

Food Consumption Patterns in Ethiopia¹

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1. Introduction

1.1. Background

Consumption expenditure is perhaps the most widely used measure of welfare and living standards. It is extensively used in such welfare measures as poverty and inequality. Its widespread usage is ascribed to its desirable attributes over other related welfare measures, such as income and wealth (Richard & Ian, 1995; Deaton, 1997). Current consumption is relatively stable over time and better reflects permanent income compared to current income (Deaton and Zaidi, 2002). It comprises several important dimensions of livelihood including basic necessities and non-basic wants (Hentschel & Lanjouw, 2000). It also shows the state of economic wellbeing that people are actually enjoying than income and wealth. Consumption is considered as a numeraire of economic wellbeing as raising lifetime consumption is the ultimate goal of any economic activity, be it saving or investment.

While consumption may have a number of dimensions, it can be broadly classified into food and non-food components. It has long been posited by the famous Engel's Law in the 19th century that the share of food in the total expenditure declines as the economy grows. The implication of this law is that food consumption might constitute a significant part of the consumption expenditure of poor households in developing countries (Deaton and Zaidi, 2002).

The food component of consumption expenditure has attracted a lot of policy and research attention, particularly in developing countries, not only because it constitutes a great deal of the budget of the poor, but also due to its implication for health and human capital development. The quantity and quality of food consumed by individuals, especially children, critically affects their overall physical and mental development as well as their adulthood human capital outcomes (Alderman, Hoddinott, & Kinsey, 2006; Maluccio et al., 2009; Well, 2007; Victora et al., 2008). Malnutrition is the main source of stunting and wasting in the developing world. Such adverse effects of malnutrition on physical and mental development at some period could persist for generations even after FNS is attained for all people. This condition in turn would lead to intergenerational poverty persistence and low intergenerational social mobility.

Ensuring food and nutrition security (FNS) is one of the main focuses of global, regional and national development initiatives and policies. For instance, the sustainable development goal 2 (SDG2), “Zero Hunger”, intends to directly address FNS. The world Summit on Food Security (WSFS), in an effort to standardize and operationalize the concept of FNS for policy action, defined food security as “[a situation that] exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”. According to this definition FNS stands on four pillars: availability, access, utilization and stability (FAO, 2009).

The definition of WSFS indicates that the concept of FNS security is a complex and multi-dimensional phenomenon that the traditional approach focusing on agricultural production and productivity cannot assure its attainment. Consequently, there is an emerging quest and effort to move to a systems approach of food security that accounts for the multiple dimensions and activities of actors in the food system to enhance understanding and address the issue of FNS (Van Berkum, Dengerink & Ruben, 2018). The systems approach is concerned with the sustainable and holistic management of the integral components of the food system including production, storage and processing, transportation, consumption and disposal of food remains.

1.2. The Situation of Food and Nutrition Security in Ethiopia

Ethiopia has shown dramatic economic growth for last one-and-half decade. Along with this economic growth, the country has achieved considerable progress in reducing malnutrition. Yet, Ethiopia is still one of the countries that are highly affected by malnutrition (Tasic et al., 2020). The 2000 demographic and health survey (DHS) data shows that the percentage of stunted, wasted and underweight children below 5 was 51.5%, 10.5% and 47.2%, respectively (CSA & OCR Macro, 2001). The results from the 2019 mini demographic and health survey (MDHS) also show that while this figures has declined over the period of two decades, the figures standing respectively at 37%, 7% and 21% are still high even by sub Saharan African Standard (EPHI and ICF, 2019; WB, 2019).

Studies also show that the pattern of consumption in general and food consumption in particular in Ethiopia is consistent with Engels’ Law (Berhane et al., 2011). That is poor households spend a larger share of their income on food than richer households. Moreover, the level of dietary diversity in Ethiopia is positively related with level of income that richer households have more diversified diet than their poor counterparts (Wolle et al., 2020).

Despite touted as the water tower of East Africa, Ethiopia has a long history of high vulnerability to drought-induced malnutrition (Alemu & Mengistu, 2019; Dercon, Hoddinott, & Woldehanna, 2005). Food insecurity in Ethiopia could be attributed to multiple factors including low agricultural productivity and production, weak marketing institutions and limited flow of marketing information, lack of transportation and storage infrastructure, unemployment, and low income (FAO, 2009; Shiferaw et al., 2014). Consequently, improving the situation of food security needs a holistic approach that integrates the four pillars of FNS. Indeed the ministry of agriculture has already recognized this situation and has recently coined a motto of “beyond production” to imply that it will be working to resolve not only problems related to production but also marketing and institutional development.

Recently, the state of food security in Ethiopia has deteriorated due to reduction of agricultural production, rising food prices and reduction of wages due to Covid-19 and related restrictions (FAO, 2020). The reduction in agricultural production resulted from desert locust invasion, erratic rainfall, outbreak of measles, cholera and yellow fever. While the economy is struggling to recover from the deleterious effect of Covid-19, the economy has been strangled by a protracted and deadly war in the northern part of the country. The adverse effect of the war on the food insecurity situation of the country has been already evident by large number of people in Tigray region that need food aid and the abnormally high level of food price in the rest of the country. Moreover, the war would also hamper farming activities in the war zone and beyond due to insecurity and loss of productive labour force.

The purpose of this paper is to explore the pattern of food consumption and nutrition in Ethiopia, and lay out the foundation for future policy intervention and rigorous analysis of the drivers of food and nutrition insecurity in Ethiopia.

2. Data and Methodology

The study uses household consumption expenditure survey (HCES) data collected by the Central Statistical Agency (CSA) of Ethiopia. We use the 2010/11 and 2015/16 rounds of HCE. Although the data is not longitudinal, it is rich in that it covers more than 350 food items collected from about 30,000 households randomly drawn from all over the country. The sample households were selected through multi-stage stratified sampling technique in which the country was primarily stratified into nine regional states and two administration regions. Each stratum was further stratified into rural, major urban centers and other urban centers,

which in turn are stratified into enumeration areas (EAs). Finally, 16 households were randomly selected from each selected EA.

The data is analyzed using descriptive statistics such as frequency tabulations, percentages mean and median metrics. The results are presented using tables and graph. The analysis mainly focuses on the patterns of average (per-adult equivalent) individual food consumption and composition of food bundles over time and across different socioeconomic backgrounds. The main food consumption metrics used in this analysis include quantities of different food items consumed per-adult equivalent per day, energy intake per adult-equivalent per day and food consumption expenditure per adult equivalent per day.

Both quantities consumed and expenditure metrics are used to measure food consumption. In this regard, quantity of food that household members consume which is commonly labelled as food energy consumption per capita is computed by dividing each household's average daily consumption by the number of household members. Food consumption per capita (FC_{pc_h}) is defined as the total value of food consumed in the household annually divided by household size. It can be represented as:

$$FC_{pc_h} \approx \frac{1}{N_h} \sum_{i=1}^n C_{hi}$$

Where C_{hi} is value of household h annual consumption of commodity i , N_h if the size of household h . This measure is expressed in monetary terms.

Average daily calorie consumption below the threshold required for a healthy active life is a strong indicator of food insecurity. By the same token, diversity of food that household members consume has been apprehended by the breadth and diversity of consumption bundles, such as starchy staples, animal products, fruits and vegetables, enjoyed by households. Moreover, the share of calories obtained from different food items/ groups is also used as a crude proxy of food diversity.

3. Results

3.1. Components of Household Consumption Expenditure

This section presents the share of main consumption items from household consumption

expenditure. Table 3.1 shows that in 2010/11, consumption expenditure on food was 41.8% followed by housing, water, electricity, gas, and other fuels (24.1%). Clothing and footwear, household equipment and furnishing and enterprise expenditure combined constitutes about 15%. The balance is spent on other several household goods and services. In 2015/16, out of the total household consumption, 46.3% was spent on food, followed by housing, water, electricity, gas, and other fuels (19.6 %). The results show annual household consumption increased from the 2010/11 to 2015/16. However, the pattern of consumption shows little variation, with food remaining the highest consumption item in both periods.

Table 3.1. Components of household consumption expenditure in 2010/11 and 2015/16, (percentage share)

Components of consumption expenditures	2010/11	2015/16	Difference
	A	B	B-A
Food and non - alcoholic beverages	41.8	52.8	4.5
Alcoholic beverages, tobacco and narcotics	2.99	2.91	-0.08
Clothing and footwear	5.15	4.94	-0.21
Housing, water, electricity, gas, and other fuels	24.1	19.6	-4.5
Furnishing, household equipment maintenance	4.60	5.08	0.48
Health	0.88	1.34	0.46
Transport	3.74	2.84	-0.9
Communications	2.45	2.86	0.41
Recreation and culture	0.73	0.49	-0.24
Education	0.95	0.36	-0.59
Restaurants and hotels	0.05	0.02	-0.03
Miscellaneous goods and services	7.3	10.3	3
Household enterprise expenditure	5.02	2.83	-2.19
Total	100	100	4.5

Source: Authors' computation based on HCES, CSA.

While food consumption, as expected, constitutes close to half of the total consumption expenditure, the expenditure on housing, water, electricity, gas, and other fuels has the second largest share. What is surprising is the share of food consumption increased by about 4% from 2010/11 to 2015/16 but that of housing and utility expenditure declined by about the same amount. Given the high level of economic growth rate that Ethiopia has registered in the last a decade and half period, such a rise of the share of food expenditure and fall of

the share of housing and utility expenditure seems to counter the established Engle's Law explained above. While the actual causes of this dynamics have to be investigated using rigorous causal analyses, potential candidates may include rising food prices and house rents, and growing inequalities.

3.2. Pattern of Quantity Consumed by Selected Food Items (Quantity)

Cereal is the most widely consumed food group in Ethiopia. Generally the most widely consumed cereal crops in Ethiopia are teff, wheat, maize and sorghum in their decreasing order of importance. Teff, an endemic Ethiopian staple crop, is the most important cereal crop. On average an adult person consumes about 57 kg of teff per year in 2010/11, which grew by 11% to 63 kg in 2015/16. Teff constitutes more than 10 per cent of the food consumption of households in Ethiopia. Wheat and Maize are the second most important staple cereals in Ethiopia, accounting for about 11% and 10% of food consumption in 2015/16, respectively. While the food share of wheat grew by about 11%, that of maize declined by about 8%. Sorghum, another major cereal consumed by Ethiopians, accounts for about 6% and 5% of the food consumption share in 2010/11 and 2015/16, respectively. Although the level of rice consumption is small, the amount of quantity consumed increased by about 86% from 2010/11 to 2015/16.

Tuber crops such as potatoes and enset are also widely consumed crops in Ethiopia. Enset is used as a staple crop mainly in the southern part of Ethiopia. While enset constitutes about 5% of the overall food consumption in Ethiopia, potatoes and other tubers accounts for about 7% of the national food consumption in 2015/16. Compared to 2010/11, the consumption of enset declined by 14.5% but that of Potatoes increase by 30%.

Oil and fats are also important sources of energy in Ethiopia, as everywhere else. In 2010/11 an adult Ethiopian, on average, consumed 9 kg of oil and fat. This level was increased by 38.6% to 12.7 kg in 2015/16. Ethiopians also consume small amount of oil seeds. An adult Ethiopian consumed 0.36 kg of oil seeds in 2010/11, which declined by 50% to 0.18 kg in 2015/16.

Table 3.2 Quantities Consumed of Major Food Items in Kg per Adult-Equivalent

	Quantity consumed (kg) in 2010/11	Share (%)	Quantity Consumed (kg) in 2015/16	Share (%)	Change	
	A	B	C	D	C-A	100*(C-A)/A
Teff	57.19	13.79	63.26	14.21	6.07	10.61
Wheat	44.19	10.65	48.95	11.00	4.76	10.77
Maize	46.98	11.33	43.14	9.69	-3.85	-8.19
Sorghum	26.42	6.37	21.30	4.79	-5.12	-19.38
Barley	6.93	1.67	6.38	1.43	-0.56	-8.08
Rice	3.06	0.74	5.69	1.28	2.63	85.95
Millet	3.00	0.72	2.50	0.56	-0.50	-16.67
Legumes	19.05	4.59	17.76	3.99	-1.29	-6.77
dairy product	19.49	4.70	17.90	4.02	-1.59	-8.16
Oil seeds	0.36	0.09	0.18	0.04	-0.18	-50.00
Enset	27.34	6.59	23.40	5.26	-3.94	-14.41
potatoes and tubers	25.26	6.09	32.84	7.38	7.58	30.01
Meat	10.62	2.56	9.49	2.13	-1.13	-10.64
Egg	0.59	0.14	0.90	0.20	0.31	52.54
Oil and fat	9.14	2.20	12.67	2.85	3.53	38.62
Vegetables	49.44	11.92	68.38	15.36	18.94	38.31
Fruits	5.07	1.22	6.57	1.48	1.50	29.59
Spice	5.52	1.33	4.60	1.03	-0.92	-16.67
Coffee, tea and chat	12.99	3.13	7.48	1.68	-5.51	-42.42
Non-alcoholic beverages	7.64	1.84	12.81	2.88	5.16	67.54
Purchased prepared foods	16.74	4.04	20.62	4.63	3.87	23.12
Other crops and foods	17.76	4.28	18.32	4.12	0.56	3.15

Source: Authors' computation based on HCES, CSA.

Pulses are the main sources of protein in Ethiopia. The annual per adult equivalent consumption of pulses in 2010/11 was 19 kg which was almost double of the meat consumption of 10 kg in the same year. The consumption of both pulses and meat declined by respectively about 7% and 11% in 2015/16. Meat consumption in Ethiopia is much less than the developing countries average of 31.6 kg in 2015². On average, an Ethiopian adult also consumed 0.56 kg and 0.9 kg of egg in 2010/11 and 2015/16, respectively. The reduction of meat and pulse consumption, which might lead to loss of protein nutrient that may not be compensated by an increase in a half kilo of egg consumption, would be a source of concern. The consumption of dairy products, another important source of protein, energy and micro

² Bruinsma, J. (Ed.). (2003)

nutrients that is important for brain and body development, declined between 2010/11 and 2015/16. In the former year, the national per adult equivalent consumption of dairy products was 19.5 kg which declined to 18kg in 2015/16. Dairy consumption in Ethiopia is also much less than the developing countries average of 55 kg and Sub Saharan average of 31 kg in 2015. Such low level of animal product consumption despite having the largest number of livestock in Africa is an indication of the underdevelopment of the livestock sector of the country.

Table 3.2 shows that the consumption of vegetables and fruits increased between 2010/11 and 2015/16. The per-adult-equivalent consumption of fruits and vegetable were about 5 kg and 49 kg, which increased to 68 kg and 6.5 kg in 2015/16, respectively. Vegetables and fruits are important sources of vitamins as well as minerals that diet cannot be complete without them. The quantity of fruit and vegetable consumption in Ethiopia is less than the sub Saharan African average³. In comparison with WHO recommendations of vegetable and fruits consumption, which is around 400g per day per person (146 kg per adult equivalent per year)⁴, the average Ethiopian adult fails to meet the recommendation. This gives a right signal for the evidence that the largest proportions of Ethiopians are inadequately using the services of these relatively cheap sources of essential micronutrients and protective against chronic diseases.

3.3. Regional Distribution of Food Consumption Items

The results in Table 3.3 show that there is considerable variation in consumption items across regions. Teff is the dominant cereal crop in Addis Ababa, with the annual per-adult-equivalent consumption exceeding that of Oromia, the second teff consumer, by 44 Kg. Teff consumption is the lowest in Somali region. Wheat is widely consumed in the eastern parts of Ethiopia including Somali, Dire Dawa, Afar and Harari regions. Maize is predominantly consumed in Gambella and SNNP regions. Sorghum is mainly consumed in Harari, Benishangul-Gumuz, Tigray and Dire Dawa regions. Rice is also consumed in Somali, Dire Dawa and Harari regions. The results confirm the fact that enset is the dominant staple crop in SNNP region. Potatoes and tubers are also more frequently consumed in SNNP region than any other region of the country.

³ Mensah et al. 2021

⁴ World Bank .2015. Ethiopia Poverty Assessment 2014. Poverty Global Practice African Region.

The results in Table 3.3 further show that the average consumption of meat is the highest in Tigray region, followed by that of SNNP, Addis Ababa and Amhara regions. The lowest average meat consumption is observed in Dire Dawa and Afar regions. The highest and lowest average egg consumptions are observed in Addis Ababa and Somali regions, respectively. While Afar, Gambella and Somali regions, in their decreasing orders, are the main consumers of dairy products, Amhara, Tigray and Benishangul-gumuz are the lowest consumers. Legumes and pulses are mainly consumed in Benishangul-Gumuz and Amhara regions. On the other hand, Somali, Harari and Dire Dawa are the lowest consumers of legumes and pulses.

Table 3.3 Regional Distribution of Food Consumption Items

Food Items	Tigray	Afar	Amhara	Oromiya	Somali	Benishangul Gumuz	SNNP	Gambella	Harari	Addis Ababa	Dire Daw	St.Dev.
Teff	59	39	64	74	7	41	58	51	40	118	36	28
Wheat	49	92	36	44	101	22	34	48	70	47	99	28
Maize	16	57	20	50	23	43	75	151	32	1	31	41
Barley	14	1	8	12	1	1	5	1	1	2	1	5
Millet	2	0	5	4	0	18	0	0	0	0	0	5
Sorghum	52	4	30	19	22	56	5	14	77	0	49	25
Rice	1	5	1	2	39	3	2	4	15	3	17	11
Oil Seeds	0	0	0	0	0	1	0	0	1	0	0	0
Enset	0	0	0	22	0	0	102	7	0	1	0	30
Potatoes and Tuber	6	5	28	30	8	18	86	13	29	23	19	22
Legumes	18	12	23	19	6	27	18	13	8	20	9	7
Meat	14	5	10	8	6	6	12	7	6	12	4	3
Egg	0.94	0.43	0.58	0.96	0.14	0.54	0.99	0.56	0.88	1.91	0.80	0.45
Dairy Products	7	64	6	17	44	7	13	48	30	9	15	20
Oil and Fat	8	9	11	14	15	12	11	12	13	17	17	3
Vegetables	39	34	39	74	33	55	112	92	61	79	68	26
Fruits	12	2	4	6	3	10	9	12	4	6	3	4
Spices	5	4	5	5	2	4	5	3	2	7	2	2
Coffe, Tea and Chat	4	5	5	11	2	9	13	8	4	5	2	4
Purchased Prepared Food	23	21	26	21	6	24	15	23	29	26	20	6
Non-Alcoholic Drinks	3	212	2	3	5	2	5	6	10	4	9	62
Alcoholic Drinks	129	24	166	69	45	135	69	46	152	20	93	52

Source: Authors' Computation based on HCES, 2015/16

SNNP region is the main consumer of vegetables with an average annual consumption of 112 kg per-adult-equivalent. Other major consumers of vegetables include Gambella, Addis Ababa and Oromia. The largest consumers of fruits are Tigray, Gambella, Benishangul-Gumuz and SNNP regions in descending order.

3.4. Household Food Energy Consumption (FEC)

The total energy content of the food consumed by households was calculated by multiplying the quantities of the edible portion of different food items consumed by energy conversion factors. The essence of this section mainly focuses on the dynamics of daily food energy consumption per adult equivalent⁵, which is calculated by dividing each household's daily caloric consumption by the adult equivalence of household size.⁶ The national level mean energy consumption in 2015/16 was 3162 Kcal per adult equivalent. Given the considerable socioeconomic and geographical diversity in Ethiopia, there might be a non-trivial variation in the level of energy intake in different regions of the country. In what follows, we will describe the distribution of energy consumption across geographical locations and socioeconomic characteristics.

3.4.1. Distribution of Energy Consumption by Region

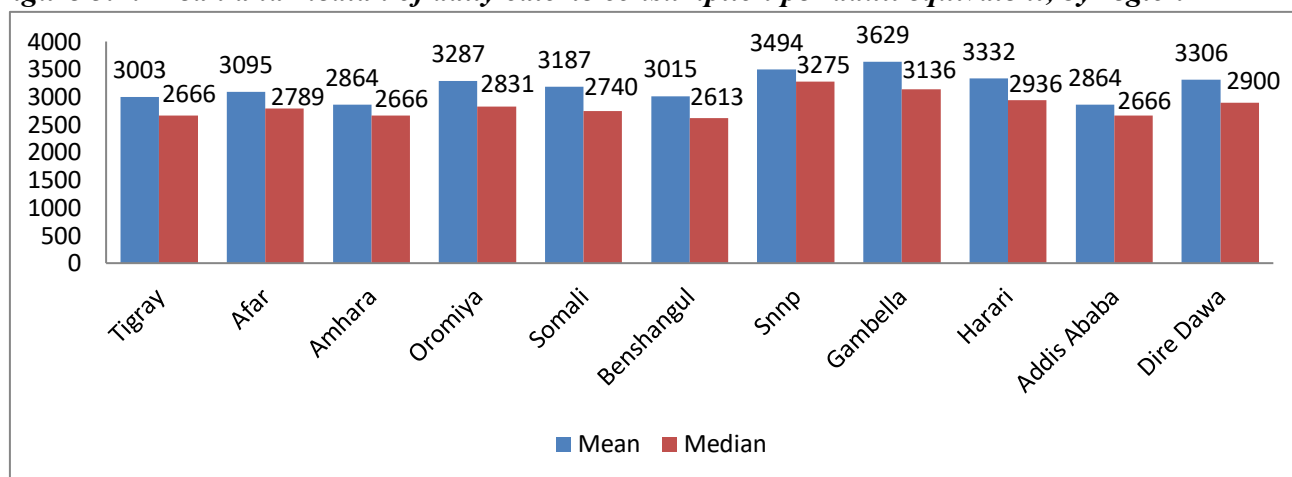
Figure 3.1 below illustrates the mean and median daily calorie consumption per adult equivalent across administrative regions. Oromia, SNNPR, Gambella, Diredawa and Harari have the highest average food energy consumption per adult equivalent that is far above the average national per adult equivalent. The average daily energy consumption in Amhara, Tigray, Beneshangul-Gumuz, and Addis Ababa fall substantially below the national level average. Furthermore, urban areas have lower average energy consumption compared to their rural counterparts. This may be due to the lower calorie requirement in urban settings compared to rural work settings that require higher amount of energy to undertake labour intensive agricultural activities.

⁵ Organisation for Economic Cooperation and Development and Food and Agriculture Organization .2018. Meat consumption (indicator). doi: 10.1787/fa290fd0-en

⁶ Platform for Agricultural Risk Management. 2016. Managing risks to improve farmers' livelihoods; Ethiopia Agricultural Risk Profile, November 2016.

The median daily calorie consumption per adult equivalent is reported to be 2788 kcal. This indicates that the energy intake of 50 per cent of the population of the country is below the mean per adult equivalent value of 3162 Kcal.

Figure 3.1: Mean and median of daily calorie consumption per adult equivalent, by region



Source: Authors' computation based on HCES 2015/16, CSA.

Table 3.4 below reports the patterns and trends of average calorie intake over the twenty years' period between 1996 and 2016 in Ethiopia. SNNPR and Gambella registered 101 per cent and 92 per cent increment in the average calorie intake over the two decades' period, respectively. The least performance in terms of percentage increase in calorie intake per adult equivalent was observed in Afar (38 per cent), Addis Ababa (44 per cent) and Amhara (45 per cent) regions. Between 1995/96 and 2015/16, per-adult-equivalent net calorie consumption increased by 62 percent at national level. During the same period, Gambella, Dire Dawa and Addis Ababa registered an increase of 18 per cent, 17 percent and 12 percent in per adult equivalent calorie intake respectively.

Table 3.4 Average Calorie intakes per adult equivalent per day, by region; 1996, 2005, 2011, 2016

Region	1995	2000	2005	2011	2016	% change(1995 to 2016)	% change(2011 to 2016)
Tigray	1,876	2,422	2,570	2,823	3,003	60	6
Afar	2,240	1,892	2,492	2,788	3,095	38	11
Amhara	1,975	2,550	2,508	2,613	2,864	45	9
Oromiya	2,016	2,688	2,893	2,978	3,287	63	10
Somali	2,144	2,175	2,713	2,863	3,188	48	11
Benshangul Gumuz	1,801	2,627	2,625	3,079	3,015	67	(2)
SNNP	1,817	2,753	2,926	3,288	3,494	92	6
Gambella	1,801	2,417	-	3,083	3,629	101	18
Harari	2,268	2,286	2,715	3,070	3,332	47	8

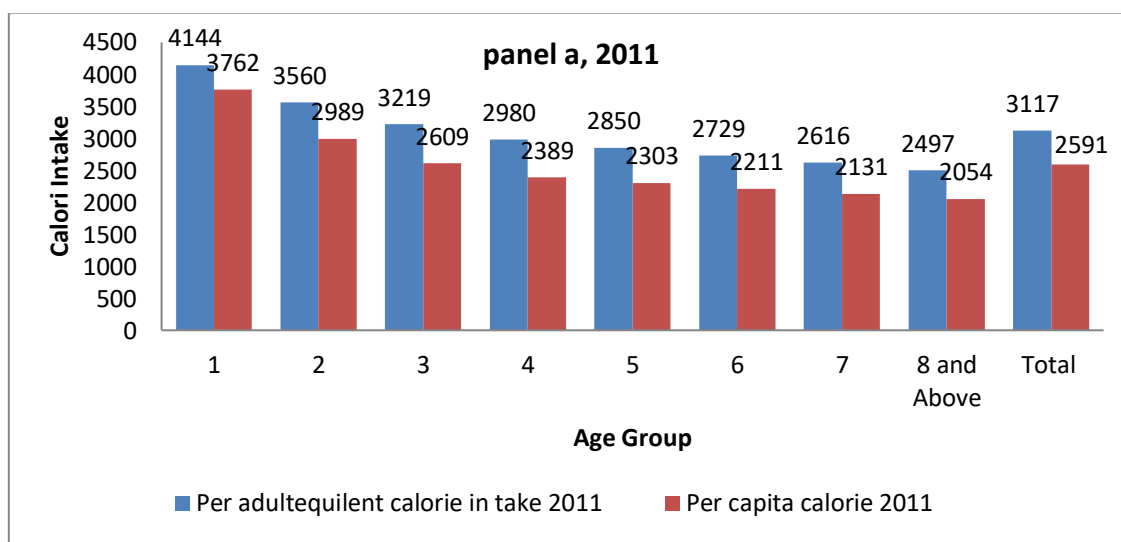
Addis Ababa	1,993	1,917	2,239	2,556	2,864	44	12
Dire Dawa	1,824	2,104	2,418	2,814	3,306	81	17
Total	1,953	2,606	2,746	2,928	3,162	62	8

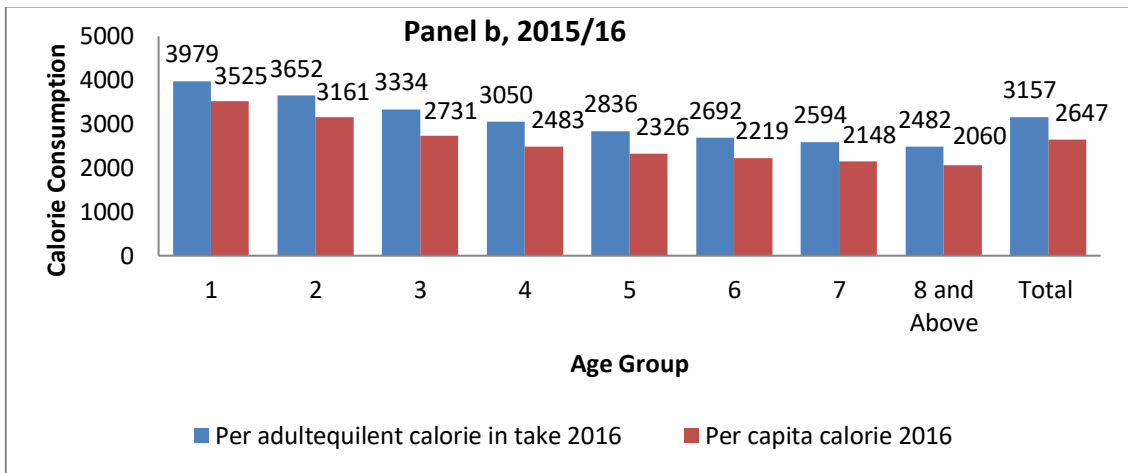
Source: Compiled and computed from Poverty Reports by MOFED and Planning Commission ;
 Author's computation from 2016 HCES

3.4.2. Relationship between Calorie Intake and Household Size

Household average energy consumption per capita and per adult equivalent calories is good indicator of calorie consumption based on the total amount of food acquisition or consumption by the household. Panels a and b of Figure 3.2 indicate that both average per capita calories intake and per adult equivalent calories declines as the number of members of the household increases. For instance in 2011, an average per capita calories intake for the households with 8 and above members is 2054 kcal which is far lower than the national average of 2591 kcal. Households with just one member have the highest per capita intake of 4144 kcal. The same pattern of relationship between household size and caloric intake is also observed in 2015/16 that smaller households have higher caloric intake than larger households. This result might be a reflection of large number of dependents and/or resource constrained.

Figure 3.2: Relationship between Calorie Intake and Household Size



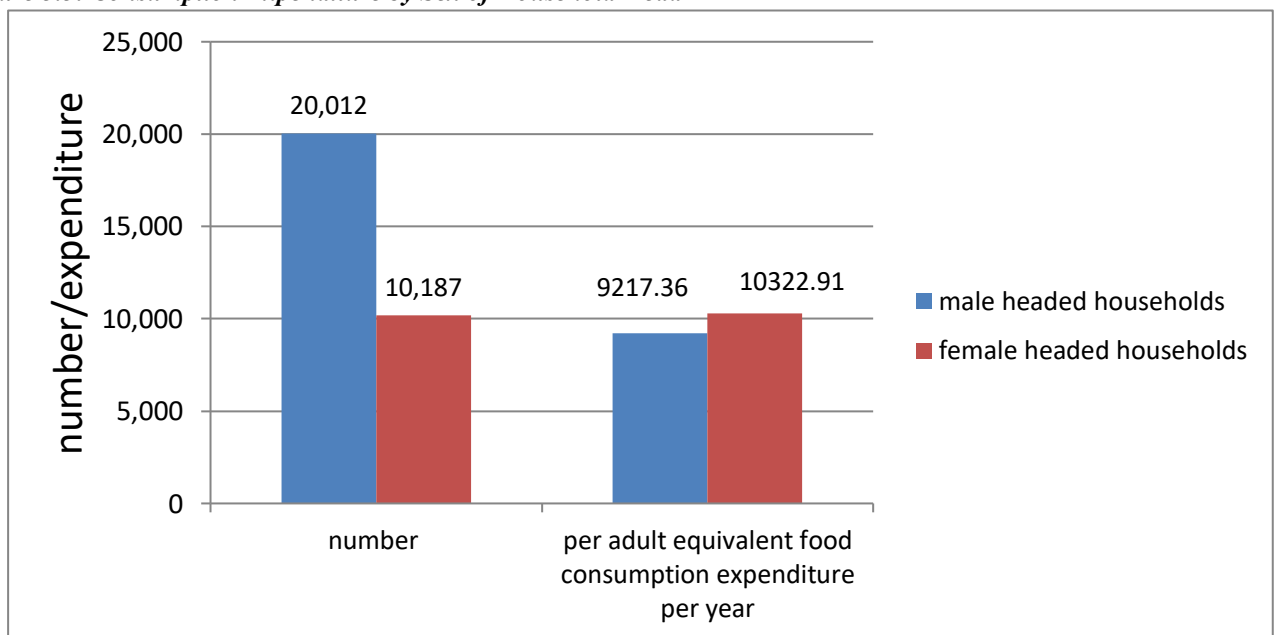


Source: Authors' Computation based on HCE, 2015/16

3.4.3. Differences in Food Energy Consumption Levels By Sex of Household Head

Figure 3.3 indicates that about one-third of sample households are headed by female. Surprisingly, despite male headed households are usually better-off than female headed households, the results show that female headed households have higher absolute adult equivalent level of consumption than male headed households. While the actual reasons for this shall be further investigated, a speculative guess may suggest that men and women household heads may have different expenditure preferences.

Figure 3.3: Consumption Expenditure by Sex of Household Head



Source: Authors' computation based on HCES 2015/16, CSA.

3.4.4. Differences in Food Energy Consumption Levels by Marital Status of the Household

Studies have showed that married individuals tend to eat more healthful diets than unmarried individuals. Contrary to the expectation, the results this descriptive report shows that never married individuals have higher per adult equivalent calorie intake, whilst households with married couples have reported the lowest per capita and per adult equivalent calorie intake. Looking into the percentage changes across two periods higher percentage change is reported in the case of separated individuals for per adult equivalent calories intake and the highest decline in the percentage change between 2010/11 and 2015/16 in per adult equivalent calories is observed for the never married individuals.

Table 3.5: Difference in per capita and per household equivalent calories intake by marital status.

<i>Marital Status</i>	Per adult equivalent Calorie Intake in 2011	Per adult equivalent Calorie Intake in 2016	% Change	Per Capita Calories in take in 2011	Per Capita Calories in take in 2016	% Change
Never Married	3682	3451	(6)	3425	184	(7)
Married	3007	3063	2	2442	2524	3
Divorced	3196	3244	1.5	2640	2703	2
Separated	3189	3415	7	2668	2856	7
Widowed	3080	3272	6	2513	2721	8
Living together	3121	2965	(4)	2650	2584	(2)

Source: Authors' computation based on HCES, CSA.

3.4.5. Differences in Food Energy Consumption Levels by Ability to Read and Write and Attendance of Formal Education

Education and literacy are important factors of food and nutrition security. We explored the relationship between the literacy and school attendance of the household and household energy consumption. The results show that per adult equivalent calorie intake is higher for households headed by individual who can read and write, and in the same vessel households with formal education attendance have higher per adult equivalent calorie intake. This result holds for the two periods and both per adult equivalent and per capita calories intake.

Table 3.6: Per Adult Equivalent and Per Capita Calorie Intake and Education

Indicators	Per adult equivalent Calorie Intake in 2011	Per adult equivalent Calorie Intake in 2016	Per Capita Calories intake in 2011	Per Capita Calories intake in 2016
<i>Ability to read and write</i>				
Yes	3146	3150	2675	2670
No	3078	3168	2481	2606
<i>Formal education attendance</i>				
Yes	3166	3156	2692	2669
No	3055	3159	2464	2599

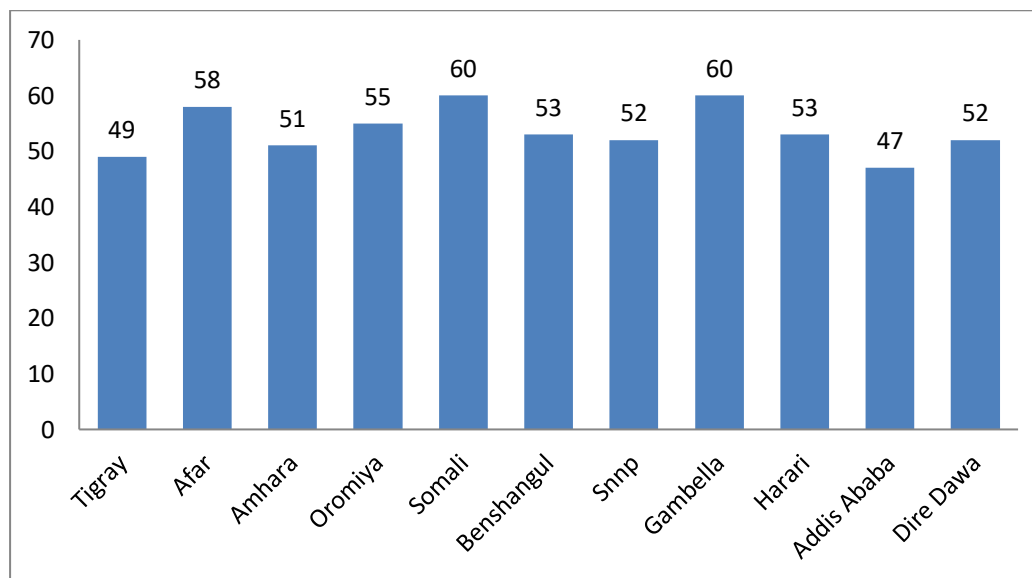
Source: Authors' computation based on HCES 2015/16, CSA.

3.5. Household's Food Consumption by patterns of expenditure

3.5.1. Regional Distribution of Food Consumption Expenditure

Generally with about half of the total consumption expenditure spent on food, the share of household food expenditure is large for all regions of Ethiopia. Somali, Gambella and Afar regions had the largest share of consumption expenditure on food, followed by Afar and Oromia. On the other hand, the share of food expenditure is lowest in Addis Ababa (47%).

Figure 3.4. Percentage share of household consumption expenditure on food by region



Source: Authors' computation based on HCES 2015/16, CSA.

3.5.2. Foodconsumption by expenditure quintiles

A number of food consumption patterns can be distinguished with increasing income and economic development: 1) processed and ready-to-eat foods take off; 2) cereals become less important; and 3) the share of high-value crops, such as fruits and vegetables, dairy and animal products, and fish, in food consumption baskets increases. Comparing the differences in consumption patterns between richer and poorer households is often indicative of how transformation of food systems will shape food economies in the country.

Having this understanding in mind, the consumption of households were ranked by quintile from poorest expenditure quintile 1 to the richest quintile 5, based on households' total

consumption and expenditure level. Also the share of the different components of food items expenditures was computed and the results are presented in Table 3.7. In line with empirical evidence and theoretical arguments, there is expectation of considerable variation in the composition of consumption baskets across quintiles.

While food expenditures make up 53.8% of total consumption expenditures for the poorest quintile, this declines to 47.8% for the richest one. Cereals make up 39% of the total food consumption for poorest quintile. Remarkably, the share is relatively stable for the poorest three quintiles and drops off only for quintiles 4 and 5, suggesting that transformation in the food basket has only started to occur in the richest two quintiles. Still, the importance of cereals remains surprisingly high even for the richest quintile, for which cereals make up 21% of the total food consumption. The expenditure on meat for the richest households comprises 16.7%, yet this is only 1.1% for the poorest ones. As for cereals, the higher consumption of meat is especially noted for the richest quintiles 4 and 5.

Table 3.7: Share of expenditures (%) by food group and expenditure quintile, 2015/16

	<i>Q1 (poorest)</i>	<i>Q2</i>	<i>Q3</i>	<i>Q4</i>	<i>Q5 (richest)</i>	<i>Overall</i>
All cereals	39.0	36.9	35.7	32.0	21.0	32.9
Pulses	9.6	9.3	8.5	8.0	5.5	8.2
Oilseeds	0.1	0.1	0.08	0.07	0.06	0.08
Meat	1.5	2.7	4.5	7.9	16.7	6.6
Fish and Seafood	0.6	0.5	0.4	0.3	0.2	0.4
Milk, Cheese and Eggs	4.8	4.7	5.2	4.9	4.1	4.7
Oil & fat	6.3	6.7	7.3	7.4	6.9	6.9
Fruits	0.2	0.4	0.5	0.6	1.0	0.5
Vegetables and Tubers	14.5	15.4	14.4	13.2	10.4	13.5
Spices	9.0	7.9	7.2	7.3	6.2	7.5
Other foods	14.0	15.0	16.0	18.2	27.7	18.1
Total food	100.0	100.0	100.0	100.0	100.0	100.0
Food versus non-food						
Food	58.3	55.8	55.5	54.4	47.8	52.8
Non-food	41.7	44.2	44.5	45.6	52.2	47.2
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Authors' calculations based on HICES 2016, CSA.

3.5.3. Energy Contribution per Expenditure

Table 3.8 shows that millet, sorghum and maize provide the largest energy in Kcal per a Birr of expenditure. On the other hand, teff and whet which account for the largest food share provide only less than half of the kcal per Birr maize and sorghum. Unfortunately, as indicated

above, the food consumption share of maize, sorghum and millet is declining while that of teff, wheat and rice is increasing.

Table 3.8. Energy Contribution per Expenditure in 2015/16, (Kcal/Birr)

	Food Item	Energy per Expenditure (Kcal/Birr)
1	Millet	525.73
2	Sorghum	518.80
3	Maize	517.57
4	Enset	443.25
5	Barley	333.47
6	Teff	224.31
7	oil and fat	214.62
8	Wheat	212.40
9	Rice	207.25
10	Potatoe and tuber	171.86
11	Oil seeds	156.96

Source: Authors' Computation based on HICE, 2015/16

3.5.4. Food Expenditure by Sex of Household Head, Attendance of Formal Education and Ability to Read and Write

Table 3.9 shows that, households headed by those who can read and write have higher average food expenditure than that of households headed by those who cannot. Again, in line with expectation, households headed by those who had attended formal education have higher food expenditure than those households headed by those who did not attend formal education. This may be due to differences in access to economic opportunities and earning possibilities.

Table 3.9: Food expenditure by sex of household head, school attendance and literacy in 2015/16

Indicators	Expenditure
Attendance of formal Education	
Yes	1463
No	1390
Ability to read and write	
Yes	1474
No	1381

Source: Authors' calculations based on HICES 2016, CSA.

3.5.5. Food consumption expenditure across disability Status of Household Head

Conventional knowledge stresses that a greater consideration of disability can help to understand influences of food access in the population, highlighting heterogeneity and physical and economic influences of food access across the population. The HICES 2016 survey asked the households to report whether the head have any kind of disability. In this regard, this analysis considers the difference in food expenditure along disability. Hence, households headed individuals without any disability have higher level of food consumption expenditure than those that are headed by a person with disability.

Table 3.10: Food expenditure by disability status of household head

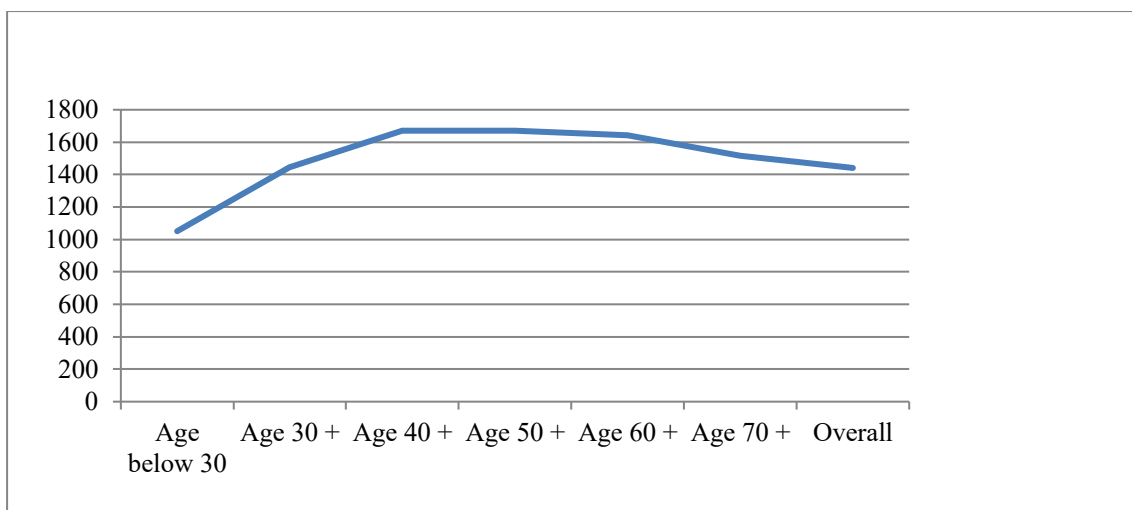
Indicators	Food Expenditure
Disability	
Yes	1257
No	1448
Total	1440

Source: Authors' calculations based on HICES 2016, CSA.

3.5.6. Food Expenditure by the Age of the Household Head

Average food consumption expenditure varies from 1051 Birr for the under-30 age group to about Birr 1447 and 1671 for the above 30 and above 40 years groups respectively and then declined to 1440 for the 70 years and older group (see figure 3.5 below). The inverted U-shape of the figure shows that the amount the households spend on the food consumption first increases, and then declines over the life cycles of the head.

Figure 3.5: Food consumption expenditure by age group

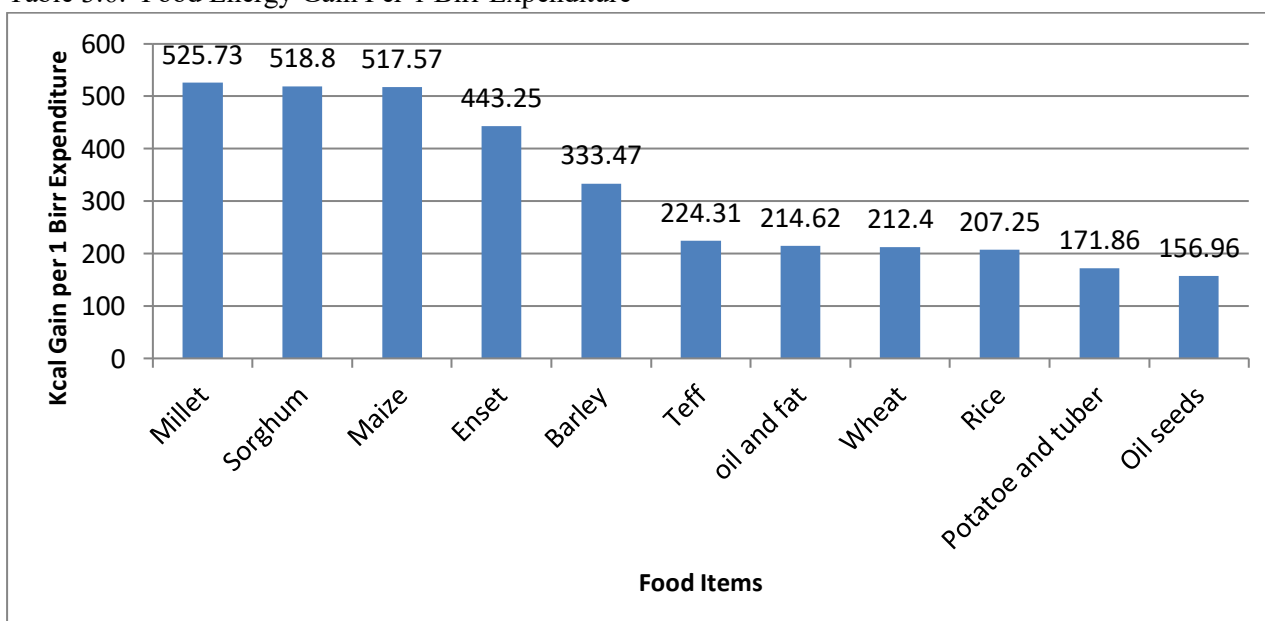


Source: Authors' calculations based on HICES 2016, CSA.

3.5.7. Food Energy Gain per Expenditure (Kcal/Birr)

One of the main considerations of consumers in developing countries would be the return of their expenditure in terms of energy gains. The results in Figure 3.6 show that crops with falling demand/consumption provide higher energy per 1 Birr of expenditure than crops with rising demand/consumption. The implication of this finding is that the consumption of crops for which demand is rising are less efficient than the consumption of crops for which demand is falling.

Table 3.6: Food Energy Gain Per 1 Birr Expenditure



Source: Authors' computation based on HCES 2015/16, CSA.

4. Conclusions and Recommendations

4.1. Conclusions

Despite Ethiopia has experienced considerable economic growth in the last one and a half decade, the share of food in the consumption expenditure of Ethiopian households is still large. Among the food consumption bundles, cereals constitute the largest share. The most widely consumed cereals include teff, wheat, maize and sorghum in their respective order of importance. The demand (consumption share of) for teff, wheat and rice is rising while that of maize and sorghum is declining over time. The consumption of animal products (meat and dairy products) is low even by sub-Saharan standard and even declining over time. Coupled with the reduction in the consumption of pulses, this could imply the reduction of consumption of protein by the Ethiopian population. Moreover, although the consumption of fruits and vegetables is low, it is increasing over time.

The median per adult equivalent energy consumption is much less than the mean value of the per adult equivalent energy consumption indicating the inequality of the distribution of energy intake. Energy consumption is the lowest in Amhara and Addis Ababa and the highest in Gambella and Southern National and Nationalities People (SNNP) regions. Compared to 1995, the national per adult equivalent energy intake increased by 63%. While Gambella (101%) and SNNPR (92%) showed the highest growth, Afar showed limited progress in energy consumption. Such variation in consumption growth might be attributable to difference in the agricultural potential of the regions, among others.

Energy consumption is negatively correlated with average per person energy intake. This might imply larger households might be vulnerable to malnutrition and consumption shocks. Women headed households have greater per-capita but lower per-adult-equivalent energy consumption implying that men headed households might have responsibility to support more number of children. Households headed by never married individuals have the highest percapita and per adult equivalent energy consumption while households with married couple report the lowest percapita and per adult equivalent energy consumption. Literacy and attending formal education are also positively associated with food consumption and energy intake. Households headed by a disabled person have lower level of food expenditure

compared to households headed by persons without disability. Food expenditure has inverted U-shape with the age of the household head.

4.2. Preliminary recommendations

Since findings from a descriptive analysis can only inform the existing situation, it is hardly possible to make a policy recommendation, which requires a more detail causality analysis method. However, one can make some general preliminary recommendations based on the findings of our study.

- The food security improvement interventions or programs shall focus on improving the supply and accessibility of food items for which demand is increasing. These crops mainly include teff, wheat and rice. However, the energy contribution of these crops is much lower than the crops with high level of energy contribution per expenditure. Therefore, there is also need to work on improving the taste or demand for such crops as maize and sorghum through awareness creation and biotechnology innovations.
- There shall be concerted effort to increase the access to or affordability of protein sources including meat, dairy products and meat. Given that Ethiopia has the largest livestock in Africa, much work has to be done on improving the productivity of the livestock sector and enhancing the livestock marketing facility in the country.
- While production interventions may focus on high agricultural potential regions, food security programs or interventions shall focus on increasing access to more food insecure regions such as Afar and Amhara.
- Given that food security is multi-pillar concept and that literacy and attendance of formal education are positively related with food consumption, adult literacy programs and promotion of school enrolment would help improve food and nutrition security in Ethiopia.
- Food security programs, particularly social protection programs, shall target highly vulnerable social groups such as larger households, the urban unemployed and poor households, households headed by old persons and persons with disabilities.

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