insecurity. Mood food insecurity had a significant impact on all four coping strategies and acute food insecurity had a significant on all coping strategies except reduced food intake. If a household is facing moderate food insecurity, the relative risk for it opting to delaying payments is greater than the relative risk of reducing food intake or taking loans or selling property. Similarly, for the same household the likelihood of selling property is greater than that of reducing food intake or taking loans. In comparison to this, households facing acute food insecurity have the greatest risk of selling property relative to other coping strategies. Such households have a greater relative risk of taking loans as compared to reducing food intake or delaying payments.

If a person is illiterate, he/she is more likely to opt for reducing food intake as a coping strategy as compared to other coping strategies. He/she is also at a greater risk of selling property relative to delaying payments. If the number of individuals whose job was affected due to COVID-19 pandemic increases by one in a household, the relative risk of them taking loans and selling property is greater than that of reducing food intake and delaying payments.

Ownership of agricultural land had a significant impact on all coping strategies, Agriculture landowners are more likely to reduce food intake or sell property in comparison to delaying payments or taking loans. Residential plot owners have a greater relative risk of taking loans than that of selling property. House owners have a greater relative risk of taking loans or selling property than delaying payments. Rural households are more likely to delay payments as compared to taking loans or selling property.

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APPENDIX

Table

	Coping Strategies								
	0: Reduced Food Intake			**2: Loans and Savings**			**3: Selling Property and Assets**		
Variables	**Coef.**	**P > |z|**	**RRR**	**Coef.**	**P > |z|**	**RRR**	**Coef.**	**P > |z|**	**RRR**
No. of household members	-0.265	**0.007****	0.767	-0.132	**0****	0.876	0.007	0.875	1.007
No. of older people in house	-0.180	0.479	0.835	-0.078	0.464	0.925	-0.062	0.630	0.940
No. of children in house	0.046	0.700	1.047	0.101	**0.021****	1.106	0.065	0.215	1.068
Income of household	0.000	0.494	1.000	0.000	0.787	1.000	0.000	**0****	1.000
Gender	1.105	**0.05***	3.021	0.064	0.761	1.067	0.137	0.595	1.147
Moderate food	-2.114	**0****	0.121	-0.573	**0****	0.564	-0.277	**0.054***	0.758
Acute food	-0.107	0.921	0.899	1.414	**0****	4.114	1.845	**0****	6.327
Illiterate	0.935	**0.001****	2.548	0.188	0.101	1.206	0.232	**0.091***	1.262
High education	0.272	0.590	1.312	-0.083	0.673	0.921	0.058	0.828	1.060
Job effect	-0.232	0.249	0.793	0.535	**0****	1.707	0.560	**0****	1.751
Agriculture land	0.712	**0.024****	2.037	-0.225	0.196	0.798	0.641	**0.001****	1.899
Residential Plot	0.046	0.936	1.047	0.106	0.633	1.112	-0.403	0.202	0.668
Owned House	0.445	0.103	1.561	0.604	**0****	1.829	0.534	**0****	1.706
Commercial property	-12.116	0.979	0.000	-0.117	0.799	0.889	-0.354	0.594	0.702
Region	0.034	0.906	1.034	-1.013	**0****	0.363	-0.342	**0.015****	0.711
_cons	-1.670	0.010	0.188	1.704	0.000	5.496	-0.598	0.045	0.550

Note: **$p<0.05$; *$p<0.10$

Coping Strategy (1) = Delayed Payment is the base category

Multinomial logistic regression		Number of obs	=	3,804
		LR chi2(45)	=	632.2
		Prob > chi2	=	0
Log likelihood = -3083.945		Pseudo R2	=	0.093

Table:

Variables	0: Reduced Food Intake			1: Delayed Payments			3: Selling Property and Assets		
	Coef.	**P > |z|**	**RRR**	**Coef.**	**P > |z|**	**RRR**	**Coef.**	**P > |z|**	**RRR**
No. of household members	-0.133	0.162	0.876	0.132	**0****	1.142	0.139	**0****	1.149
No. of older people in house	-0.102	0.673	0.903	0.078	0.464	1.081	0.016	0.868	1.016
No. of children in house	-0.054	0.639	0.947	-0.101	**0.021****	0.904	-0.035	0.379	0.965
Income of household	0.000	0.434	1.000	0.000	0.787	1.000	0.000	**0****	1.000
Gender	1.041	**0.055***	2.832	-0.064	0.761	0.938	0.072	0.709	1.075
Moderate food	-1.541	**0****	0.214	0.573	**0****	1.774	0.296	**0.009****	1.345
Acute food	-1.521	0.152	0.218	-1.414	**0****	0.243	0.430	**0.002****	1.538
Illiterate	0.748	**0.004****	2.112	-0.188	0.101	0.829	0.045	0.658	1.046
High education	0.355	0.459	1.426	0.083	0.673	1.086	0.141	0.511	1.151
Job effect	-0.767	**0****	0.464	-0.535	**0****	0.586	0.025	0.674	1.025
Agriculture land	0.937	**0.001****	2.552	0.225	0.196	1.252	0.867	**0****	2.379
Residential Plot	-0.060	0.913	0.942	-0.106	0.633	0.899	-0.509	**0.051***	0.601
Owned House	-0.158	0.542	0.854	-0.604	**0****	0.547	-0.069	0.496	0.933
Commercial property	-11.998	0.980	0.000	0.117	0.799	1.125	-0.237	0.665	0.789
Region	1.047	**0****	2.849	1.013	**0****	2.755	0.672	**0****	1.958
_cons	-3.374	0.000	0.034	-1.704	0.000	0.182	-2.302	0.000	0.100

Note: **p<0.05; *p<0.10

Coping Strategy (2) =Land and savings is the base category

Multinomial logistic regression	Number of obs	=	3,804
	LR chi2(45)	=	632.2
	Prob > chi2	=	0
Log likelihood = -3083.945	Pseudo R2	=	0.093

Table

	Coping Strategies								
	0: Reduced Food Intake			**1: Delayed Payments**			**2: Loans and Savings**		
	Coef	**P > |z|**	**RRR**	**Coef**	**P > |z|**	**RRR**	**Coef**	**P > |z|**	**RRR**
No. of household members	-0.2720	**0.006****	0.7619	-0.0067	0.8750	0.9934	-0.1391	**0****	0.8701
No. of older people in house	-0.1186	0.6380	0.8881	0.0618	0.6300	1.0638	-0.0162	0.8680	0.9839
No. of children in house	-0.0191	0.8730	0.9811	-0.0654	0.2150	0.9367	0.0351	0.3790	1.0358
Income of household	0.0000	**0.035****	1.0000	0.0000	**0****	1.0000	0.0000	**0****	1.0000
Gender	0.9687	0.084*	2.6344	-0.1368	0.5950	0.8721	-0.0724	0.7090	0.9302
Moderate food	-1.8368	**0****	0.1593	0.2769	**0.054***	1.3190	-0.2961	**0.009****	0.7437
Acute food	-1.9515	**0.067***	0.1421	-1.8448	**0****	0.1581	-0.4304	**0.002****	0.6503
Illiterate	0.7028	**0.009****	2.0195	-0.2324	**0.091***	0.7926	-0.0448	0.6580	0.9562
High education	0.2140	0.6760	1.2386	-0.0578	0.8280	0.9438	-0.1406	0.5110	0.8689
Job effect	-0.7922	**0****	0.4529	-0.5601	**0****	0.5712	-0.0251	0.6740	0.9752
Agriculture land	0.0702	0.8180	1.0727	-0.6414	**0.001****	0.5265	-0.8665	**0****	0.4204
Residential Plot	0.4490	0.4490	1.5668	0.4028	0.2020	1.4960	0.5092	**0.051***	1.6640
Owned House	-0.0891	0.7420	0.9147	-0.5344	**0****	0.5860	0.0692	0.4960	1.0717
Commercial property	-11.7616	0.9800	0.0000	0.3542	0.5940	1.4250	0.2367	0.6650	1.2671
Region	0.3752	0.1810	1.4553	0.3416	**0.015****	1.4073	-0.6717	**0****	0.5108
_cons	-1.0721	0.0960	0.3423	0.5977	0.0450	1.8180	2.3017	0.0000	9.9907

Note: **p<0.05; *p<0.10

     Coping Strategy (3) = Selling Property and assets is the base category

Multinomial logistic regression				
	Number of obs	=	3,804	
	LR chi2(45)	=	632.2	
	Prob > chi2	=	0	
Log likelihood = -3083.945	Pseudo R2	=	0.093	

Table 4.3: Multinomial Regression Output for Coping Strategies (Base Category: Reduced Food Intake)

	Coping Strategies								
	1: Delayed Payments			**2: Loans and Savings**			**3: Selling Property or assets**		
Variables	**Coef.**	**P > |z|**	**RRR**	**Coef.**	**P > |z|**	**RRR**	**Coef.**	**P > |z|**	**RRR**
No. of household members	0.2653339	**0.007****	1.303866	0.1328542	0.162	1.142083	0.2719903	**0.006***	1.312574
No. of older people in house	0.1804754	0.479	1.197787	0.1023937	0.673	1.107826	0.1186259	0.638	1.125949
No. of children in house	-0.0463014	0.7	0.9547542	0.0542472	0.639	1.055746	0.0191196	0.873	1.019304
Income of household	4.77E-06	0.494	1.000005	5.31E-06	0.434	1.000005	-0.0000157	**0.035***	0.999984
Gender	-1.105478	**0.05***	0.3310527	-1.041024	**0.055***	0.353093	-0.9686552	**0.084***	0.379593
Moderate food	2.113701	**0****	8.278828	1.54071	**0****	4.667903	1.836827	**0****	6.276592
Acute food	0.1066399	0.921	1.112534	1.521103	0.152	4.57727	1.951454	0.067*	7.038918
Illiterate	-0.935203	**0.001****	0.3925062	-0.7475803	**0.004***	0.473511	-0.7028279	**0.009***	0.495183
High education	-0.2717857	0.59	0.7620175	-0.3545247	0.459	0.701507	-0.2139621	0.676	0.807379
Job effect	0.2320735	0.249	1.261212	0.7670512	**0****	2.153407	0.7921661	**0****	2.208174
Agriculture land	-0.7116464	**0.024***	0.4908354	-0.9367189	**0.001***	0.391912	-0.0702104	0.818	0.932198
Residential Plot	-0.0462564	0.936	0.9547971	0.0601641	0.913	1.062011	-0.4490307	0.449	0.638247

Owned House	-0.4452721	0.103	-0.6406499	0.1583471	0.542	1.171573	0.0891157	0.742	1.093207
Commercial property	12.11575	0.979	182727.2	11.99831	0.98	162479.3	11.7616	0.98	128232.3
Region	-0.033597	0.906	0.9669611	-1.046967	0**	0.351001	-0.3752361	0.181	0.687127
_cons	1.669786	0.01	5.311033	3.373717	0	29.1868	1.072064	0.096	2.921402

Note: **p<0.05; *p<0.10

Coping Strategy (0) = Reduced Food Intake is the base category   Pseudo R^2 =   0.093
Number of observations = 3,804   LR chi2(45) = 632.2
Log likelihood = -3083.945   Prob > chi2 =0

The multinomial logit regression (mlogit) employed here can be used to identify the relative risk for a household of using a certain coping strategy out of the four identified in the model. For analysis, this study selected reduced food intake as the base coping strategy. The results of remaining coping strategies i.e., delayed payments, loans/savings and selling property will be analyzed relative to the base category i.e., reduced food intake.

Number of household members is a positive predictor significant of category 1 and 3 coping strategies. The log odds of delaying payments for a household with 1 more member are 0.26 points greater than a household with 1 less member. This implies, if the number of members in a house increase by 1, there is a greater risk of that household using delayed payment as a coping strategy and a lower risk of it reducing food intake. With a 1 unit increase in household members, the relative risk of delaying payments increases by a factor of 1.30. The log odds of selling property for a household with 1 more member are 0.27 points greater than a household with 1 less member. This implies, when household members increase by 1 unit, there is a greater risk of that household selling property to cope with the impact of the COVID-19 pandemic compared to reducing food intake. The RRR value for household members indicates that for each 1 unit increase in the number of household members, the relative risk of belonging to the "selling property" group changes by a factor of 1.31. Summing up, results suggest that as the number of household members' increases, the risk of belonging to the group of "delayed payments" increases and that of "reduced food intake" reduces. Similarly, as the number of household members increases, the risk of belonging to the group of "selling property" increases and that of "reduced food intake" decreases.

Average income of household post COVID-19 lockdown is a negative and significant predictor for coping strategy 3 i.e., selling property. With each one unit increase in average income of household (post COIVD-19 lockdown), the log odds of falling in the selling property group (relative to reduce food intake group) is predicted to decrease. Further, with an increase of one unit in income of household, the relative risk of belonging to the 'selling property' group changes by a factor of 0.99, which implies that the risk of belonging to the group that opted for 'selling property' decreases and the risk of belonging to the group that opted for 'reducing food intake' increases.

Gender of household head is a negative predictor and is significant for all three categories of coping strategies i.e., delayed payments, loans/savings and selling property. The log odds of delaying payments (relative to reducing food intake) for male household heads are predicted to be 1.11 points less than that for females. The results suggest males are at a higher risk of reducing food intake and at a lower risk of delaying payments. The log odds of taking a loan or using savings (relative to reducing food intake) for male household heads is predicted to be1.04 points led than that for females. The RRR value for household head gender indicates the relative risk of a household head to be identified as a male are 0.35 times of that of female. This means males are at a lower risk of falling in the 'loan/savings' category and at a higher risk of falling in the 'reduce food intake' category.

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For females, the picture is reversed. Furthermore, the log odds of selling property (relative to reducing food intake) for a male household head are predicted to be 0.96 points less than that for females. The RRR value here suggests that a male has a lower relative risk of falling in the 'selling property' category and at a higher risk of being in the 'reduce food intake' group.

Moderate food insecurity is a positive predictor significant for all three categories of coping strategies. The log odds of delaying payments (relative to reducing food intake) for a household facing moderate food insecurity are predicted to be 2.11 points greater than for a household not facing moderate food insecurity. The relative risk for a house facing moderate food insecurity of delaying payments is greater and the relative risk of it reducing food intake is lower. The log odds of using loans/savings (relative to reducing food intake) for a household facing moderate food insecurity are predicted to be 1.54 points greater than for a household not facing moderate food insecurity. This implies the relative risk for moderately food insecure household of taking loans/using savings is greater and the relative risk of it reducing food intake is lower. Similarly, households facing moderate food insecurity are at a higher risk of selling property to cope up with the impact of COVID-19 and are at a lower risk of reducing food intake.

Acute food insecurity is a positive and significant predictor for coping strategy 3 which is selling property or assets. If a household has acute shortage of food will increase one unit the log odds of falling into category of selling property or assets than the coping strategy of reduction in food intake is predicted to increase by 1.95 units. Further, the relative risk ratio of a household facing acute food insecurity shows that relative risk of belonging to the selling of property or assets relative to the risk of belonging to the category of reduction in food intake is predicted to change by a factor of 7.03.

Illiterate is a negative and significant predictor for all the categories of coping strategy. If a person is illiterate or not having education then in order to cope up economic situation during COVID-19 there is lower chance to opt coping strategy of delayed payment, selling property or assets and spending of loans and savings and there is greater chance to opt reduction in food intake. The relative risk ratio of this predictor indicates that the relative risk of illiterate person is increased to go for reduction in food intake which is base category and relative risk to opt delayed payment, selling property or assets and spending of loans and savings is decreased.

The variable of job effect which includes the number of individuals who have lost their job or face any effect on their job is positive and significant predictor of two coping strategies i.e. spending of loans and savings and selling property or assets. If the job loss or any effect on job is increased by one person in a house, the log odds of falling into the category of spending of loans and savings relative to the reduction in food intake is predicted to increase by 0.76 units. This means, the person who lost their job or face any effect on their job they will spend their savings or take loans to fulfill their basic needs. The relative risk for an individual face effect on job or job loss is greater for the spending loans and savings and the relative risk of reduction in food intake is lower. Similarly, the log odds of selling property or assets than the reduction in food intake for a person who lost job

or face effect on job is predicted to increase by 0.79 units. The individual who face job effect are at a higher risk of selling property to cope up with the impact of COVID-19 and are at a lower risk of reducing food intake.

The region is negative and significant predictor of coping strategy of spending of savings and loans. The log odds of spending loans and savings (relative to reducing food intake) for person who lived in rural area are predicted to be 1.04 points less than who lived in urban area. The result indicates that rural person is at higher risk to reduce food intake than the spending of savings and loans. The relative risk of falling into category of spending loans and savings than the reduction in food intake is decreased by a factor of 0.35.

The variable of agriculture land is significant and negative predictor of two coping strategies which include delayed payment of liabilities and spending of savings and loans. The negative sign shows that if a person own agriculture land the log odds of falling into category of delayed payment of loan is decreased to 0.71 units and for the spending of loans and savings decreased to 0.93 units. It means if a person has ownership of land then in order to cope up economic situation during COVID-19 there is lower chance to opt coping strategy of delayed payment and spending of loans and savings and there is greater chance to opt reduction in food intake. The relative risk ratio of this predictor indicates that the relative risk of person having agriculture land is increased to go for reduction in food intake which is base category and relative risk to opt delayed payment and spending of loans and savings is decreased.