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Synopsis: **Diet transformation in Ethiopia**

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Ethiopia's food economy is transforming fast. To better understand this ongoing process, we analyze changes in food consumption that have happened over the period between 1996 and 2011, relying on four rounds of nationally representative household data. The main findings are as follows: First, the share of food in overall expenditures is declining. Second, quantities consumed per capita are increasing. Third, the relative importance of cereals is on the decline. Fourth, there are large differences in the cereal basket of households between rural and urban areas, indicating the importance of increasing urbanization on the food economy. Fifth, cereals – and in particular maize – remain the largest source of calories in the food basket. Sixth, there is a relative shift in consumption to more expensive foods. Seventh, purchased foods are seemingly becoming more important. Finally, there are strong differences in food consumption by income level, but all levels exhibit changes over time. This diet transformation has important implications for the food security debate and for agricultural and food policy in the country.

Introduction

Over the last decade, rapid changes have occurred in Ethiopia's food economy. We explore these changes over this period which is characterized by high economic growth rates, making the country one of the fastest growing economies in the world. To better understand this rapid transformation, the link between food demand, urbanization, and income levels in particular is examined, as this might expose a trend in food consumption patterns, especially within a country where urbanization is encouraged and attaining middle-income status by the year 2025 is described as an objective in several policy documents.

Table 1. Food consumption and real per capita expenditures, by food category, Birr/person/year

	1996		2000		2005		2011	
	Birr	Share (%)	Birr	Share (%)	Birr	Share (%)	Birr	Share (%)
Teff	72	11.5	76	12.9	57	8.9	56	7.5
Wheat	45	7.2	51	8.6	57	8.9	55	7.4
Barley	29	4.7	22	3.8	28	4.4	18	2.4
Maize	63	10.0	64	10.9	55	8.6	58	7.7
Sorghum	45	7.2	37	6.2	52	8.1	37	5.0
Other cereals	18	3.0	19	3.2	11	1.7	11	1.4
Processed cereals	13	2.0	11	1.9	21	3.2	34	4.6
All cereals	*285*	*45.7*	*281*	*47.6*	*281*	*43.8*	*269*	*36.0*
Pulses	48	7.6	57	9.6	50	7.7	71	9.5
Oilseeds	2	0.3	2	0.3	1	0.2	1	0.2
Animal products	47	7.5	45	7.7	56	8.7	81	10.8
Oil & fat	29	4.6	22	3.6	25	3.9	50	6.6
Vegetables & fruits	23	3.7	26	4.3	30	4.6	48	6.4
Pepper	30	4.9	24	4.1	17	2.6	50	6.6
Enset/kocho	32	5.1	45	7.7	29	4.4	31	4.2
Coffee/tea/chat	62	9.9	41	6.9	49	7.7	68	9.1
Root crops	17	2.7	20	3.4	20	3.1	13	1.8
Sugar & salt	15	2.5	12	2.0	12	1.9	20	2.7
Other foods	36	5.7	16	2.7	72	11.3	46	6.2
Total food	*625*	*100.0*	*590*	*100.0*	*643*	*100.0*	*748*	*100.0*
Food versus non-food								
Food	625	51.6	590	62.8	643	54.1	748	47.9
Non-food	585	48.4	349	37.2	546	45.9	812	52.1
Total	*1210*	*100.0*	*939*	*100.0*	*1189*	*100.0*	*1560*	*100.0*

To analyze consumption patterns, we rely on the Ethiopian Household Consumption and Expenditure Survey (HICES) dataset from four past rounds – 1995/96, 1999/00, 2004/05 and 2010/11. These data were collected by the Central Statistical Agency (CSA). In total, 11,678, 17,320, 21,560 and 27,831 households were interviewed over the four survey rounds, respectively.

Findings

1. The share of food in overall expenditures is declining

The share of non-food items in the total consumption basket of Ethiopian households has increased significantly over time. In 2000, the share of non-food consumption expenditures accounted for 37.2 percent of the total. Over the following decade, this type of expenditure grew rapidly, and its share in total household expenditures surged to 52.1 percent in 2011 (Table 1). Such increases of non-food expenditures in total consumption are typical of transforming and improving economies, and imply significant improvements in welfare in the country. This is because greater income gives rise to a shift in people's expenditure from food to non-food products.

2. Quantities of food consumed per capita are increasing

Per capita total quantity of food consumed has increased significantly during the last decade (Table 2). Consumption increased from 247 kg per capita in 1996, to 293 kg in 2000, to 361 kg in 2011, or an increase of 23 percent over the last decade. The quantities of cereals consumed have shown much less growth. Here, consumption of cereals grew from 141 kg per capita in 2000 to 155 kg per capita in 2011, an increase of 10 percent. Consistent with this trend, expenditures on food have grown in real terms in the last two surveys compared to 2000. Per capita food expenditures in 2011 were 19 percent higher than in 2000.

3. The relative importance of cereals is on the decline

Overall, the share of cereals in total household food expenditures is declining. While the share made up 47.5 percent of expenditures in 2000, this had declined to 35.8 percent ten years later. Growth in the non-cereal food share was recorded in a number of categories. Animal products, for example, showed increasing importance

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Table 2. Food consumption, by food category, kg/capita/year

	1996		2000		2005		2011	
	kg	Share (%)	kg	Share (%)	kg	Share (%)	kg	Share (%)
Teff	26	10.5	30	10.3	26	8.0	26	7.3
Wheat	21	8.6	24	8.3	30	9.1	25	6.9
Barley	15	5.9	10	3.3	13	3.9	10	2.7
Maize	34	14.0	37	12.6	38	11.6	51	14.2
Sorghum	18	7.1	22	7.7	32	9.9	28	7.8
Other cereals	9	3.5	14	4.7	5	1.6	7	2.0
Processed cereals	4	1.8	4	1.5	6	2.0	7	2.0
All cereals	*127*	*51.4*	*141*	*48.3*	*150*	*46.2*	*155*	*43.0*
Pulses	20	8.1	16	5.4	17	5.1	18	5.0
Oilseeds	1	0.3	0	0.2	0	0.1	0	0.1
Animal products	14	5.8	12	4.1	15	4.6	17	4.6
Oil & fat	2	0.8	1	0.5	2	0.7	4	1.2
Vegetables & fruits	27	11.0	26	9.0	34	10.5	36	10.0
Pepper	3	1.4	2	0.6	2	0.6	4	1.2
Enset/kocho	12	4.7	56	19.2	41	12.8	47	13.0
Coffee/tea/chat	9	3.7	7	2.5	8	2.5	12	3.4
Root crops	13	5.3	22	7.5	27	8.3	24	6.7
Sugar & salt	7	2.7	5	1.7	5	1.7	8	2.1
Other foods	12	4.7	3	0.9	23	7.0	35	9.7
Total food	*247*	*100.0*	*293*	*100.0*	*324*	*100.0*	*361*	*100.0*

in consumption rates over time. While the share of these products is still relatively low, this has grown from 7.6 percent of food expenditures in 2000 to 10.8 percent in 2011. These patterns reflect Bennett's law that describes a relative decline in starchy staples and an increase in animal proteins with an increase in income. The share of fruits and vegetables also increased over that period, from 4.3 percent to 6.4 percent. Significant positive growth is also seen in the 'oil and fat', 'pepper' and 'coffee/tea/chat' categories. In contrast, we see a decline in the root crops and enset/kocho categories.

Cereal expenditures made up 36.0 percent of the value of the total food consumption basket in 2011 (Table 1) but comprised 43.0 percent of the quantity consumed (Table 2). This indicates that cereals are relatively lower in cost. In contrast, animal products constituted 10.8 percent of expenditures and 4.6 percent of the quantities consumed in 2011. These animal products are the most expensive food items in the consumption basket. The categories 'roots and tubers' and 'enset/kocho' illustrate the opposite pattern, as these are a relative cheap food category.

The most important cereal expenditures are those for teff, wheat, and maize. These crops accounted for 7.5, 7.4, and 7.6 percent, respectively, of food expenditures in 2011. Over time, some minor shifts within the consumption of cereals are observed. For example, the share of expenditures of sorghum in cereal expenditures was 6.3 percent in 2000 and 8.1 percent in 2005, but this declined to 4.9 percent in 2011. Compared to 2000, the share of maize in cereal expenditures has decreased as well. However, in quantity terms, maize is still by far the most important cereal consumed. Within the cereal category, we note the increase of processed cereals, from 1.9 to 4.6 percent of total food expenditures, still relatively low compared to other African countries.

4. Large differences in the cereal basket in urban versus rural areas

The importance of cities is rapidly increasing. While the share of the urban population in Ethiopia is relatively small, the importance of cities, however, has rapidly increased and is expected to further increase in the future. This has likely implications on the food economy as urban residents usually do not grow their own food and tend to have different food baskets.

Average per capita expenditures are significantly higher in urban than in rural areas, and the share of non-food expenditures is also significantly higher in urban (62.3 percent) than in rural (48.8 percent) areas. Interestingly, there are almost no differences in the share of cereals in the food consumption basket, and the quantities of cereals consumed are also at similar levels (Table 3). However, within the cereal category, consumption patterns differ significantly. Rural consumers consume significantly more sorghum (32 kg versus 12 kg) and maize (58 kg versus 18 kg). In contrast, the share of teff in the urban food consumption basket is significantly higher than in rural areas, more than twice as high. Moreover, urban consumers eat 59 kg of teff per year, almost three times the level consumed in rural areas.

Consumption of animal products is significantly higher in urban areas. We also note significant differences in the consumption of enset/kocho which is almost exclusively eaten in rural areas (55 kg per capita on average, compared to 6 kg in urban areas). The root crops are also a more important source of food in rural areas than in urban areas (26 kg and 16 kg per capita in rural and urban areas, respectively).

Table 3. Food consumption in 2011, urban versus rural, by food category, kg/capita/year

	Urban		Rural		Total	
	kg	Share (%)	kg	Share (%)	kg	Share (%)
Teff	59	18.4	20	5.4	26	7.3
Wheat	35	10.9	23	6.2	25	6.9
Barley	4	1.1	11	3.0	10	2.7
Maize	19	5.8	58	15.7	51	14.2
Sorghum	12	3.6	32	8.6	28	7.8
Other cereals	3	1.0	8	2.2	7	2.0
Processed cereals	23	7.0	4	1.1	7	2.0
All cereals	*153*	*47.9*	*156*	*42.2*	*155*	*43.0*
Pulses	18	5.6	18	4.9	18	5.0
Oilseeds	0	0.1	0	0.1	0	0.1
Animal products	19	6.1	16	4.4	17	4.6
Oil & fat	9	2.9	3	0.8	4	1.2
Vegetables & fruits	47	14.8	34	9.2	36	10.0
Pepper	5	1.6	4	1.1	4	1.2
Enset/kocho	6	2.0	55	14.9	47	13.0
Coffee/tea/chat	8	2.5	13	3.6	12	3.4
Root crops	16	5.1	26	7.0	24	6.7
Sugar & salt	11	3.5	7	1.9	8	2.1
Other foods	25	7.9	37	10.0	35	9.7
Total food	*320*	*100.0*	*369*	*100.0*	*361*	*100.0*

5. Cereals, in particular maize, stay the biggest contributor to calorie consumption

Quantities consumed were further converted to calories per adult equivalent using the standard conversion rates from food composition tables for Ethiopia (Table 4). A consistent increase in per capita calorie consumption is seen over the years, reflecting the improving food security situation in the country. Average calorie consumption was only 2,321 kcal per day per adult equivalent in 1996, but this measure reached 3,001 kcal in 2011.

Cereals are the major contributors to total calorie consumption, contributing 61.8 percent of all the calories in the food basket in 2011. While their absolute level of consumption has increased over time, their share in total consumption, however, has decreased from 66.5 percent in 1996. With regard to contribution of calories, maize is the most important source of calories. It accounts for 20 percent of the average calories consumed per adult equivalent. Sorghum accounts for 12 percent and teff and wheat are of equal importance (between 10 and 11 percent). Barley and other cereals are of less importance. While processed cereals ac-

count for almost 5 percent of expenditures, they contribute relatively less towards calories, with 2 percent of calories provided by this category of cereals.

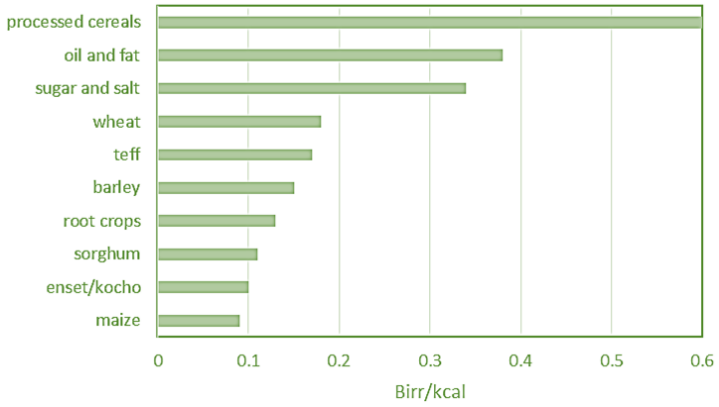
Table 4. Calorie consumption per adult equivalent per day

	1996		2000		2005		2011	
	kcal.	Share (%)	kcal.	Share (%)	kcal.	Share (%)	kcal.	Share (%)
Teff	320	13.8	372	13.6	316	11.1	323	10.8
Wheat	275	11.8	316	11.5	364	12.8	301	10.0
Barley	137	5.9	92	3.4	113	4.0	121	4.0
Maize	455	19.6	490	17.9	441	15.5	608	20.3
Sorghum	227	9.8	289	10.6	363	12.7	353	11.8
Other cereals	77	3.3	169	6.1	63	2.2	91	3.0
Processed cereals	53	2.3	57	2.1	86	3.0	57	1.9
All cereals	*1,544*	*66.5*	*1,785*	*65.1*	*1,745*	*61.3*	*1,854*	*61.8*
Pulses	255	11.0	205	7.5	203	7.1	214	7.1
Oilseeds	11	0.5	7	0.3	7	0.2	5	0.2
Animal products	75	3.2	64	2.3	76	2.7	59	2.0
Oil & fat	57	2.4	39	1.4	63	2.2	130	4.3
Vegetables & fruits	64	2.8	65	2.4	76	2.7	62	2.1
Pepper	10	0.4	5	0.2	5	0.2	52	1.7
Enset/kocho	67	2.9	323	11.8	235	8.2	306	10.2
Coffee/tea/chat	47	2.0	39	1.4	41	1.5	60	2.0
Root crops	71	3.1	122	4.4	149	5.2	104	3.5
Sugar & salt	90	3.9	67	2.4	72	2.5	58	1.9
Other foods	31	1.3	21	0.8	173	6.1	97	3.2
Total food	*2,321*	*100.0*	*2,742*	*100.0*	*2,846*	*100.0*	*3,001*	*100.0*

6. A relative shift in consumption to more expensive foods

Comparing expenditures with calorie consumption allows for the price per calorie of food consumed to be calculated. Figure 1 shows that the average price per calorie differs significantly between food groups. When the prices for 2011 are considered, the prices of cereals are significantly lower than those of almost all other categories. These other categories are therefore usually called "high-value". Animal products carry the highest price for calories with a calorie price that is eight times as high as the average price paid for cereals. The price for fruit and vegetables is also relatively high as it has a price tag that is about five times as high per calorie than for cereals. The price for other foods – except for enset/kocho and root crops – is also significantly higher than the average. Within the cereal category, lowest calorie prices are found for maize and sorghum, which are significantly below those for teff and wheat. Calories from processed cereals have a significantly higher average price.

Figure 1. Real price paid per kilocalorie, 2011

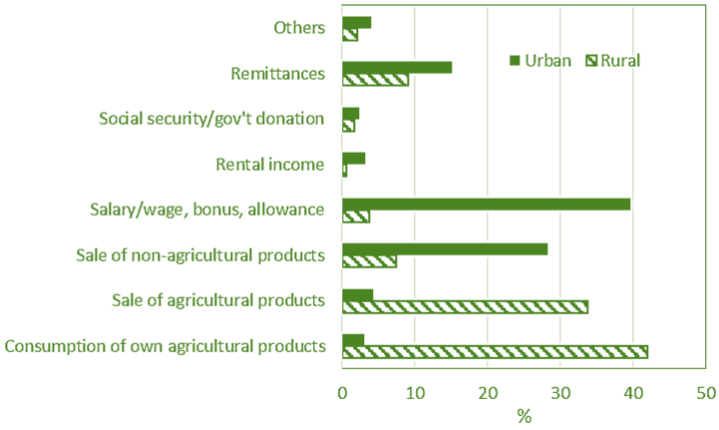


The shift that is seen over time in food preferences shows a reduction in consumption of foods comprising low-priced calories, while there is an increase in consumption of more expensive ones. The average price that consumers pay per calorie has increased by 8 percent over the last decade. This is mostly driven by a shift to more expensive commodities.

7. Purchased foods are becoming more important

The HICES survey required respondents to indicate how they paid for specific foods. The results of these answers are illustrated in Figure 2. We see large differences in source of payment between urban and rural areas. Consumption of own agricultural products accounts for 42 percent of total food expenditures in rural areas. This reflects the high level of subsistence of the rural Ethiopian economy. However, this number is significantly lower than what is usually assumed. 34 percent of food consumed by rural households is paid for through the sales of agricultural products. 76 percent of food expenditures in rural areas are therefore directly paid for by agricultural income, illustrating less importance attached to off-farm income. Remittances, sales of non-agricultural products, and wage income account for 9 percent, 7 percent, and 4 percent, respectively, of total food expenditures in rural areas.

Figure 2. Sources of payments for food, rural and urban, 2011



In urban areas, most food expenditures are paid for by income from wages (40 percent). Second comes the sale of non-agricultural products (28 percent). Remittances make up 15 percent of all food expenditures and apparently are a more important source of income in urban centers than in rural areas. Food expenditures made through "government donation and social security" are relatively less important. They make up 2.3 percent and 1.6 percent of total food expenditures in urban and rural areas, respectively. In rural areas, the share provided by the government seems mostly related to the Productive Safety Net Program (PSNP) as well as by emergency aid, as indicated by the relatively large share of government donations in the case of wheat consumption (5.5 percent) that is paid for that way

8. Strong differences in food consumption by income level, but all income levels exhibit changes over time

A number of food consumption patterns can be distinguished with increasing income and economic development:

- Processed and ready-to-eat foods take off;
- Cereals become less important;
- The share in food consumption baskets of high-value crops, such as fruit and vegetables, dairy and animal products, and fish, increases.

Comparing the differences in consumption patterns of richer and poorer households helps to identify how transformation of food systems will shape food economies. In an effort to understand these patterns in Ethiopia, all households in the HICES survey of 2011 were ranked by wealth quintile, from the poorest quintile 1 to the richest quintile 5. The shares of different consumption categories were then calculated.

Strong differences in the composition of consumption baskets are seen over wealth quintiles. While food expenditures make up 55.0 percent of total consumption expenditures for the poorest quintile, this declines to 38.6 percent for the richest one. The five

Table 5. Share of expenditures by food category, by wealth quintile, 2011

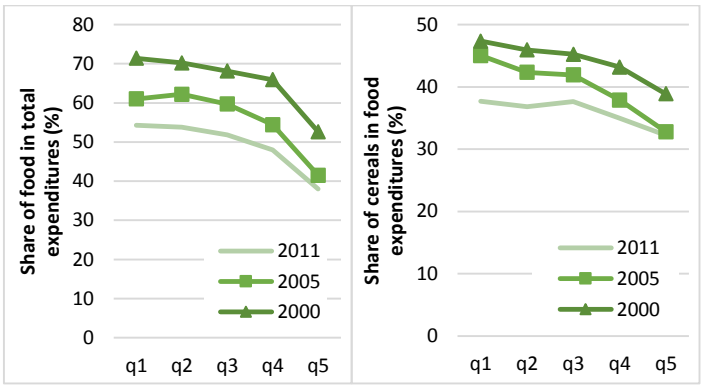
	Q1 (poorest)	Q2	Q3	Q4	Q5 (richest)	Total
Teff	4.4	6.3	7.7	8.5	9.1	7.5
Wheat	6.5	6.9	7.8	7.8	7.6	7.4
Barley	3.4	3.2	2.8	2.1	1.1	2.4
Maize	13.0	10.4	8.8	6.5	2.6	7.7
Sorghum	6.9	6.4	6.3	4.8	1.8	5.0
Other cereals	1.9	2.0	1.6	1.2	0.8	1.4
Processed cereals	2.6	2.6	3.1	4.3	8.9	4.6
All cereals	*38.6*	*37.8*	*38.0*	*35.1*	*32.0*	*36.0*
Pulses	10.1	10.0	10.7	9.7	7.6	9.5
Oilseeds	0.2	0.2	0.2	0.2	0.1	0.2
Animal products	6.6	7.6	8.1	11.4	17.6	10.8
Oil & fat	4.8	6.0	6.1	7.1	8.3	6.6
Vegetables & fruits	6.4	6.4	6.2	6.3	6.7	6.4
Pepper	7.2	7.3	6.9	6.6	5.6	6.6
Enset/kocho	6.4	5.8	4.0	4.2	1.7	4.2
Coffee/tea/chat	9.1	9.5	9.6	9.1	8.2	9.1
Root crops	3.6	2.1	1.6	1.3	1.0	1.8
Sugar & salt	2.4	2.4	2.5	2.9	3.0	2.7
Other foods	4.7	4.9	6.1	6.0	8.3	6.2
Total food	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
Food versus non-food						
Food	55.0	54.6	51.9	48.2	38.6	47.9
Non-food	45.0	45.4	48.1	51.8	61.4	52.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

major cereals make up 34.2 percent of the poorest quintile's food expenditures. This declines to 22.2 percent for the richest quintile (Table 5). Notably, the share is relatively stable for the poorest three quintiles and drops off only for quintiles 4 and 5, suggesting that transformation in the content of food baskets away from cereals only starts to occur as household wealth rises to the levels of the richest two quintiles. Animal foods for the richest households comprises 17.6 percent of the value of their food basket, yet this is only 6.6 percent for the poorest. Overall, the richer consumers become, the more they spent on food and the more food they consume.

Cereal consumption patterns differ considerably by wealth quintile. Maize and sorghum are the cereals that are typically consumed more by the poor than by the rich. 13.0 percent of all food expenditures of households in the poorest quintile is spent on maize. This compares to 2.6 percent of the expenditure of the richest. For sorghum, these numbers are 6.9 and 1.8 percent, respectively. The consumption of barley is low overall, but its share also decreases as wealth increases. There is relatively little variation for wheat consumption across wealth quintiles.

To further explore patterns of food consumption expenditures between wealth quintiles and changes in consumption behavior patterns, the left graph in Figure 3 illustrates how the share of food in the total consumption basket has evolved over time by quintile. The figure illustrates that the reduction in the food share has been consistent over quintiles. While food expenditures made up 71 percent of total expenditures of the poorest quintile in 2000, this decreased to 54 percent in 2011. Similar reductions over time are seen for all quintiles. In the right graph in Figure 3, the share of cereals in food expenditures is shown for the five quintiles over the last three surveys. The share of cereals for the poorest quintile was 47 percent in 2000 but declined to 38 percent in 2011. Again, there has been a consistent decrease of the share of cereals for all quintiles in the consumption basket, even though the average quantities consumed increased over time. Overall, these findings seemingly indicate that economic growth in the last decade in Ethiopia has been equitable and seems to have benefited a majority of the population.

Figure 3. Share of food in total consumption expenditures (left) and share of cereals in food expenditures (right), by wealth quintile, 2000, 2005, and 2011



Source: Authors' calculations based on HICES, CSA

Implications

These findings lead to a number of policy implications. First, agricultural policy in Ethiopia has been successful in improving productivity and availability of cereals in the country, seemingly contributing to improved food security for large parts of the population. However, as shown here, there is still a lack of diversity in diets which seems to be linked to high levels of stunting in the country. More emphasis on diversification in agricultural production as well as on diversification of diets seems required.

Second, agricultural markets play an increasing role in providing consumers with the food that they require. By gaining a better understanding of how these markets might assure adequate, diverse diets, they could help satisfy current needs. This is especially sought given the large distrust that usually exist with respect to these markets. Further understanding of producer, wholesale and retail markets; agricultural processing; trade logistics; and the role of each of these factors in shaping food prices and consumption patterns is required in order to design appropriate policies and interventions to improve diets in Ethiopia.

Third, while there has been significant improvement in the amount and types of calories consumed by average consumers, there is still a significant section of the population that does not have access to an adequate diet. Hence, a further strengthening of targeted safety nets seems essential to improve the food security of deprived people in order to improve their nutrition, health, and well-being.

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