HOW RURAL FOOD INFLATION IMPACTS RURAL FOOD CONSUMPTION PATTERNS: EVIDENCE FROM 64 DISTRICTS

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Issues of Concern

- The inflation in Bangladesh historically hovered around 5-6% until recently.
- In the last 2/3 years, Bangladesh has entered into a phase of relatively high inflation rate of around 9-10%.
- Although both food and non-food inflation rates have gone up, an interesting dynamic is observed in recent times (i.e., FY2022/23 and FY2023/24) as the growth in food inflation rate surpassed the corresponding growth in non-food inflation rate.
- Notably, increase in both the food inflation rate were higher than the non-food inflation rate in FY2023-24 with the rural districts being hit more than the urban counterparts.
- Consequently, the general consumer price index (CPI)—the so-called “headline inflation” rate has surged during this time.
- Studies also correspond to the “headline inflation” being led by mostly food inflation (Monzur *et. al*, 2013 and Mortaza and Hasnayen 2008).

What We Investigate

- ***What are the consequences of such transition toward high inflation rate regime for the rural population?***

- ***First,*** we estimate rural food inflation from the cost of basic need food bundle (Ravillion and Sen, 1996) and conduct sensitivity analysis to verify the reliability of the estimated food inflation.

- ***Second,*** we see the impact of food inflation on the amount of food consumption of different items for the rural people by comparing our observation from Bangladesh Institute of Development Studies (BIDS) survey data 2023 with the HIES 2022 reported data.

  - We also analyze if there has been any shift within the nutritious bundle items for rural people from different wealth quintiles.

How We Investigate

- Conduct a large-scale rural household survey in the 64 districts of Bangladesh consisting of 3887 households.
- Three Questionnaires: The *household* questionnaire, the *community* questionnaire and the *market pricelist* questionnaire.
- Survey Timeline: Three Months (October 2023-December 2023)

Estimation of Inflation

- Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals.
- Estimating Inflation:
  - Calculation of CPI: To calculate CPI, or Consumer Price Index, a sampling of product prices from a previous year are added together.
  - Then, same is done for the current prices of the same products.
  - Next, we divide the total of current prices by the total old prices, then multiply the result by 100.
  - Finally, to find the percent change in CPI i.e. inflation rate, we subtract 100.

Annual Rural Food Inflation Based on CBN Bundle: 2022-2023

Sl. No.	Items included in the minimum food consumption bundle (Ravallion-Sen)	BIDS Market Price (Tk/KG)		Price Change Rate (Year on Year)	Grams Needed	Value for basic needs Oct-2022	Value for basic needs Oct-2023
		Oct-22	Oct-23	%			
1	Rice	54.65	57.46	5.14	397	21.70	22.81
2	Wheat	50.53	52.38	3.66	40	2.02	2.10
3	Pulses (Masur & Khesari)	88.95	107.38	20.72	40	3.56	4.30
4	Milk (Cow)	56.51	70.81	25.31	58	3.28	4.11
5	Oil (Mustard)	221.33	239.27	8.11	20	4.43	4.79
6	Meat (Beef)	676.33	717.97	6.16	12	8.12	8.62
7	Fish (Fresh Water)	311.85	368.92	18.30	48	14.97	17.71
8	Potato	30.27	52.13	72.22	27	0.82	1.41
9	Other Vegetables (Leafy & Non-Leafy)	49.02	65.70	34.03	150	7.35	9.86
10	Sugar (Gur)	107.3	136.8	27.49	20	2.15	2.74
11	Fruits (Banana)	73.97	96.52	30.49	20	1.48	1.93
Total						69.86	80.35
CPI 2022						100	
CPI 2023						115.01	
Inflation Rate						**15.01**	

Sensitivity Analysis 1: Rural Inflation Rate Using BBS Weights with BIDS Prices

- We re-weight the food items from our household survey food basket with the help of the BBS weights and estimate CPI. The estimations are done for three periods of time- Current month (which is October 2023), Last month (i.e., September 2023) and Last year (i.e., September 2022).
- For the estimation we use the BBS formulated weights (which have been re-weighted for the disaggregated food items from BIDS survey) and obtain weighted average prices.
- Our estimation shows that inflation thus derived for last year stands at 19.94 when calculated through the prices of 12-month recall method and at 17.76 when calculated through the prices of one month recall method.

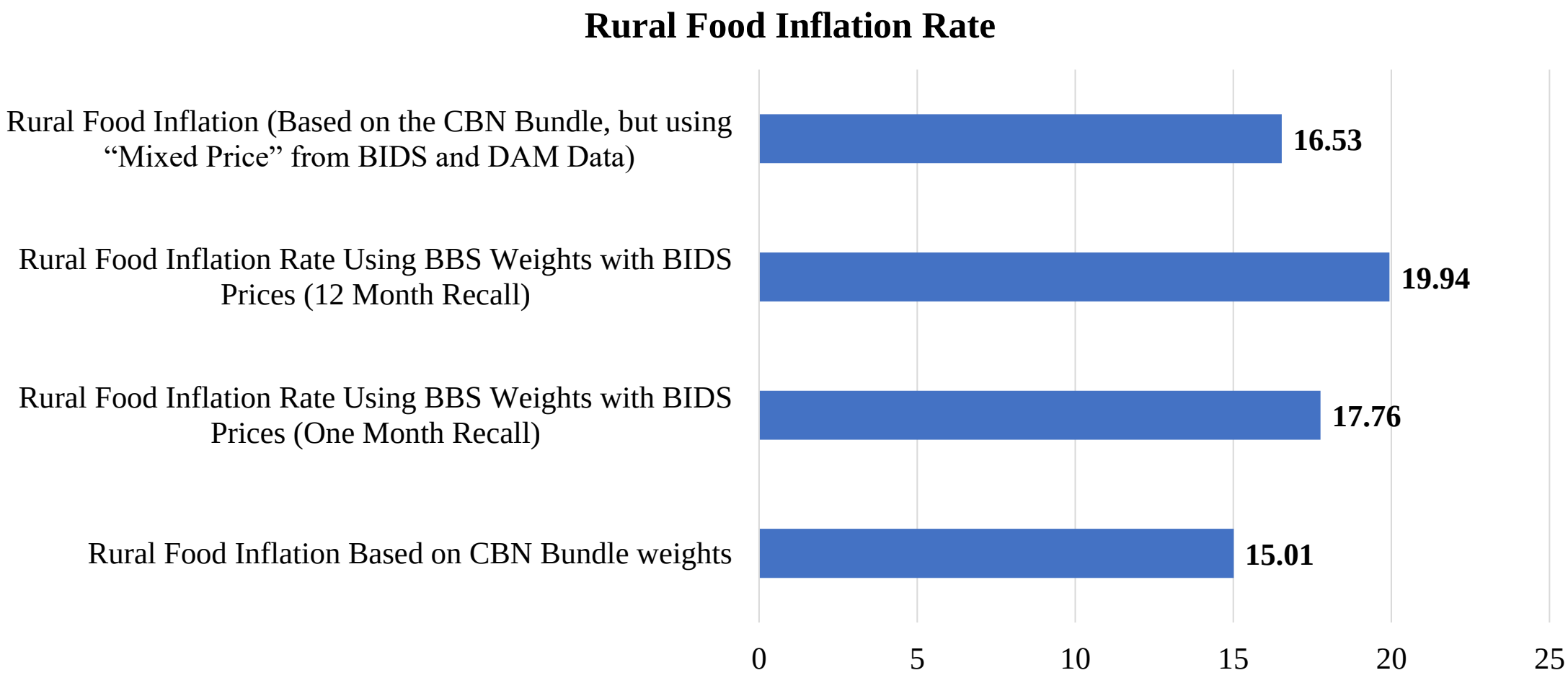
Sensitivity Analysis 1: Rural Inflation Rate Using BBS Weights with BIDS Prices (Continued)

- The relative price changes in this last year
  - Rice: 1 to 5 percent increase,
  - Beef, mutton, poultry, and fish: 6 percent, 11 percent, 15 percent and 27 percent increase respectively.
  - Pulses, eggs, fruits and vegetables: 11 to 23 percent, 24 to 27 percent, 20 to 33 percent, 30 to more than hundred percent (from items like onions and water gourd) respectively.
  - Sugar shows a relative price change of 35 percent in the last year.
  - The price increase for sugar and liquid milk were 35 percent and 25 percent, respectively.

Sensitivity Analysis 2: Rural Food Inflation Based on DAM-BIDS Price Data on CBN Bundle (Mixed Price Method)

Items included in the minimum income bundle (Ravallion-Sen)	**Price in 2022 (Tk per Gram)**	**Price in 2023 (Tk per Gram)**	**Grams Needed**	**Value for basic needs in 2022**	**Value for basic needs in 2023**
Rice	0.042	0.044	397	16.61	17.27
Wheat	0.041	0.046	40	1.65	1.86
Pulses (Masur & Khesari)	0.075	0.082	40	3.00	3.27
Milk (Cow)	0.057*	0.053	58	3.28	3.08
Oil (Mustard)	0.200	0.199	20	4.01	3.98
Meat (Beef)	0.358	0.439	12	4.30	5.26
Fish (Fresh Water)	0.112	0.142	48	5.39	6.80
Potato	0.030*	0.050*	27	0.82	1.35
Other Vegetables (Leafy & Non-Leafy)	0.049*	0.072*	150	7.35	10.74
Sugar (Gur)	0.107*	0.135*	20	2.15	2.71
Fruits (Banana)	0.074*	0.099*	20	1.48	1.97
Total				50.02	58.29
CPI 2022				100	
CPI 2023				116.53	
Inflation Rate				**16.53**	

Estimated Rural Food Inflation: At a Glance



Rural Food Consumption Pattern

- Food consumption has been affected by rising food inflation.
- Consumption of most of the protein-rich items have declined.
- Consumption of rice has increased.
- Average fish consumption has declined, consumption of low-priced fish such as Tilapia and Pangash variety has increased.
  - It seems that the rural consumers are opting for low-priced cereals instead of relatively high-priced animal proteins, and even within the protein category, they are opting for low-priced items.
- There has been a relatively stable egg consumption during this period.
- In contrast, average meat consumption such as beef and mutton has decreased drastically.
- However, farm poultry meat consumption has partially compensated for the fall in meat consumption. As a result, consumption of poultry meat has remained stable during this period.

Rural Food Consumption Pattern: Comparison between HIES 2022 & BIDS 64 District Survey 2023

SL	Food Item	BIDS 2023 (Based on ALL Cases)				HIES 2022	
		Current Per Capita Average Daily Consumption Per Gram (Actual)	Current Per Capita Average Daily Consumption Per Gram (Replace Value Outside of 3SD by District Median)	Current Per Capita Average Daily Consumption Per Gram (Replace Value Outside of 2SD by District Median)	Current Per Capita Average Daily Consumption Per Gram (Replace Value Outside of 1SD by District Median)	Per Capita Average Daily Consumption Per Gram HIES 2022 (National)	Per Capita Average Daily Consumption Per Gram HIES 2022 (Rural)
1	Rice	393.77	395.74	397.87	412.22	328.92	349.12
2	Wheat	18.19	17.97	17.31	16.86	22.92	18.31
3	Other Grains	9.59	9.39	9.2	9.09	33.17	35.59
4	Masur	10.03	9.64	9.46	9.27	11.88	10.42
5	Khesari	0.60	0.61	0.59	0.59	0.45	0.43
6	Other Pulses	2.51	2.51	2.50	2.53	4.81	5.03
7	Potato	50.46	50.32	50.19	50.23	69.7	71.85
8	Leafy Vegetables	32.00	28.28	27.29	27.59	54.44	55.37
9	Onion	22.70	22.76	22.76	22.76	30.16	29.08
11	Fruits	25.71	27.17	26.69	26.59	95.4	90.89

Rural Food Consumption Pattern: Comparison between HIES 2022 & BIDS 64 District Survey 2023 (Continued)

SL	Food Item	BIDS 2023 (Based on ALL Cases)				HIES 2022	
		Current Per Capita Average Daily Consumption Per Gram (Actual)	Current Per Capita Average Daily Consumption Per Gram (Replace Value Outside of 3SD by District Median)	Current Per Capita Average Daily Consumption Per Gram (Replace Value Outside of 2SD by District Median)	Current Per Capita Average Daily Consumption Per Gram (Replace Value Outside of 1SD by District Median)	Per Capita Average Daily Consumption Per Gram HIES 2022 (National)	Per Capita Average Daily Consumption Per Gram HIES 2022 (Rural)
12	Fish	69.72	66.99	66.08	65.81	67.83	67.67
12.1	Rui/Katol	7.11	7.06	6.98	6.87	10.14	8.11
12.2	Pangas	11.75	11.71	11.5	11.81	8.44	9.81
12.3	Telapia	13.09	12.80	12.61	12.48	9.85	10.52
13	Mutton	0.29	0.29	0.29	0.28	1.28	1.23
14	Beef	4.18	4.16	4.06	4.02	11.66	10.25
15	Chicken/Duck	28.67	28.70	28.47	29.37	26.17	22.99
16	Other Meat	0.12	0.06	0.06	0.05	0.94	0.91
17	Eggs	10.72	10.51	10.36	10.36	12.73	10.69

Rural Food Consumption Pattern: Comparison between HIES 2022 & BIDS 64 District Survey 2023 (Continued)

SL	Food Item	BIDS 2023 (Based on ALL Cases)				HIES 2022	
		Current Per Capita Average Daily Consumption Per Gram (Actual)	Current Per Capita Average Daily Consumption Per Gram (Replace Value Outside of 3SD by District Median)	Current Per Capita Average Daily Consumption Per Gram (Replace Value Outside of 2SD by District Median)	Current Per Capita Average Daily Consumption Per Gram (Replace Value Outside of 1SD by District Median)	Per Capita Average Daily Consumption Per Gram HIES 2022 (National)	Per Capita Average Daily Consumption Per Gram HIES 2022 (Rural)
18	Mustard Oil	2.21	2.11	2.03	1.94	2.41	2.62
19	Soyabean Oil	24.87	24.93	24.85	25.19	27.85	26.74
20	Other Edible Oils	0.78	0.78	0.78	0.79	0.59	0.65
21	Sugar	7.30	7.13	6.97	7.39	15.12	15.24
22	Gur	0.66	0.66	0.66	0.67	1.25	1.49
23	Milk	17.01	17.04	17.04	18.28	34.1	32.06

Rural Food Consumption Pattern: Analysis based on Self-Reported Wealth Quintile

- First, consumption of protein-rich animal food items such as beef and mutton are much higher in the richest group compared to the poorest, especially in the time of high inflation.
  - Thus, per capita daily beef consumption has been assessed at 7.4 gm for the richest group in contrast to only 1 gm observed for the poorest group.
  - For the relatively low-priced chicken/ duck item, the difference is less striking: 32 gm for the richest group as opposed to 21 gm for the poorest group.
  - For the egg item, the matched consumption figures are 13 gm and 9 gm, respectively.
- Second, the rich consume more of Rui/ Katol fish (a relatively expensive sweet water fish item) compared to the poor—the corresponding figure for the richest group is 10 gm as opposed to only 5 gm noted for the poorest group.
- Third, the poor however consume more of the relatively low-priced fish item such as Pangas than the rich and it is reflected in the BIDS consumption survey.
  - Thus, the average per capita daily consumption of pangas is 14 gm for the poorest and 12 gm for the poor in contrast to only 8 gm for the richest quintile.
  - The consumption of Telapia is also similar across the wealth quintiles barring the rural richest, which means that there is greater equity in Telapia consumption in rural areas compared to the intake of more expensive fish items.

Rural Food Consumption Pattern: Analysis based on Self-Reported Wealth Quintile (Continued)

- Fourth, the average fruit consumption is also skewed in the BIDS sample: it is as high as 36 gm for the richest compared to 16 gm for the poorest group.
  - It seems that the poor and the poorest severely lag behind in micronutrient consumption compared to the rich. Such gaps possibly increased in the time of high inflation.
- Fifth, it is expected that the cereal consumption will somewhat compensate for the under-consumption of protein-rich items in the income-poor groups.
- It is generally found to be the case, as the rich-poor differences in rice consumption is much less pronounced compared to the differences in non-cereal items.

Rural Food Consumption Pattern: Analysis based on Self-Reported Wealth Quintile (Continued)

- Noteworthy Observation: the average rice and wheat consumption is still positively correlated with the wealth status.
- Thus, the rice consumption for the richest is assessed at 408 gm compared to 382 gm for the poorest.
- Both these figures are higher than the normative 397 gm recommended as the daily calorie norm in the CBN bundle.
- In contrast, wheat consumption is much less than the normative requirement of 40 gm in the CBN bundle (it is only 21 gm for the richest and 12 gm for the poorest).
- This may be explained by the higher prices of wheat in the FY 2023/24.
- For the poorest, one can understand the compensation drive through over-consumption of relatively low-priced rice especially in the face of price rise in other food items.
- But it is difficult to apply the same argument in case of the rich. It is possible that the latter overconsume rice than it is biologically necessary due to poor nutritional education.

Summary of Findings

- Rural food inflation (however measured) has been rising over the period under consideration and must be considered to be in the high range.
- Although weight of the food items in the inflation basket is only 44%, in all likelihood it has contributed the most to the recent rise in the “headline inflation” rate.
- Overall, the change in the rice price is the lowest and the changes in the protein and vegetable items have been more volatile.

Summary of Findings (Continued)

- The rises in the food prices have put pressure on the amount of consumption of the rural people.
- While the consumption of most of the protein-rich items have declined in this period, the consumption of rice has increased contrastingly.
- Also, there is notable decline in average fish consumption and a subsequent shift in the consumption of low-priced fish such as Tilapia and Pangash.
- This explains the relatively stable egg consumption and people’s preference to consume less of the high-priced meat items like beef and mutton and more of the relatively affordable poultry meat.

Summary of Findings (Continued)

- Interestingly, within the wealth quintile, there are some notable influences:

First- the rich consume more of the high-priced protein items than the poor.

Second- the richest among the bunch consume more high-priced fishes like Rui/Katla than the poor.

Third- the poor are now consuming more of the low-priced fishes like Pangas and Telapia.

Fourth- consumption of fruit is also more for the rich than the poor groups in the rural areas.

Fifth- the consumption of cereal across all income and wealth groups has increased and we assume that this is happening because downward shift in protein in the diet basket is being over-compensated through cereal consumption as a whole.

Concluding Remarks

• Food inflation cannot be tackled by conventional demand management alone.

• Emphasis should be given to further studying the market structure of basic food items to rule out any persistent market imperfections and oligopolistic behaviour.

• As noted at the outset, current food inflation rate is mainly driven by rising prices of protein-rich items. Thus, special attention needs to be paid to the production and marketing of these items along with the entire value chain.

Thank You!