

COVID-19 Pandemic and the Impact on the Rural Non-Farm Employment in Bangladesh

Mahtab Uddin

PhD candidate, the University of Manchester

Assistant Professor, Department of Economics, University of Dhaka

Co-authors

Selim Raihan, University of Dhaka, and Abdul Jabbar Sakil, IFPRI

Introduction (1/3)

- Despite robust GDP growth, employment in Bangladesh did not grow at the same pace.
- The GDP grew at over 6 per cent, and employment grew at 2.6 per cent between 2016 and 2022.
- Moreover, not all sectors are creating jobs at the same pace.
- The industry sector grew by 10 per cent per annum, while the agricultural sector grew by only 3 per cent per annum.
- Despite that, more employment was created in the agricultural sector than in the industry. The total employment in the industrial sector declined from 12.4 million in 2016-17 to 11.97 million in 2022-23.

Introduction (2/3)

- Bangladesh is set to graduate from the Least Developed Countries in 2025; the demographic dividend is estimated to pan out from the early 2030s; and the country aspires to become a high-income country by 2041.
- According to the latest labour force survey, in 2022, around 45 per cent of Bangladesh's total employment comes from the agricultural sector.
- With further technological advancement, the labour requirement in the agricultural sector is expected to decrease.
- Most non-agricultural work opportunities are in urban areas where the market is saturated.
- The urban areas in Bangladesh, such as Dhaka and Chattogram, are already overtly populated.
- Migration from the rural agricultural sector to the urban non-agricultural sector cannot be a sustainable solution.

Introduction (3/3)

- Rural non-farm employment diversifies household income and helps in increased rural livelihood and household welfare (Buchenrieder, 2005).
- The focus should be on employment growth in the rural nonagricultural sector, i.e., the non-farm sector.
- However, like the rest of the world, the COVID-19 pandemic adversely affected the development trajectory of Bangladesh. The COVID-19 pandemic could be one of the reasons why employment in the agriculture sector has increased.
- No previous papers investigated the impact of the COVID-19 pandemic on job mobility across sectors (such as farm-to-non-farm) or how the COVID-19 pandemic affected job growth in the rural non-farm sector in Bangladesh.
- Our paper addresses this gap in the literature.

Research objectives

In this paper, using unique nationally representative panel data from 2018 and 2023, we explore:

- (1) What factors help employment growth in the rural non-farm sector? How has the COVID-19 pandemic affected this growth?
- (2) What factors explain rural households' higher engagement in the rural non-farm sector, and how does the COVID-19 pandemic affect it?

Theoretical underpinnings

Theoretical frameworks (1/3)

- **Three strands of theoretical frameworks can be found in literature:**

- 1) **Sustainable livelihood framework:**

- It framework theoretically relates vulnerability management strategies to employment activities.
- “A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base” (Chambers and Conway, 1992).
- It is a qualitative analytical framework. It examines factors (internal/external) in the household that affect its decision to engage in Rural nonfarm employment (Buchenrider and Mollers, 2005).
- *This theory argues, that factors affecting a household’s decision to join rural non-farm employment strongly relate to whether (and to which extent), they have access to the five forms of capital assets, namely natural, physical, human, social, and financial assets (ibid).*

Theoretical frameworks (2/3)

2) The demand-pull/ Distress Push concept:

LEE (1966) coined the term to explain migration dynamics.

Demand pull factors: Factors that affects household's capacity in getting access to better employment opportunities.

Distress push: Factors that push households to engage in poorly paid non-farm jobs to complement or replace insufficient farm incomes

Pull factors: Education, social capital, social network; labour demand, higher wages, infrastructure, Information availability, efficient land and credit market, rural development plans.

Push factors: Insufficient access to land and low productivity, small farm size, generation conflict, large family size, low farm labour productivity, lack of finances from farm investments, Covariate (eg disasters) and idiosyncratic shocks, price shocks.

Theoretical frameworks (3/3)

3) Welfare model of rural-nonfarm employment diversification:

- This model illustrates the labour allocation processes induced by the demand-pull and distress-push dynamics (Sinn and Werding (2001). Higher wages induce labourers to migrate across regions or sectors (Sjastaad (1962), Harris and Todarro (1970))
- The welfare model shows that both the demand-pull and distress-push employment diversification, benefit households.
- It assumes rationality and full information.
- The model hypothesizes that the income generated in the non-farm sector by the household members is added to total household income, and thus household welfare is improved.
- The decision to move depends primarily on the wage differential between the two sectors.
- The process stops when the shifting costs are greater than the wage differential.
- Shifts raise the productivity and average wage rate of those remaining in the agricultural sector reducing the incentive further.

Literature Review (1/3)

- Hossain (2004): landownership, non-fixed assets were negatively associated with non-farm activities. The major determinants of participation in non-farm activities: non-land assets, household members' participation in business activities, and a larger number of workers in the household. Higher levels of education increases the likelihood of engaging in purely non-farm sectors.
- Mahmud (1996): the sectoral shift of the labour force from farm to non-farm was the result of distress adaption to increasing landlessness.
- Ranjan (2009): distress-induced push factors (low level of education and landless earners) were the key determinant factors in driving workers to non-farm employment in Northern India (Uttar Pradesh).
- Jatav and Sen (2013): the rural non-farm employment in India is more distress driven.
- Pandi (2019): the decision to join the non-farm employment are more driven by the Push factors than the pull factors.
- Increase in non-farm employment from 2000 to 2013 was mainly driven by male workers. Female workers are more likely to remain in agricultural activities due to mobility constraints (Sen, Dorosh, and Ahmed, 2021).

Literature Review (2/3)

- Larger households send their male household members to engage in non-farm activities and in their absence, the female members of the households take care of the farm activities. This phenomenon partly explains the feminization of farm activities (Sen et al., 2018).
- Human capital has direct impacts on households' shift from farm to non-farm (Sen et al., 2018).
- International migration was observed to be associated with pure farm households and discourages them from moving to other sectors (Ranjan, 2009).
- Based on a survey in three villages in Bangladesh, Sarker and Mandal (2016) found that education, training, and the number of literate household members increase the likelihood of being employed in the rural non-farm sector. This study also found a negative correlation between a household's distance from the nearest town with rural non-farm employment.

Literature Review (3/3)

- Distance from the nearest town affects households, where non-farm and mixed activities are more concentrated in households nearest to the town compared to the farthest households (Sen, Dorosh, and Ahmed, 2021), (Deichmann, Shilpi, and Vakis, 2009).
- Access to major urban centers was found to be associated with high returns from non-farm activities (Kundu, Sarangi, and Dash (2003)) resulting in higher non-farm participation.
- Increased education, and expansion in financial and physical infrastructure and other developmental activities have caused growth in the Rural Non-farm Sector in India over time (Srivastav and Dubey 2002; Kashyap and Mehta 2007).
- There is a strong correlation between rural farm and non-farm employment growth. Whenever farm employment declines the employment in the rural non-farm employment expands (Bhaumik 2002).
- Economic downturns and unique shocks, like demographic changes, significantly reduce non-farm employment, particularly in non-farm wage employment (Amare and Waibel, 2014)

Data (1/2)

- SANEM conducted a nationally representative survey in 2018 covering 10,500 households based on 500 primary sampling units (PSUs) across Bangladesh.
- The 2018 survey covered sections on education, health, social security, income, livelihoods, migration, remittances, household shocks/coping strategies, and detailed consumption.
- The households were selected using stratified random sampling.
- In 2023: SANEM-GDI attempted to reach all 10,500 households from the 2018 survey. It follows the same sampling framework as the 2018 surveys.
- 2023 questionnaire adds new questions to cover COVID-19 shocks, recent inflationary pressure and coping strategies.
- Trained enumerators visited the households between 1 October and 30 November 2023.

Data (2/2)

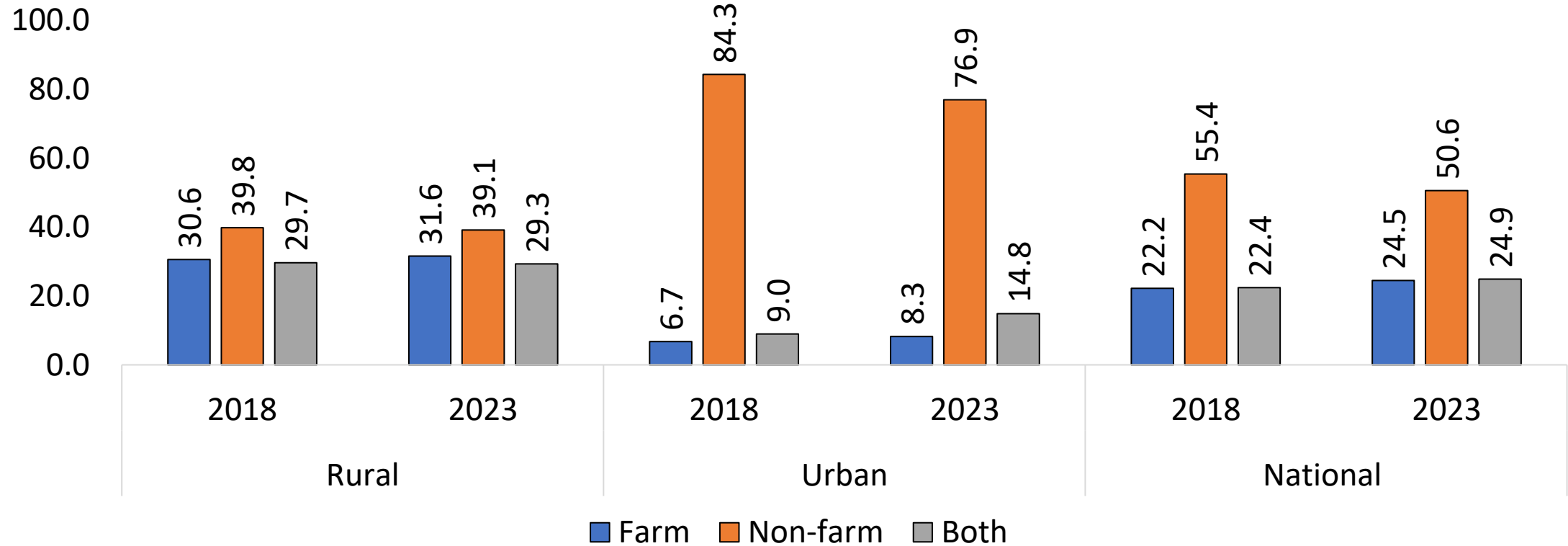
- In 2023, the survey team covered 492 PSUs out of 500 and reached 9,065 households.
- Due to political uncertainties, the survey team could not visit four PSUs. The remaining four PSUs were used for pre-testing.
- The survey team could not locate 13% of the households – mostly in Dhaka and Chattogram city corporations due to shift/migration of the households.
- Among the households found, the non-response rate in the survey is around 1.3%.
- Results are adjusted for attrition biases.
- We also involve qualitative tools (17 Klls and 8 FGDs) to support the quantitative findings

Quantitative survey

Area	PSUs in 2018	Percentage in 2018	Households in 2018	PSUs in 2023	Percentage in 2023	Households in 2023
Rural	325	65%	6,850	317	64.4	6,363
Urban	90	18%	1,678	84	17.1	1,531
City Corporation	85	17%	1,971	91	18.5	1,171
Total	500	100%	10,499	492	100	9,065

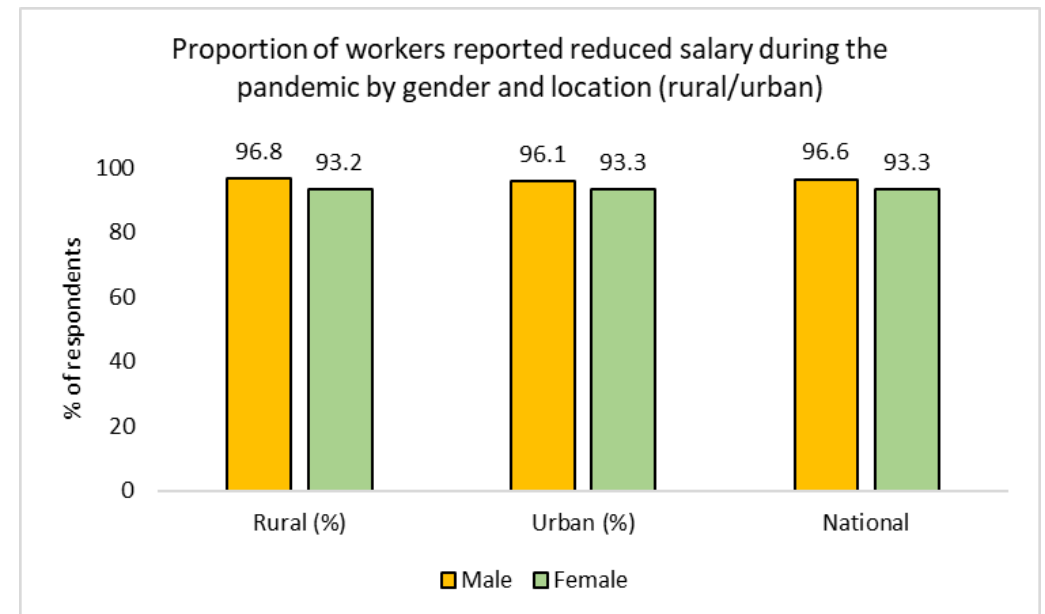
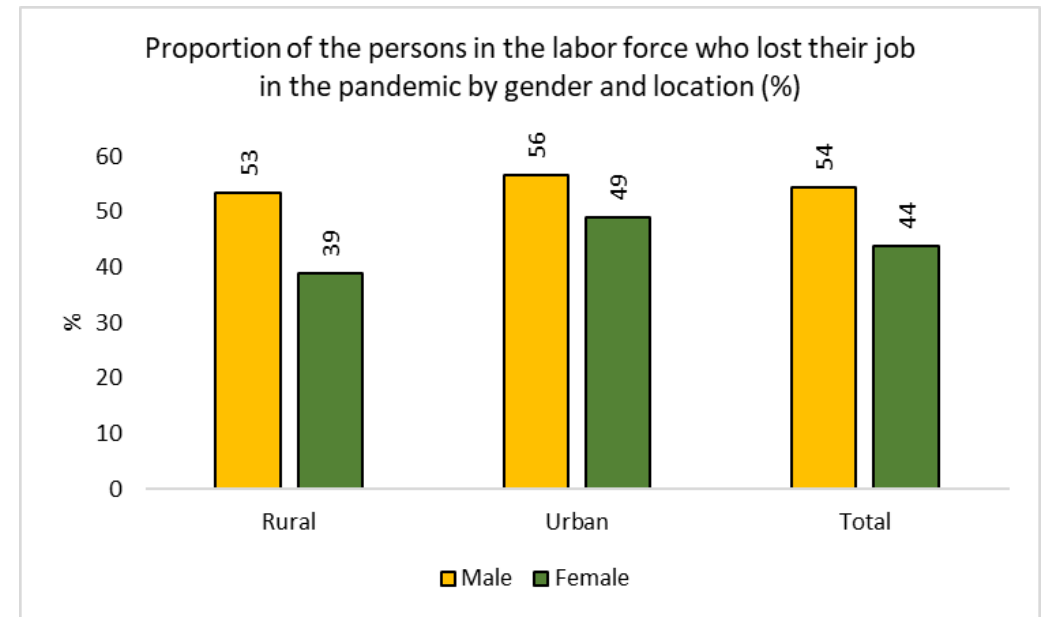
Descriptive Statistics

Percentage of households engaged in farm and non-farm sectors in 2018 and 2023



Job and earning losses during the pandemic

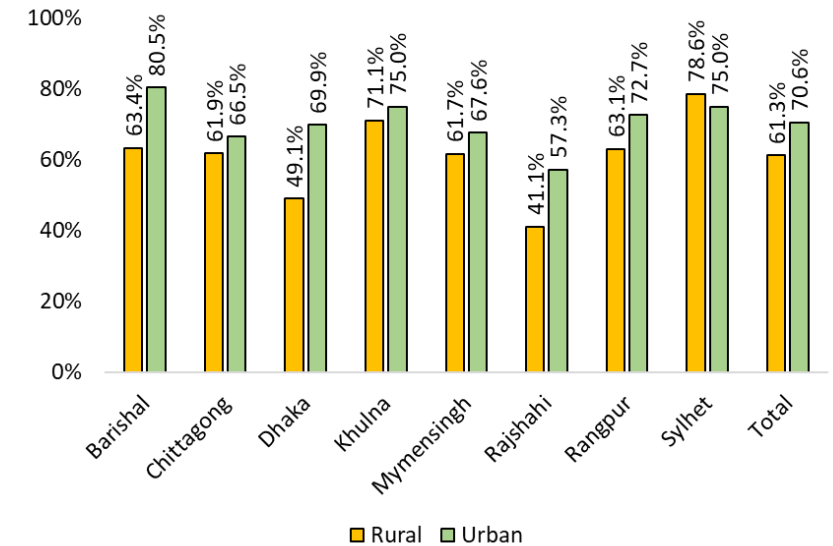
- 54% of the wage employed males lost their jobs during the pandemic, compared to 44% of the females.
- The rates are higher in urban than rural for both males and females.
- Almost all the wage-workers surveyed reported a reduction in salary during the pandemic.



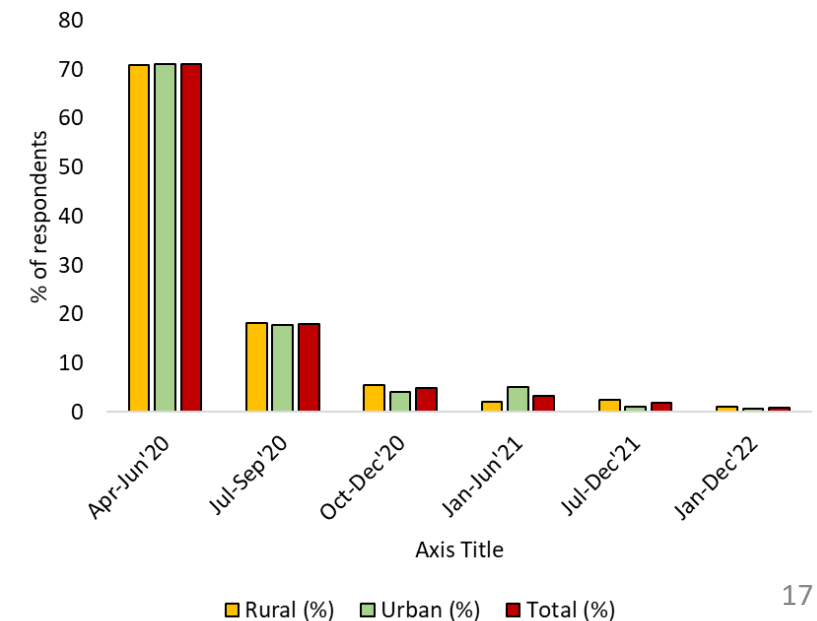
Self-employed (non-agriculture enterprises)

- Majority of the self-employed in non-agricultural enterprises reported business closure during the pandemic.
- The rate is significantly lower in rural than urban.
- The lowest profit or loss incurring month was reported as April-June 2020, the period of first set of lockdown.

Proportion of the self-employed (non-agriculture enterprises) reported business closure any time during the pandemic by locations and divisions

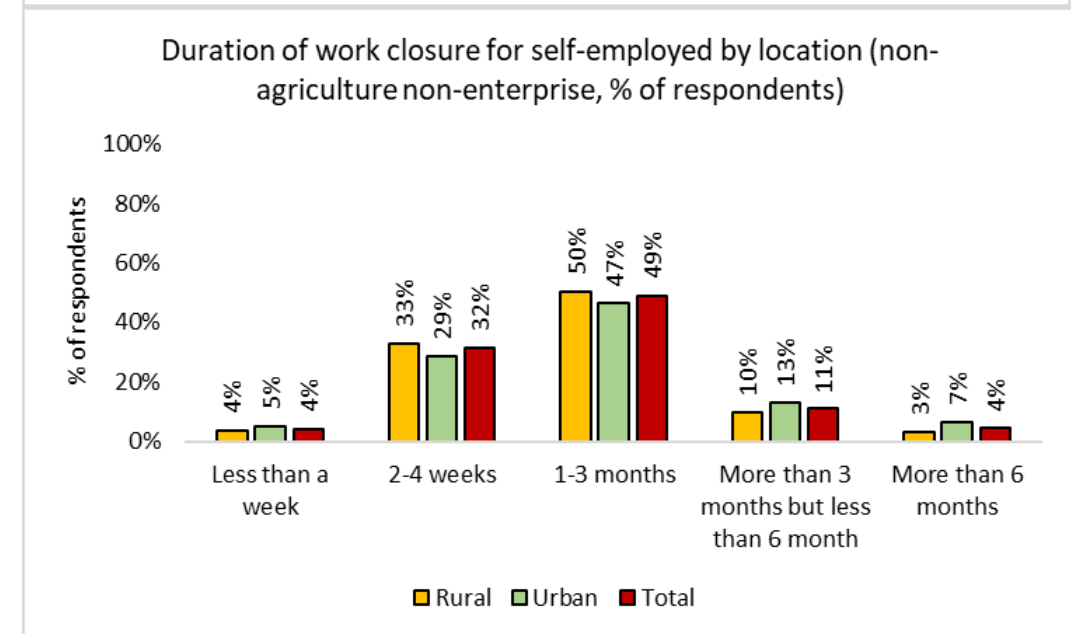
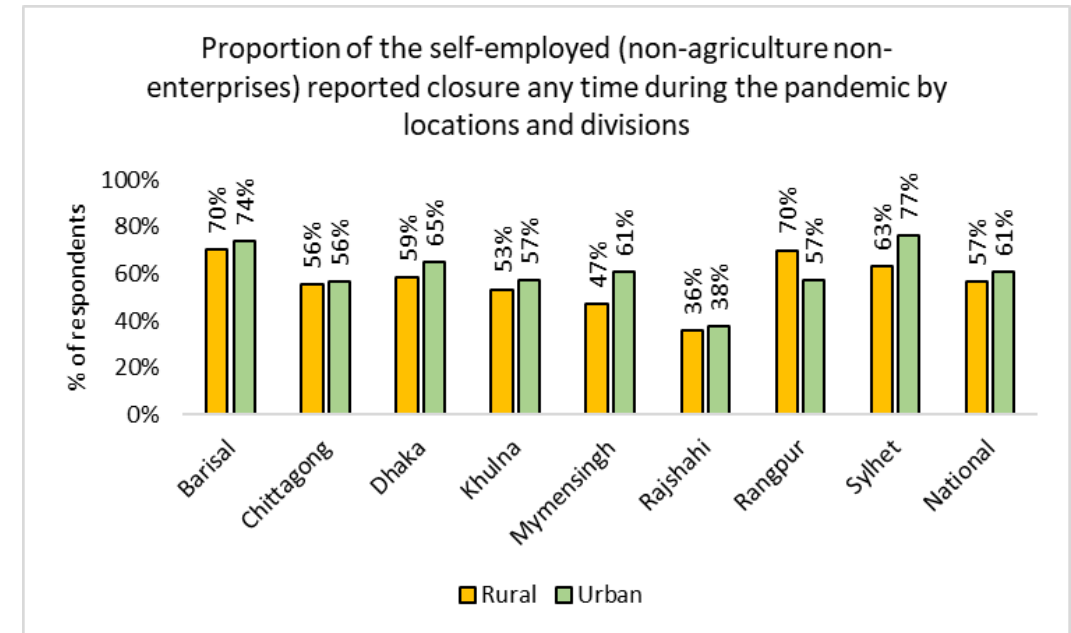


Month of lowest profit by location

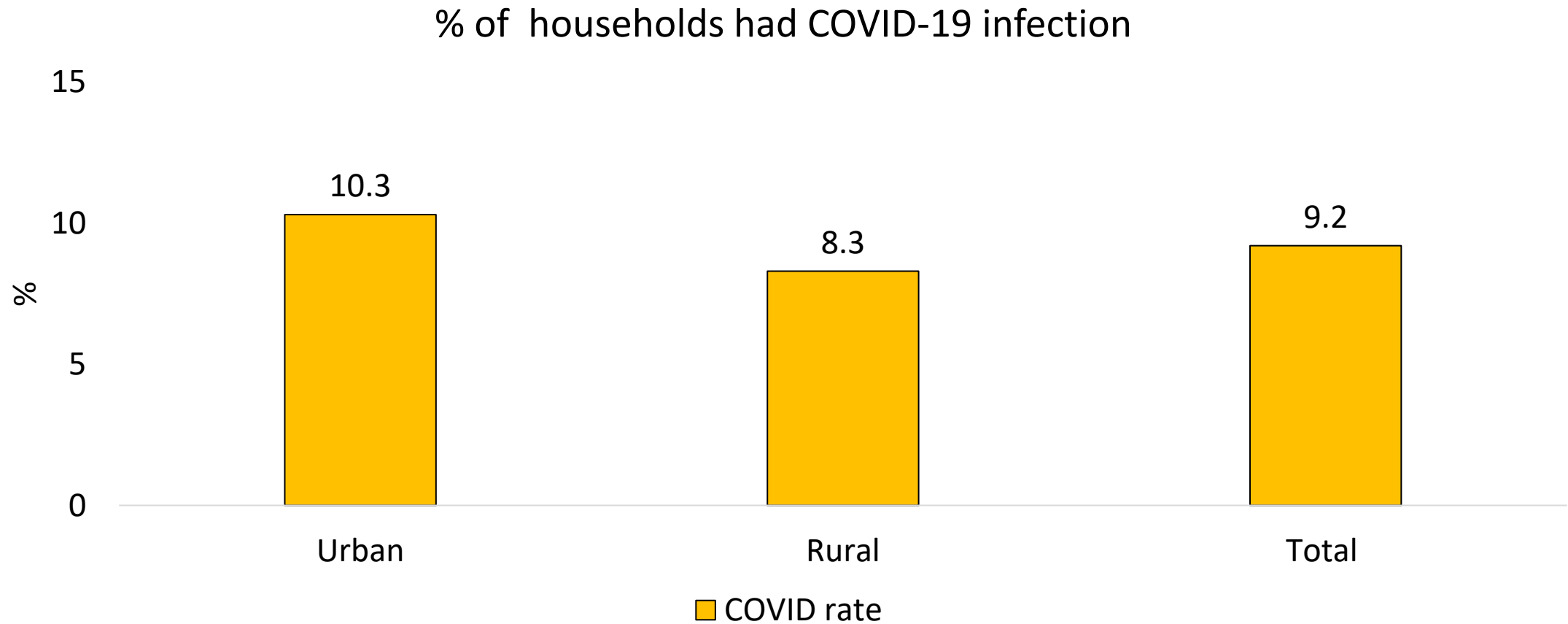


Self-employed (non-agriculture non-enterprises)

- More than 60% of the self-employed (non-agricultural non-enterprises, such as hawkers) reported closure during the pandemic.
- On average, the work was closed between 1-3 months.
- However, more than 10% of such workers reported that they could not work for more than 3 months during the pandemic.

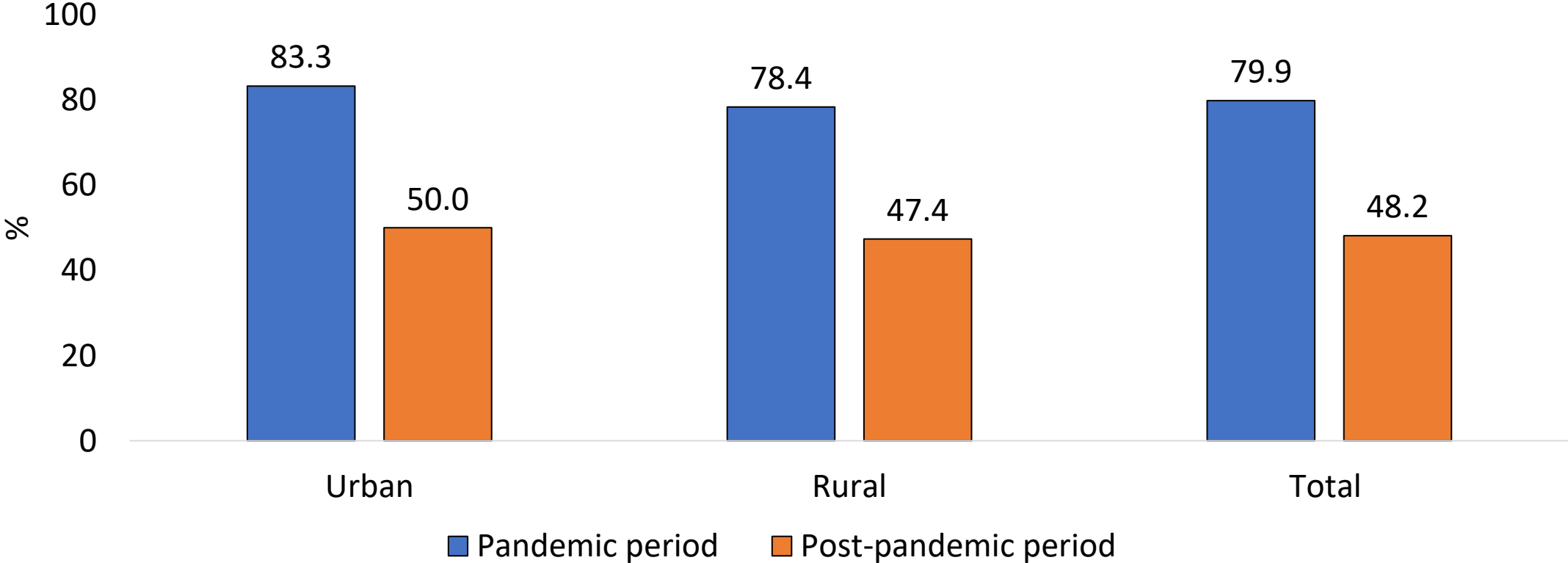


Corona virus rates by regions



Job related challenges faced by the households

% of households faced job related challenges at the PSU level



Empirical Models and Regression Results

Methodology: Model I

Model 1: What factors affect the rural-non-farm growth in Bangladesh?

$$\ln Y_{i,j} = \alpha_i + X'_{ij}\beta + \epsilon_{ij} \quad (1)$$

Where

Y_{ij} = Total non-farm employment in PSU i in district j in 2023.

α_i is the district fixed effects

X is the vector of explanatory variables including the proportion of households faced natural disasters in the PSU, proportion of households faced job related challenges during the pandemic and the post-pandemic periods, the pandemic severity index, etc.

As controls, it includes variables such as change in the mean years of schooling between 2018 and 2023, distance from Dhaka, proportion of households with domestic/international migrants in 2018, etc.

ln(Non-farm employment in 2023)	(1)	(2)	(3)
ln(Non-farm employment in 2018)	0.546*** (0.0720)	0.570*** (0.0692)	0.548*** (0.0699)
ln(Farm employment in 2018)	-0.139*** (0.0504)	-0.125** (0.0508)	-0.133*** (0.0511)
Proportion of affected households by shocks in 2018	-0.000755 (0.00122)	-0.000385 (0.00119)	-0.000758 (0.00119)
Proportion of affected households by shocks in 2023	-0.00367*** (0.00141)	-0.00341** (0.00140)	-0.00392*** (0.00149)
ln(Distance)	-0.0383 (0.0489)	-0.0424 (0.0487)	-0.0333 (0.0480)
Change in MYS between 2018 and 2023 for males	0.0456** (0.0201)	0.0511** (0.0201)	0.0456** (0.0200)
Change in MYS between 2018 and 2023 for females	-0.00370 (0.0204)	-0.000809 (0.0202)	-0.00229 (0.0202)
Percentage of domestic migrants in 2018	-0.00496* (0.00279)	-0.00603** (0.00258)	-0.00615** (0.00269)
Percentage of international migrants in 2018	-0.00219 (0.00180)	-0.00253 (0.00185)	-0.00248 (0.00184)
Ln PSU size in 2023	0.0694*** (0.0116)	0.0657*** (0.0113)	0.0664*** (0.0115)

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

	(1)	(2)	(3)
ln(Non-farm employment in 2023)			
Mean Ln(total borrowed in 2018) at PSU	0.0651*** (0.0180)	0.0665*** (0.0167)	0.0651*** (0.0159)
PSU poverty rate in 2018	-0.00127 (0.00138)	-0.00148 (0.00130)	-0.00166 (0.00132)
Unemployment rate in the PSU 2018	0.00271 (0.00484)	0.00376 (0.00495)	0.00220 (0.00506)
Unemployment rate in the PSU 2023	-0.00977* (0.00499)	-0.00818* (0.00487)	-0.00858* (0.00501)
Percentage of households faced job issues in COVID period	0.00306** (0.00137)		
Percentage of households faced job issues in recovery period	-0.00160* (0.000879)		
Corona-virus rate in the PSU (age>=5)		0.00562*** (0.00138)	
PSU mean of csi			0.00646 (0.00494)
Constant	-0.00694 (0.405)	0.0488 (0.379)	0.0966 (0.387)
R ²	0.704	0.711	0.700
Adjusted R ²	0.608	0.618	0.604
Observations	317	317	317

Methodology: Model II

Model 2: What factors explain rural households' higher engagement in the rural non-farm sector? How does the COVID-19 pandemic affect it?

Suppose,

Y_{it} = number of earners working in the rural non-farm sector in household i in year t

Where, $Y_{it} = \{0,1,2,3,\dots\}$

And $t = 2018, 2023$

let, X_{it} is the vector of exogenous explanatory variables for household i in year t .

Also we assume, α_i as the individual specific fixed effect for household i

Given that Y_{it} is a count data, we assume that it is distributed as :

$$Y_{it} \sim P[\alpha_i \exp(x_{it}^i \beta)] \quad (3)$$

Methodology: Model II

Now, assuming conditional independence, we can write the joint density function for the i th observation $Y_i = (y_{i2018}, y_{i2023})$ as

$$f(Y_i|X_i, \alpha_i, \beta) = \prod_{t=1}^T \exp[-\alpha_i \exp(x_{it}'\beta)] [-\alpha_i \exp(x_{it}'\beta)]^{y_{it}} / y_{it}! \quad (4)$$

Given this, we can measure the effect of the exogenous variables on the household's participation decision in the rural non-farm sector following Poisson fixed effects regression model as mentioned below:

$$\ln(E[Y_{it}|X_{it}]) = \ln \mu_{it} = \alpha_i + X_{it}'\beta$$

Where,

μ_{it} is the mean of the Poisson distribution for household i at year t .

As the key objective variable, we include variables such as % of households lost jobs during the COVID-19 pandemic in the PSU, the COVID-19 job loss during the pandemic, etc. as explanatory variables.

Since, this is only observed in 2023, we include it as *Inter#(year = 2013)* in the regressions.

The regressions control for year fixed effects.

Number of people employed in nonfarm sector in a household

	(1)	(2)	(3)
Household head age	0.00359 (0.00722)	0.00375 (0.00716)	0.00353 (0.00720)
Household head age squared	-0.0000561 (0.0000724)	-0.0000583 (0.0000718)	-0.0000555 (0.0000723)
Household size	0.0918*** (0.0130)	0.0919*** (0.0129)	0.0918*** (0.0130)
Female household head dummy	-0.355*** (0.0596)	-0.353*** (0.0597)	-0.356*** (0.0598)
Household head education level (Base category: no education)	.	.	.
Primary education	0.00855 (0.0288)	0.00763 (0.0288)	0.00806 (0.0288)
Secondary education	0.0145 (0.0394)	0.0143 (0.0393)	0.0137 (0.0394)
SSC/HSC	0.0621 (0.0559)	0.0610 (0.0560)	0.0609 (0.0559)
University education	0.220*** (0.0839)	0.222*** (0.0842)	0.219*** (0.0840)
Number of adult males in the HH	0.327*** (0.0202)	0.328*** (0.0201)	0.327*** (0.0202)
Number of adult females in the HH	0.0262 (0.0231)	0.0249 (0.0231)	0.0263 (0.0231)
Number of kids in the HH below 5	-0.0777*** (0.0176)	-0.0775*** (0.0176)	-0.0777*** (0.0176)
Number of elderly in the HH above 65	-0.119*** (0.0304)	-0.118*** (0.0303)	-0.119*** (0.0304)

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

	(1)	(2)	(3)
Number of people employed in nonfarm sector in a household			
Multidimensional poor (poor=1)	0.0358 (0.0253)	0.0349 (0.0253)	0.0357 (0.0253)
Employment in non-farm (% of total) in the PSU	0.0109*** (0.000991)	0.0109*** (0.000990)	0.0109*** (0.000991)
Unemployment rate in the PSU	-0.00846*** (0.00248)	-0.00802*** (0.00249)	-0.00833*** (0.00248)
Percentage of households faced job issues in COVID period#(year = 2023)	0.00304*** (0.000888)	0.00295*** (0.000888)	0.00282*** (0.000963)
Percentage of households faced job issues in recovery period#(year = 2023)	-0.00186*** (0.000489)	-0.00175*** (0.000492)	-0.00203*** (0.000573)
Ln (total land)	-0.0257*** (0.00613)	-0.0267*** (0.00613)	-0.0263*** (0.00621)
2018bn.year (Year = 2023)	. -0.100* (0.0578)	. -0.116** (0.0581)	. -0.111* (0.0609)
COVID infection rate#(year = 2023)		0.00219** (0.000991)	
PSU mean CSI#(year = 2023)			0.00216 (0.00374)
Observations	9686	9686	9686

Conclusion (1/3)

- The COVID-19 pandemic had multifaceted impacts on the job market.
- However, the impact of the pandemic and the post-pandemic shocks on the rural non-employment have not been studied enough
- In this paper we explore the impact of the COVID-19 pandemic and post-pandemic job-market challenges and their impacts on non-farm employment growth.
- We observe the impact at the PSU and household level.

Conclusion (2/3)

- At the PSU level analysis, we find a positive relationship with male mean years of schooling, lower borrowing constraints, size of the PSU, etc.
- But a negative relationship with the unemployment rate, migration rates, etc.
- Our results show that controlling for all other factors, regions with higher job-market-related challenges in the post-pandemic period had a significant shrink in rural non-farm employment.
- We find a similar result from the individual household-specific regression.
- A positive relationship has been observed with education, household size, number of males in the household, etc.
- A negative relationship is observed with the unemployment rate at the locality, job-related challenges faced during the post-pandemic period, household land holding, etc.

Conclusion (3/3)

- Based on our findings several policy suggestions can be drawn including.
- Non-farm sector is that it is heterogeneous (LANJOUW, 1999) and that is why the policies need to be broad enough.
- Policy makers need to sort out the demand-pull and distress-push factors because of targeting factors.
- Policies needed to increase focus on
- Livelihood capital assets (Financial resources, social capital, physical capital, natural resources, human capital);
- Structure of the public and private sectors and infrastructure, etc;
- and Institution (Gender, Markets).

Annex

Summary statistics (1/2)

Model 1: What factors affect the rural-non-farm growth in Bangladesh?

Variables*	National					Rural				
	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
Ln(Total non-farm employment in 2023)	492	2.79	0.449	0.693	3.761	317	2.728	0.411	1.099	3.555
ln(Non-farm employment in 2018)	492	3.014	0.421	1.609	3.912	317	2.853	0.381	1.609	3.689
ln(Farm employment in 2018)	492	1.908	1.212	0	3.85	317	2.482	0.86	0	3.85
Proportion of affected households by shocks in 2018	492	42.315	29.859	0	100	317	45.095	31.099	0	100
Proportion of affected households by shocks in 2023	492	89.579	17.808	0	100	317	90.724	16.487	0	100
Ln (Distance)	492	4.462	1.199	-0.063	5.876	317	4.75	0.761	0.648	5.876
Rural dummy = 1	492	0.644	0.479	0	1	317	1	0	1	1
Change in MYS between 2018 and 2023 for males	492	0.074	1.289	-4.765	12.364	317	0.22	1.013	-4.765	2.702
Change in MYS between 2018 and 2023 for females	492	0.248	1.12	-3.938	5.688	317	0.388	0.936	-3.206	3.544
Percentage of domestic migrants in 2018	492	3.045	5.661	0	44.444	317	3.857	6.346	0	44.444
Percentage of international migrants in 2018	492	9.776	13.423	0	88.889	317	11.048	14.656	0	88.889
Number of HHs in a PSU in 2023	492	17.815	4.002	1	21	317	19.268	2.177	2	21
Mean Ln(total borrowed in 2018) at PSU	492	9.968	1.631	0	12.163	317	10.17	1.084	0	12.163
PSU poverty rate in 2018	492	22.421	16.406	0	92.857	317	24.733	16.583	0	92.857
Unemployment rate in the PSU 2018	492	3.01	4.006	0	23.529	317	2.534	3.582	0	17.241
Unemployment rate in the PSU 2023	492	3.91	5.168	0	33.333	317	3.543	4.615	0	33.333
Percentage of households faced job issues in COVID period	492	80.084	18.114	0	100	317	78.277	18.395	0	100
Percentage of households faced job issues in recovery period	492	47.594	31.436	0	100	317	46.967	30.452	0	100
Corona-virus rate in the PSU (age>=5)	492	9.974	13.854	0	89.412	317	8.609	11.6	0	89.412
PSU mean of csi	492	17.211	5.669	0.684	34.722	317	17.342	5.116	0.684	30.952

Summary statistics (2/2)

Model 2: What factors explain rural households' higher engagement in the rural non-farm sector? How does the COVID-19 pandemic affect it?

Variable	National					Rural				
	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
Number of family members employed in non-farm sector	18076	0.941	0.825	0	6	12686	0.81	0.775	0	5
Household head age	18128	47.685	12.936	16	107	12726	47.792	13.116	16	107
Household head age squared	18128	2441.229	1301.742	256	11449	12726	2456.065	1322.503	256	11449
Household size	18128	4.241	1.515	1	15	12726	4.251	1.528	1	15
Female household head dummy	18128	0.128	0.334	0	1	12726	0.127	0.333	0	1
Household head education level: No education	18128	0.362	0.481	0	1	12726	0.385	0.487	0	1
Household head education level: Primary education	18128	0.274	0.446	0	1	12726	0.28	0.449	0	1
Household head education level: Secondary	18128	0.209	0.407	0	1	12726	0.196	0.397	0	1
Household head education level: SSC/HSC	18128	0.113	0.317	0	1	12726	0.103	0.304	0	1
Household head education level: University	18128	0.042	0.201	0	1	12726	0.036	0.187	0	1
Number of adult males in the HH	18076	1.352	0.774	0	5	12686	1.335	0.768	0	5
Number of adult females in the HH	18076	1.434	0.669	0	7	12686	1.423	0.658	0	7
Proportion of affected households by shocks	18076	66.217	33.85	0	100	12686	68.15	33.469	0	100
Number of kids in the HH below 5	18128	0.374	0.577	0	5	12726	0.389	0.587	0	4
Number of elderly in the HH above 65	18128	0.176	0.419	0	3	12726	0.184	0.43	0	3
Multidimensional poor (poor=1)	18128	0.272	0.445	0	1	12726	0.308	0.462	0	1
Employment in non-farm (% of total)	18076	68.373	23.569	6.667	100	12686	60.356	21.302	6.667	100
Unemployment rate in the PSU	18076	3.303	4.422	0	33.333	12686	3.013	4.124	0	33.333
Percentage of households faced job issues in COVID period	18128	39.807	41.803	0	100	12726	39.071	41.196	0	100
Percentage of households faced job issues in COVID period	18128	24.017	32.403	0	100	12726	23.626	31.84	0	100
COVID infection rate	18128	4.578	9.667	0	89.412	12726	4.344	9.336	0	89.412
PSU mean CSI	18128	8.65	9.458	0	34.722	12726	8.662	9.382	0	30.952