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Income-induced effects of COVID-19 on the food consumption pattern of Indian households

S K Srivastava[1]*, and N Sivaramane[2]

[1]ICAR-National Institute of Agricultural Economics and Policy Research, New Delhi 110 012
[2]ICAR-National Academy of Agricultural Research Management, Hyderabad 500 030, Telangana

*Corresponding author: shivendraiari@gmail.com

Abstract The lockdown, imposed nationwide to curb the spread of COVID-19, has disrupted economic activity and adversely affected the income of most households. The level and composition of household consumption is expected to change and create a disequilibrium in the economy through a downward shift in the demand curves of food and non-food items. The consumption pattern is likely to shift from non-essential to essential commodities. The consumption of high-value food commodities will decline comparatively higher than of staple foods. Interventions in the form of direct supplies of essential food items and cash doles will ensure the food security of the poor during the pandemic.

Keywords Consumption, income, expenditure elasticities, COVID-19

JEL codes I31, Q18, D19

Improving economic access to food has always been a priority on the agenda for sustaining food security in India. Household income, a major determinant of access to food, has witnessed consistent progress, and per capita income at the national level (at 2011–12 prices) has increased 5.64 times from INR 16,836 in 1965–66 to INR 94,954 in 2019–20. The level and composition of the food basket has undergone a significant shift over time (Srivastava et al. 2013). The available literature establishes a positive association between income level and food intake, though the marginal effect of income has been reducing over time, and it varies by economic class and geographical location (Radhakrishna and Ravi 1990; Kumar et al. 2011; Srivastava, Balaji, and Kolady 2016). Thus, a change (increase/decrease) in income has direct implications for food security.

The occurrence of the COVID-19 pandemic forced the Indian government to impose a 21-day nationwide lockdown on 24 March 2020 to curb the spread of the virus; the lockdown was extended later. The lockdown disrupted economic activity and adversely affected the income level of most households. This is evident from the 23.9% contraction in the gross domestic product (GDP) at constant (2011–12) prices in Q1 2020–21 (April to June) as compared to the 5.2% growth in Q1 2019–20 (Government of India 2020). The decline in income is expected to lead to a downward shift in the demand curves of food and non-food commodities and, therefore, a disequilibrium in the economy. An assessment of the income-induced change in consumption patterns is essential to understand consumer behaviour during the pandemic and draw implications on demand push measures to revive the economy.

In this context, the paper has examined consumption patterns and modelled consumer behaviour to simulate the likely effect of change in income on the level and composition of consumption expenditure under different scenarios in India. This paper examines the consumption pattern of Indian households; models consumer behaviour and estimates expenditure elasticities for the different food groups and non-food expenses; and constructs possible income scenarios for

the year 2020–21 and simulates the likely effects of income shocks on consumption patterns.

Data and methodology

The study is based on the evidence from the nationally representative Consumer Expenditure Surveys (CES) of the National Sample Survey Office (NSSO). The consumption expenditure on food and non-food items is compared between the 50th (1993–94) and 68th rounds (2011–12) across sectors (rural and urban) and expenditure classes (based on decile values of monthly per capita consumption expenditure (MPCE)). For the temporal comparison of expenditure, values were expressed at constant (1987–88) prices using the consumer price index (CPI) for agricultural labour for the rural sector and the CPI for urban non-manual employees for the urban sector.

The consumption expenditure of a household is allocated among different food and non-food items in such a proportion to fulfil its demand. It is assumed that the household is a utility maximizer and it allocates its budget rationally. Therefore, for modelling consumer behaviour, it is essential to choose a model which satisfies the axiom of choice and which is consistent with the microeconomic theory of utility maximization. The Linear Approximation-Almost Ideal Demand System (LA-AIDS) model is widely used because it satisfies the axiom of choice exactly, and it is relatively easy to estimate and interpret, compatible with aggregation over consumers, and consistent with household budget data (Deaton and Meulbauer 1980; Alston and Chalfant 1993; Eales and Unnevehr 1994). This study uses the LA-AIDS to model consumer behaviour and estimate the expenditure elasticities of food and non-food items; it uses the latest available cross-sectional data of the CES pertaining to the year 2011–12 (68th round). The specification of the model is

$$S_i = a_i + \sum_{j=1}^{n} b_{ij} \ln p_{ij} + C_i \ln Y + d_i IMR + e_i \ln age + f_i \ln hhsize + g_i URBAN + e_i$$

where,

s_i = budget share of i^{th} commodity in total expenditure, i = 1, 2, 3, …..n

$\ln p_{ij}$ = price of j^{th} commodity group in i^{th} equation in logarithmic form,

lnY = MPCE divided by the Stone price index in logarithmic form,

IMR_i= inverse mills ratio with respect to i^{th} commodity,

age_i = age of household head in logarithmic form,

hhsize = household size in logarithmic form

URBAN = dummy for urban sector

Several commodities have a consumption value of zero for several households, due to variations in preference, infrequent purchasing, and/or misreporting (Keen 1986). To overcome the problem of zero observations, the two-step Heckman estimation procedure is used. First, a probit regression model is used to estimate the probability that a given household consumes a given commodity (Heien and Wessells 1990). This regression is used to estimate for each household the inverse Mills ratio (IMR), which is used as an instrument in the LA-AIDS model.

The prices used in the model are 'unit values', derived as the ratio of the expenditure and the quantity of commodities consumed by the household. As it is difficult to derive unit prices for non-food items, a price index for non-food commodities was constructed using the CPI (state-wise separately for rural and urban areas), the Stone price index for food commodities, and household-specific shares of food and non-food expenses in total consumption expenditure as weight. The Stone price index for food commodities is constructed using the formula

$$\ln I = \sum_i \varpi_i \ln p_i$$

where ϖ_i is the mean of the expenditure share of the i^{th} commodity.

To be consistent with microeconomic theory (the consumer is a utility maximizer), certain restrictions were imposed: homogeneity of degree zero in prices and income (i.e., consumers have no money illusion); symmetrical cross elasticities; and additivity (all the budget shares add up to 1). Since the errors of this system of equations tend to be correlated as the samples drawn were almost identical, the seemingly unrelated regression estimation (SURE) model, proposed by Zellner (1962), was used to get efficient estimators of the model. The SURE model employs the feasible generalized least squares technique for estimation. The

expenditure elasticity for i[th] commodity with respect to total food expenditure was estimated by the formula

$$n_i = 1 + \frac{C_i}{\varpi_i}$$

Using the estimated expenditure elasticities, the effect of income-induced change in total consumption expenditure on the level and composition of food and non-food consumption was simulated under three scenarios.

Scenario 1 assumes that the 26.68% decline in the private final consumption expenditure (PFCE) at 2011–12 prices in Q1 2020–21 over Q1 2019–20 will continue for all the subsequent three quarters (Q2, Q3, and Q4) in 2020–21. Thus, the overall decline in PFCE during the year 2020–21 would be 26.68% as compared to 2019–20.

Scenario 2 assumes a gradual recovery, wherein the change in the PFCE in Q2, Q3, and Q4 of 2020–21 would be –15%, –10%, and 0% over the respective quarters in 2019–20 and, in 2020–21, the PFCE will decline 12.54% (weighted average) overall.

Scenario 3 assumes 100% recovery from Q2 onwards, and the remaining quarters in 2020–21 will witness the same level of PFCE as in 2019–20; overall, the PFCE will decline 6.26%. The level and pattern of consumption expenditure during 2019–20, the baseline pre-COVID period, was obtained by inflating the values of 2011–12 CES with CPI.

Results and discussion

Consumption expenditure pattern of Indian households

According to the latest available 2011–12 CES, an average Indian household spends 44.27% of its total consumption expenditure on food and rest is spent on non-food expenses (Table 1).

Between 1993–94 and 2011–12, the average non-food expenditure (at constant prices) increased significantly, at 4.29% annual growth rate, as compared to only a marginal increase in food expenses. Consequently, the share of non-food expenses in total consumption expenditure increased from 37.8% in 1993–94 to 55.7% in 2011–12. A shift in the consumption pattern away from food is an expected phenomenon and is widely observed by several scholars (Kumar 1996; Meenakshi 1996; Rao 2000; Radhakrishna 2005). The consumption pattern varies significantly across rural and urban areas and by expenditure class. Although the absolute value of expenditure (on food and non-food) was relatively higher among urban households, rural households allocated a relatively higher proportion of their consumption expenditure to food in both years. Between 1993–94 and 2011–12, the

Table 1 Trends in consumption expenditure pattern of Indian households (1993–94 to 2011–12)

Year	Real expenditure (at 1987–88 prices)			Share in total expenditure (%)	
	Food	Non-food	Total	Food	Non-food
Rural					
1993–94	103	57	160	64.6	35.4
2011–12	107	113	221	48.6	51.4
CGR (%)	0.21	3.93	1.80	-15.9	15.9
Urban					
1993–94	153	112	265	57.64	42.36
2011–12	154	246	401	38.47	61.53
CGR (%)	0.05	4.47	2.33	-19.2	19.2
Total					
1993–94	116	71	187	62.2	37.8
2011–12	119	150	270	44.3	55.7
CGR (%)	0.16	4.29	2.07	-17.9	17.9

Source Authors' estimates

Table 2 Decile class wise consumption pattern in India in 2011–12 (%)

Items	Decile classes*										
	1	2	3	4	5	6	7	8	9	10	All
Total expenditure (INR/capita/month)	533	711	839	959	1,098	1,260	1,470	1,774	2,311	5,033	1,599
Non-Food	38.7	40.4	42.0	43.3	45.4	46.9	49.3	52.6	56.9	71.3	55.7
Food	61.3	59.6	58.0	56.7	54.6	53.1	50.7	47.4	43.1	28.7	44.3
Cereals	34.6	31.7	29.1	27.4	25.7	24.2	22.9	20.9	19.1	14.8	22.7
Pulses	8.0	7.5	7.5	7.3	6.9	6.8	6.7	6.4	6.0	4.9	6.4
Edible oils	9.3	9.1	8.7	8.4	8.1	8.0	7.8	7.3	6.8	5.5	7.4
Milk	8.1	11.5	14.0	15.9	18.1	19.5	20.2	22.3	23.4	22.2	19.2
Fruits	1.0	1.4	1.6	2.0	2.1	2.5	2.8	3.2	3.8	4.8	3.0
Vegetables	12.9	11.7	11.2	10.7	10.1	9.8	9.7	9.2	8.8	7.4	9.5
Non-veg	5.2	6.5	6.7	7.0	7.3	7.5	7.6	7.8	7.9	7.4	7.3
Other foods[#]	21.0	20.6	21.1	21.4	21.7	21.6	22.3	22.8	24.2	33.0	24.4

Source: Authors' estimates

*based on MPCE; [#] Other foods include dry fruits, beverages, snacks and processed items, cooked meals taken outside home, spices, sugar, and salt

percentage decline in the share of food in total consumption expenditure was relatively less among rural households. These evidences reveal a consistently higher propensity among rural households to consume food. Similarly, the consumption expenditure pattern across decile classes (based on the MPCE) revealed that although the absolute value of food and non-food expenditure increases as household income increases, the share of food in total consumption expenditure decreases (Table 2).

In 2011–12, the households in the bottom decile class allocated 61.3% of their total consumption expenditure to food as compared to only 28.7% by the households in the top decile class. The rising absolute values of expenditure across the successive expenditure classes, along with the relatively higher propensity of rural and poor households for consuming food, implies that raising income, particularly of these households, by providing attractive avenues of earning would have a positive and stronger impact on improving the overall food and nutritional security in the country.

The food basket of an average Indian household is dominated by cereals, followed by milk and milk products. In 2011–12 cereals constituted 22.7% of the total food expenditure and milk 19.2% (Table 2). Interestingly, the composition of the food basket varied by expenditure class: the share of cereals, pulses, edible oils, and vegetables in total food expenditure was higher among households in the lower expenditure classes, and the share of milk, fruits, non-vegetarian products, and other foods (including processed foods, dry fruits, beverages, etc.) was higher among households in the higher expenditure classes. This implies that as an Indian household's income increases, it diversifies its food basket and allocates a relatively higher proportion of its food budget to high-value food commodities such as milk, fruits, non-vegetarian products, etc. A similar relationship has been established in other studies (Carmelia et al. 2019). Conversely, in the situation of a decline in income, a household would tend towards consuming staple foods and making only necessary expenses. Such consumer behaviour has been simulated by estimating the expenditure elasticities of food items and non-food expenses.

Estimation of expenditure elasticities of food groups and non-food expenses

The coefficients of the LA-AIDS model applied on 2011–12 CES data are estimated (Table 3). The model includes the share equations for cereals, pulses, edible oils, milk, fruits, vegetables, non-vegetarian products, and non-food expenses. The coefficients for 'other

Table 3 Estimated parameters of LA-AIDS model using SURE estimation technique

Variables	Cereals	Pulses	Milk	Edible oils	Non-veg	Vegetables	Fruits	Non-food
Dependent variable: Proportion of respective item in total consumption expenditure								
Independent variables:								
Intercept	0.4692	0.0950	0.1902	0.1046	–0.0067	0.1521	0.0021	–0.0100
	(0.0021)	(0.0010)	(0.0036)	(0.0009)	(0.0022)	(0.0014)	(0.0008)	(0.0041)
Prices in logarithmic terms								
Cereals	0.0858	–0.0047	0.0085	–0.0060	–0.0017	–0.0147	–0.0034	0.0106
	(0.0004)	(0.0001)	(0.0002)	(0.0001)	(0.0003)	(0.0002)	(0.0001)	(0.0003)
Pulses	–0.0047	0.0204	–0.0042	–0.0045	0.0025	0.0027	–0.0024	0.0110
	(0.0001)	(0.0003)	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0001)	(0.0002)
Milk	0.0085	–0.0042^{NS}	–0.0008	–0.0018	0.0193	0.0070	–0.0009	–0.0058
	(0.0002)	(0.0001)	(0.0005)	(0.0001)	(0.0003)	(0.0002)	(0.0001)	(0.0004)
Edible oils	–0.0060	–0.0045	–0.0018	0.0341	0.0015	0.0023	–0.0005	0.0024
	(0.0001)	(0.0002)	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0001)	(0.0002)
Non-veg products	–0.0017	0.0025	0.0193	0.0015	–0.0194	–0.0027	–0.0019	0.0019
	(0.0003)	(0.0002)	(0.0003)	(0.0002)	(0.0004)	(0.0002)	(0.0001)	(0.0003)
Vegetables	–0.0147	0.0027	0.0070	0.0023	–0.0027	0.0124	0.0009	0.0099
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0001)	(0.0002)
Fruits	–0.0034	–0.0024	–0.0009	–0.0005	–0.0019	0.0009	0.0039	0.0016
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Other foods	0.0038	–0.0056	–0.0110	–0.0055	0.0028	0.0047	–0.0010	–0.0341
	(0.0003)	(0.0001)	(0.0004)	(0.0001)	(0.0003)	(0.0002)	(0.0001)	(0.0005)
Non-food price index	0.0106	0.0110	–0.0058	0.0024	0.0019	0.0099	0.0016	–0.1102
	(0.0003)	(0.0002)	(0.0004)	(0.0002)	(0.0003)	(0.0002)	(0.0001)	(0.0007)
IMR	-	–0.0152	–0.0104	–0.0220	–0.0023	-	0.0036	-
	-	(0.0002)	(0.0005)	(0.0002)	(0.0003)	-	(0.0001)	-
MPCE_ln	–0.0783	0.0024	–0.0059	0.0007	0.0106	–0.0225	0.0008	0.1127
	(0.0003)	(0.0002)	(0.0008)	(0.0002)	(0.0005)	(0.0002)	(0.0001)	(0.0005)
Age_ln	0.0110	–0.0047	–0.0055	–0.0067	0.0018	0.0031	0.0004	–0.0117
	(0.0005)	(0.0001)	(0.0005)	(0.0001)	(0.0003)	(0.0003)	(0.0001)	(0.0010)
Household size_ln	–0.0008	0.0112	–0.1218	0.0139	0.0518	–0.0126	–0.0034	0.0136
	(0.0003)	(0.0006)	(0.0014)	(0.0005)	(0.0012)	(0.0002)	(0.0004)	(0.0006)
Urban dummy	–0.0288	–0.0004	–0.0018	0.0032	–0.0045	–0.0030	0.0017	0.0285
	(0.0003)	(0.0001)	(0.0005)	(0.0001)	(0.0003)	(0.0002)	(0.0001)	(0.0007)

Source Authors' estimates

NS: Non-significant. All other coefficients were found to be significant at 1% level of significance

foods' were estimated using additivity restriction imposed in the model. Many households reported zero consumption of pulses, milk, edible oils, fruits, and non-vegetarian products. For these commodities, IMRs were estimated and used in the LA-AIDS model as instruments to account for zero consumption bias. The effect of rural and urban areas on consumption pattern in the model was controlled using a dummy variable for urban areas.

The expenditure elasticities of food groups and non-food expenses are estimated (Table 4); these vary by commodity, implying a differential effect of income change on the consumption of different commodities. Among the food groups, cereals exhibited a positive expenditure elasticity value but, at 0.37, it was the lowest. Thus, with a change in income, cereal consumption will change, but only marginally. Edible oils, pulses, and vegetables are relatively more elastic,

Table 4 Likely change in income-induced (due to COVID-19) consumption expenditure during 2020–21

Particulars	Expenditure elasticity	Pre-COVID consumption expenditure (2019–20): INR/capita/month	Change in consumption expenditure during 2020–21**: (%)		
			Scenario 1	Scenario 2	Scenario 3
Cereals	0.37	238	–9.89	–4.65	–2.32
Pulses	0.53	67	–14.05	–6.60	–3.30
Milk	0.89	202	–23.62	–11.10	–5.54
Edible oils	0.42	78	–11.32	–5.32	–2.66
Non-veg	0.96	77	–25.56	–12.02	–6.00
Vegetables	0.58	100	–15.42	–7.25	–3.62
Fruits	1.25	32	–33.43	–15.71	–7.84
Other foods	1.29	256	–34.30	–16.12	–8.05
Food_total	0.80#	1,048	–21.24	–9.99	–4.98
Non-food	1.23	1,318	–32.79	–15.41	–7.69

Source Authors' estimates

**Scenario 1: With same decline in PFCE as during April-June; Scenario 2: With gradual recovery in remaining quarters; Scenario 3: With 100% recovery in remaining quarters

Weighted average (using expenditure as weight) of elasticities of food groups

but in the case of a change in income, their consumption will change less than proportionately. For milk and non-vegetarian products, elasticity values are closer to 1. Fruits and other foods exhibited elastic expenditure elasticities, and a change in household income will change the consumption of these commodities more than proportionately. Overall, the average weighted (with expenditure share) elasticity of food is 0.80 (inelastic), implying that food is a necessary item for consumers. The expenditure elasticity of non-food expenses has been estimated at 1.23; thus, with a change in income, households will change their expenditure on non-food items more than proportionately. These results indicate that the impact of income change on consumption will vary by commodity and elasticity value.

The effect of the pandemic-led income shocks on consumption patterns

The COVID-19 pandemic has severely impacted food consumption: income has decreased; there has been a shift in the variety of food items to cereals; and meal patterns have changed (Tome et al. 2020). The impact was more pronounced due to supply shocks, as labour was not available during the lockdown for harvesting the crops, transport was stalled, and entry was restricted (FAO 2020 a, b, c). The pandemic is likely to have long-run implications on food systems—in the form of structural changes in the supply chain and in food consumption behaviour—but this study focuses mainly on the short-run implications.

The impact pathway (Figure 1) shows the short-run impact of the COVID-19 pandemic on the food consumption of Indian households. The impact was classified based on the uncertainty in income flows and on supply shocks. During the pandemic, income flow uncertainty was very high, ranging from deferred payment to total job loss. Most of the vulnerable people who depend on daily wages lost their jobs during the complete lockdown, and they were only partially reinstated once the lockdown was lifted, because businesses were crippled. While a part of the vulnerable households mitigated the situation by shifting their consumption basket towards cheaper food grains, a large part reduced their food consumption.

Supply shocks also affected food consumption because these restricted physical access to food and raised food prices steeply. Civil society organizations (CSO) and the central and state governments intervened in a major way and helped the vulnerable people to tide over this period through direct cash transfers, provision of food grains and free meals, etc. This study focuses only on the short-run impact on food consumption; it does not cover the extent of benefits through the interventions of governments and CSOs.

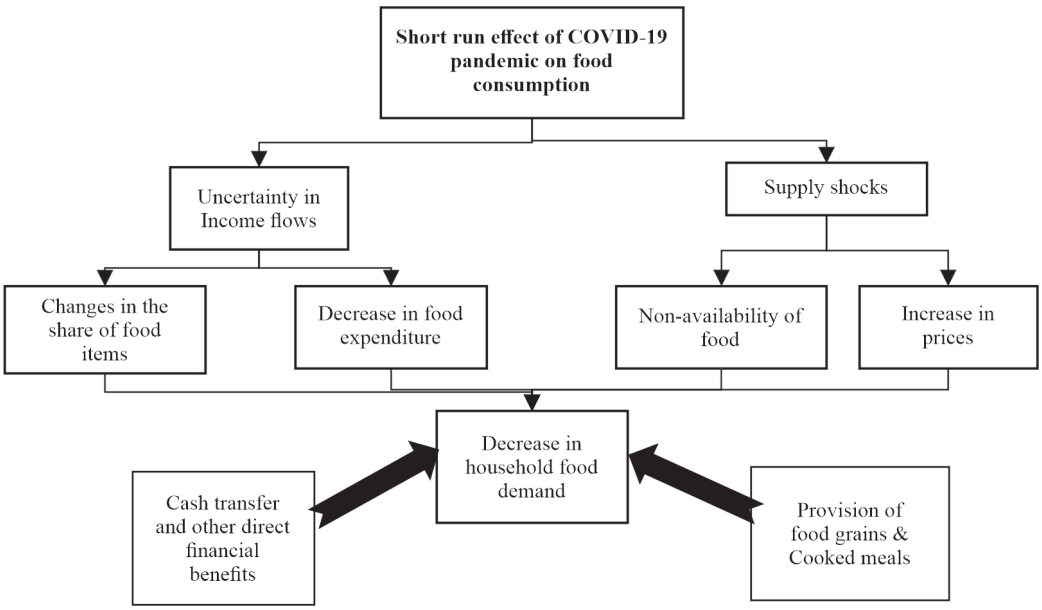

Figure 1 Pathways of likely impact of COVID-19 on food consumption

The average MPCE of INR 1,599 was allocated among various food and non-food items in the year 2011–12. Between 2011–12 and 2019–20, the general price level (CPI) in the country increased by 48% which inflated consumption expenditure to INR 2,366 for maintaining the same level (2011–12) of consumption in the year 2019–20. This was taken as the consumption expenditure in the baseline (pre-COVID) year 2019–20 and allocated to food and non-food items based on the 2011–12 consumption expenditure pattern (Table 4).

The nationwide lockdown disrupted all non-essential economic activity, and the gross value added (at 2011–12 prices) declined 22.8% during the first quarter Q1 (April-June) of 2020–21 as compared to Q1 2019–20 and, consequently, the PFCE declined 26.68%. The likely effect of the pandemic-led decline in income on consumption at the disaggregate level for the whole year 2020–21 is simulated under three scenarios using the estimated expenditure elasticities.

As discussed in the methodology section, overall consumption expenditure for the whole year 2020–21 is expected to decline 26.68% under Scenario 1, 12.54% under Scenario 2, and 6.36% under Scenario 3. As non-food items are relatively more elastic than food items, the decline in the expenditure on non-food items would be relatively steeper than on food. The decline in non-food expenditure is estimated to range between 7.69% and 32.79%, and food expenditure is expected to fall by 4.98% to 21.24% during 2020–21 under the three scenarios considered in this analysis (Table 4).

In absolute terms, per capita monthly non-food expenditure in 2020–21 will be INR 101–432 less than in 2019–20. The decline in absolute per capita monthly food expenditure is expected to range between INR 52 and INR 223. Within the food basket, cereals will witness the lowest decline in consumption (2.32%–9.89%). The decline in the consumption of high-value food commodities such as milk, non-vegetarian products, fruits, and other food products (beverages, dry fruits, processed foods, etc.) will be comparatively higher than staple foods (like cereals, pulses, and edible oils).

A decline in household income will differentially affect the level of consumption expenditure on different commodities, and the composition of the consumption basket is likely to change. Households will reallocate expenditure from non-essential to essential items. The share of non-food expenditure will decline, whereas essential items like food will gain in their share in total expenditure (Table 5). Within the food basket, the share of commodities that have inelastic demand will witness an increase in the food budget.

Table 5 Expected changes in consumption pattern due to COVID-19-led income shock (%)

Items	2019–20	2020–21		
		Scenario 1	Scenario 2	Scenario 3
Cereals	10.0	12.5	11.0	10.5
Pulses	2.8	3.4	3.1	2.9
Milk	8.5	9.0	8.7	8.6
Edible oils	3.3	4.0	3.6	3.4
Non-veg	3.2	3.3	3.3	3.3
Vegetables	4.2	4.9	4.5	4.3
Fruits	1.3	1.2	1.3	1.3
Other foods	10.8	9.8	10.4	10.6
Food_Total	44.3	48.2	45.8	45
Non-food	55.7	51.8	54.2	55.0
Overall	100	100	100	100

Source Authors' estimates

Note Scenario 1: With same decline in PFCE as during April-June
Scenario 2: With gradual recovery in remaining quarters
Scenario 3: With 100% recovery in remaining quarters

Implications of income-induced change in consumption pattern

The reduction in the level and change in the composition of consumption expenditure has definite implications on food and nutritional security and on the revival of the overall economy. In India, many people consume less than the recommended dietary allowance and remain undernourished (Srivastava et al. 2017). The income-induced decline in the level of food consumption is expected to aggravate the incidence of undernourishment in the country.

The reallocation of the food budget from relatively elastic commodities (such as fruits, other foods) to inelastic commodities will reduce the diet diversity and adversely affect the intake of nutrients like vitamins and minerals from these sources unless supplemented with non-food sources (medicines). Thus, the COVID-19-induced income shock is likely to make Indian households, particularly with low earning capacities, more vulnerable to food and nutritional insecurity. The central government has implemented a slew of measures to combat the difficulties faced by vulnerable people. The entitlement of food distributed through the public distribution system was doubled without any additional charges.

To help poor people and migrant workers, the central government instituted several schemes: cash transfers, deferment on interest payment, advancing payment of PM-Kisan scheme instalment, etc. The state governments also came up with several supportive and innovative measures, like cash transfers, in-kind transfer of essential commodities, and providing free meals through food counters. To ensure that food was available to the vulnerable sections of society and they had access to it, CSOs intervened timely in various ways (Press Information Bureau 2020); the effects of such interventions, not accounted in this study, are worth exploring in future research. A reduction in the demand for food and non-food items directly affects food and nutritional security and exerts a deflationary pressure in the economy that may, in turn, lead towards a recession. The strategy to revive economic growth must, therefore, include demand push measures.

Conclusions

Household income has a direct association with the level and composition of consumption expenditure. The evidence reveals that the consumption basket of Indian households is shifting gradually towards non-food expenses, though food still constitutes close to half the consumption expenditure. When income increases, an Indian household diversifies its food basket and allocates a relatively higher proportion of its food budget to high-value food commodities (such as milk, fruits, non-vegetarian products, and processed foods).

Conversely, a decline in income will reduce consumption expenditure, and a household would tend to restrict consumption to food staples and expenses to necessities. The COVID-19 pandemic has adversely affected the income of most households, and it is expected to create a disequilibrium in the economy by shifting the demand curves of food and non-food commodities downwards. This has definite implications for ensuring food and nutritional security and economic growth in the country. The estimated expenditure elasticities revealed that the income change will affect consumption differently by commodity and that it will lead to more than proportionate change in non-food expenses. Food expenses will exhibit inelastic demand and change less than proportionately due to change in income. The response within food commodities will also vary, depending on the elasticity values.

Due to the pandemic-led nationwide lockdown during the first quarter (Q1) of 2020–21, gross value-added declined 22.8% and the PFCE 26.68%. Depending on the trajectory of recovery during the remaining quarters, the decline in income may reduce non-food expenditure during 2020–21 by 7.69% to 32.79%, and food expenditure may fall 4.98% to 21.24%. The decline in the consumption of staple foods (cereals, pulses, and edible oils) will be lower than in high-value commodities (milk, non-vegetarian products, fruits, and other food products such as beverages and processed foods) Consequently, the consumption pattern is likely to shift from non-essential to essential items. The reduction in the level and change in the composition of consumption expenditure may aggravate the incidence of undernourishment and malnourishment and exert a deflationary pressure in the economy. The interventions of governments (central and state) and CSOs through various schemes, supplementary income, and welfare measures are expected to reduce the COVID-19-led income-induced impacts in the economy, and the overall strategy to revive the economy must include demand push measures.

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