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Analysis of Changes in Food Consumption Patterns in Urban Ethiopia

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ABSTRACT

Consumption expenditure on different food items is generally used as a main yardstick for measuring the standard of living in developing nations. Study of temporal changes in consumption patterns provides an insight into status of welfare changes and is helpful in planning future investment decisions. In Ethiopia, since the mid 1990s there have been several efforts by the government to alleviate poverty at the national level. Thus understanding changes in urban consumption patterns provides valuable policy information on the effectiveness of policies designed to alleviate poverty. Accordingly, this paper investigates the phenomenon of changes in consumption expenditure in urban Ethiopia using two rounds (1994 and 2004) of household survey data from the Ethiopian Urban Household survey (EUHS) of ten food categories. The study employed Working-Leser expenditure share model to estimate income elasticity of demand and determinants of urban household consumption for Addis Ababa city and six major towns. The study also extended its analysis by running simulations for rise in per capita income. The results from the decomposition of per capita consumption into different demographic and economic factors confirm that urban household consumption patterns have started to shift from staple food grains to high value food products. The simulations and estimated income elasticity of demand for cereals, pulses and spices were found to be much lower than those of non-staple high value products. This transition in food consumption patterns in turn needs government policy intervention to stimulate production of food items with high demand.

1. INTRODUCTION

Ethiopia is among the lowest income countries in the world with an average per capita income of merely USD 180 (WB, 2006). It is also much less than the average per capita income for Sub-Saharan Africa (i.e., USD 450). As stated by UNDP (2003), Ethiopia scored 169 out of 175 in the human development. Moreover, for decades both rural and urban poverty in Ethiopia has remained pervasive and ever deepening, despite considerable macroeconomic stability achieved following the policy reforms of the mid-1990s.

In Ethiopia, many urban people don't meet their basic needs. According to official statistics (FDRE 2002), the proportion of the urban population under food poverty (those persons whose food expenditure per adult equivalent was less than the food poverty line) was estimated at 47 percent in 1999/00 compared to 41 percent in rural areas. Moreover, between 1995 and 1999/00, the urban food poverty head count index increased by 43.7 percent. It moderately declined in 2005/06 to 39 percent (MoFED, 2006).

Poverty in Ethiopia is associated with certain household characteristics. For example, according to FDRE 2002, compared to richer households, poor households in urban centers tend to have a large proportion of dependents, older household heads, more unemployed family members and more female-headed households (Aredo, 2005). According to FDRE 2002, female-headed households account for about 41 percent of total households in the urban centers as compared to 23 percent in rural areas and the incidence of poverty is found to be higher in depth and severity in female-headed households than their male counterparts.

Moreover, vulnerability to shocks is more serious in urban areas than in rural areas. The Government Poverty Reduction Strategy Paper (PRSP) in 1995 and 1999/00 noted without ambiguity that urban households were more vulnerable than rural households. This was partly due to the fact that urban households lack assets such as land and livestock, which are available in rural areas. Rural people have more social and economic networks and traditional values to mitigate vulnerability compared to urban people. Furthermore, the incidence of HIV/AIDS is widespread in urban areas. A recent study by Woldehanna, Hoddinott, and Dercon (2008) found that inequality remained unchanged in rural areas, while there was a substantial increase in urban areas between 1995 and 2005.

This deep-rooted poverty situation of the country is a result of the interaction of many factors. Mismanagement of the economy during the military regime, three decades of civil war, high dependency on rain fed agriculture, and failure to bring economic transformation have greatly contributed to the poor present state of the country's

economy (Gebremedhin, 2006). Unfavorable weather fluctuations may take a heavy toll on the lives of rural farmers and bring them to the brink of starvation.

Nonetheless, there have been some encouraging developments since early 1990s with the end of the civil war and a change of government. The current government since early 1990s has embarked on aggressive economic reform programs to revive the economy and accelerate progress as rapidly as possible including a big push on social and physical infrastructure, opening the economy and building institutions and decentralizing fiscal and political decision power to lower tiers of government. In this process, the government has paid due attention to eradicating rural and urban poverty and attempts are being made to cut current widespread rural and urban poverty by half by 2015 (World Bank, 2005; Gebremedhin, 2006).

As recent official government statistics revealed, economic reform in Ethiopia has brought about significant changes in economic growth at the national level. Economic performance measured by growth in GDP in real terms has been continuous for the past four years, jumping to an annual average of 10.5 percent during 2003–2007 (MoFED, 2006/07). Understanding the impact of this national growth on urban consumption patterns provides valuable policy information on the effectiveness of policies designed to alleviate poverty.

Earlier studies of poverty in Ethiopia mainly focused on rural rather than urban areas (see, for instance, Dercon and Krishnan, 2000; Dercon, 2001; Tadesse, 1999; Dercon, 2002; Bigsten *et al*, 2003). None of these studies analysed change in consumption patterns in urban Ethiopia. There are few studies that explored the poverty situation of urban households in Ethiopia in both a static and dynamic context (Disney and Kedir, 2003; Kedir 1999; Taddesse 1997; Taddesse and Dercon, 1997). However, they centered on assessing the poverty-impact of growth in the spirit of a series of similar studies elsewhere (Chen, Datt and Ravallion, 1994; Datt and Ravallion, 1992). None of them were focused on changes in consumption patterns of urban areas.

The primary objective of this study is to help understand whether there is change in urban food consumption patterns and behavior of household expenditure between 1994 and 2004. We also try to examine whether demographic and non-demographic factors explain changes in consumption patterns. This information is important for two reasons. First, rapid urbanization in Ethiopia as in many developing countries is placing heavy demands on urban marketing systems. Investment in these systems has been woefully inadequate, and understanding urban expenditure patterns is a first step in addressing these problems. Second, government policy is heavily focused on cereal production. But if there is change in consumption and expenditure patterns over time policy needs to reflect these changes by stimulating production of food items with high demand. Therefore, understanding consumption expenditure on different food items provides an

insight into status of welfare changes and is helpful in planning future investment decisions.

The remainder of this paper is organised as follows. In the following section, the conceptual framework is explained. Subsequently, the data set used in the study and method of analysis is briefly described. Following this, we present the results from the descriptive and empirical analysis. The final section sets out some concluding remarks and policy implications.

2. CONCEPTUAL FRAMEWORK

In order to examine a food consumption pattern and its determinants, it is useful to begin with a review of the economic theory of household decision. In a standard household model, households use their resources (e.g., labor, skills, land and equipments) to achieve the highest level of intended utility (satisfaction) possible. This decision could be determined by income level, preference and market prices (Ruel, Minot, Smith, 2005). Preferences are also affected by the composition of a household, its members' knowledge and education, habit and cultural norms, personal experience, and by biological factors that affect hunger.

The assumption that households pool resources and have a single set of preferences has been questioned by research on the intra-household allocation of resources and gender role within the household. Empirical researches have shown that the husbands and wives have often unequal control over resources, that they may not pool income, and that their consumption priority may differ. Some alternative household models assume a cooperative solution in which distribution of benefits depends on the bargaining position of each household. In general, the consumption patterns may vary with legal and socio-economic status of each partner and their ability to monitor each other's behavior (Oulsumbing, 2003).

The demand for high value food items (e.g., meat, milk, vegetables and fruits) increases with income. They are also expensive sources of energy. This implies that poor households are unlikely to access them. This is largely due to the fact that poor households must prioritize to fulfill their basic energy requirement to avoid hunger. This is mainly because high-value foods tend to be expensive source of energy for them. As stated by Minot (1992), households with income near to subsistence level, consume large quantities of grains and starchy staples and few fruits, vegetables, meat, milk and milk products.

Consumer preferences on the other hand, shape the decision of consumer what to consume or not. Poor households, until they meet physiological needs to satisfy hunger, have little choice but to focus on cheap sources of energy such as grains and starchy staples. Once they have satisfied their basic energy needs, households start to diversify their diets by including animal food sources, dairy products and fruits and vegetables (Ruel, Minot, Smith, 2005).

3. DATA AND METHOD OF ANALYSIS

3.1 Data

Poverty analysis is usually constrained by lack of adequate data on social and economic indicators of households or social groups. Due to high concern placed by governments and development partners, many developing countries including Ethiopia recently developed relatively reliable longitudinal databases for poverty analysis. This study uses the 1994 and 2004 panel household survey data obtained from the Ethiopian Urban Household Surveys (EUHS) conducted by the Department of Economics, Addis Ababa University in collaboration with the Department of Economics, Goteborg University. Addis Ababa (the capital city[1]) and six major towns (Awassa, Bahir Dar, Dessie, Dire Dawa, Jimma and Mekele), thought to reflect the major socioeconomic characteristics of the urban population, were selected for the survey in the five successive rounds. A total sample size of 1,500 households was allotted in proportion to the size of the population residing in each of the selected urban centers. Thus, 900 households were drawn from Addis Ababa, 126 from Dire Dawa, 73 from Awassa, 101 from Dessie and 100 from each of the remaining three cities (Tadesse, 1999). Proportional samples were then taken from all woredas (districts) in each of the urban centers and half of the kebeles (the lowest administration units) selected randomly from each woreda. Finally, using the registration of residential houses at the kebele administrative offices as the sampling frame, systematic sampling was used to select households from each of the *kebeles*. However, such an approach fails to capture homeless individuals and family units. As a result, the level of poverty measured using the data may be underestimated (Tadesse, 1999).

In all survey rounds, information was collected on a variety of socioeconomic variables of interest, including the structure and composition of households, educational and health status, employment and income, consumption and expenditure and credit (lending and borrowing) transactions. In this study, use is made of the information contained in the consumption and expenditure module of the questionnaire. Households were asked about expenditure and consumption of food on the basis of a one-week and 30-day recall period. Expenditure information on non-food (nondurable) consumption items was obtained for the month and year prior to the survey. Expenditure on short- and long-distance transport was also collected for the week prior to the survey.

3.2. Method of analysis

In measuring welfare at the household level, consumption-based measures are commonly used rather than income. This approach recognizes the volatile nature of

[1] Addis Ababa city is the major political and economic center which also has shown considerable change in resident size and different investments.

income and its problem of underestimation. Consumption on the other hand, tends to be more stable due to the availability of consumption-smoothing opportunities such as saving, borrowing and community-based risk sharing and social networks. Therefore, current consumption is often used as a better indicator of both the current and long-term standard of living (Ravallion, 1994; Lanjouw and Ravallion, 1995; Deaton, 1997).

In this study we employed Working-Leser expenditure share model. The original form of the Working-Leser model was discussed by Working (1943) and Leser (1963). Bodkin and Hsiao (1996) and Deaton and Muellbauer (1980a) provide a more detailed discussion of this functional form. In the Working-Leser model, each share of the food item is simply a linear function of the log of total expenditure on all the food items under consideration. In other words, the dependent variables are the share of total food expenditure[2] that is spent on particular groups of food items (e.g. on cereals). Right hand side variables are log of household size, log of per capita consumption, variables capturing household demographic characteristics (i.e., age, sex, household size, etc). education, sex of head and so on) and household location. Regression analysis is used to examine the factors which influence the demand for different food items. The single equation of Working-Leser food demand function can be expressed as:

$$s_i = \alpha + \beta \ln(x) + \sum \gamma_i Zi + e$$

where s is the share of the total food budget expenditure on a specific commodity (say on cereals), x is the log of total per capita expenditure of household for food, Z_i are set of household characteristics that may affect demand, and e is the residual which represents the effects of variables not included in the equation. Regression analysis generates value for β *and* γ are coefficients from estimate. In this case, regression analysis is used to explain the budget share of cereals, pulses, spices, milk, meat, vegetables, fruits, stimulants, honey and sugar, and others in the total per capita household expenditure, education of head of household and place of residence[3]. Ten separate equations were estimated for each specific commodity group.

The effect of changes in income on the consumption of each specific food item is measured by the β coefficient[4]. If β >0, the expenditure share rises within higher income; and it is considered as luxury. If β <0, the expenditure share falls (decreases)

[2] Food expenditure share is defined as the percentage of food budget of a household that allocated to specific commodities (e.g., cereals, pulses, vegetables, meat, milk and milk products, etc.). Budget share is computed for the ten food groups.

[3] In this study the researcher does not estimate demand function which include prices as explanatory variable. This is mainly because the Working-Leser Model employed for the study is based on non-price factors which influence the demand for different food items. The data did not also provide information on prices.

[4] The β coefficient measures the effect of a one-unit change in the logarithms of total per capita expenditure on the budget share of the commodity.

within higher income and it is considered a necessity. If β = 0, the budget share is constant across income levels.

The income elasticity[5] (η) can be calculated using the coefficient of per capita expenditure (β) and budget share (s) as follows:

$$\eta = 1 + - \frac{\beta}{s}$$

Since budget share(s) varies across households, the normal practice is to evaluate the income elasticity at the average budget share. If $\eta > 1$, the item is luxury, while if 0< $\eta < 1$ it is a necessity (Ruel, Minot and Smith, 2005). The γ coefficient indicates the changes in budget share associated with a one-unit change in the corresponding variable Z[6].

All the results of estimates were tested for significance of attrition rate. Since attrition in the urban panel is substantial, it is important to be sure that it is not biasing the results. We checked for this first by defining a dummy variable that equals zero if the household interviewed in both 1994 and 2004 ('non-attriters') and equals one if the household appears in 1994 rounds ("attriters"). To examine the characteristics for both attriters and non-attriters we estimated a probit. The defendant variable is a dummy variable defined above and the right hand side variables are household characteristics as of 1994. As a result from probit regression shows, none of these characteristics found to be significant implying estimated results are not biased due to attrition rate.

[5] . More specifically, it is elasticity of expenditure of the household. In other words, an elasticity of 2 (β =2) implies that if per capita expenditure of household increases by 1%; per capita spending on the commodity will rise by 2%.

[6] For example, if Z_i is variable indicating whether the household has female head, then γ =2 implies that (other factors remain equal), female headed household has a budget share two percentages higher than a male headed household. Similarly, the value of γ coefficients associated with household size indicates the effect of an additional member on the budget share.

4. DESCRIPTIVE AND EMPIRICAL RESULTS

4.1 Descriptive results on consumption pattern

With the above variables arranged, the next stage is specifying the analytical methodology. In this paper, a combination of both descriptive and empirical methods is employed to analyse the data. Descriptive analysis centered on some basic statistics regarding temporal and spatial differences in the food consumption patterns. It tries to identify whether there is a change in consumption patterns (expenditure share of food item) between 1994 and 2004 in different towns, male and female headed households, level of education, young and old, and other demographic variables. In the following section the pattern of per capita food expenditure, share of food and non-food expenditure of total household spending, and per capita food expenditure in quintiles shall be explored.

4.1.1 Pattern of food expenditure

As several previous studies have shown, in Ethiopia expenditure on cereals on average account for more than 60 percent of the total household living expenditure. Figure 1 reports the share of total food expenditure spent on each group in 1994 and 2004. Within food expenditure, Ethiopia's urban consumers in 1994 on average allocated the largest proportion to cereals (44.3%), followed by spices (13.3%), milk and milk products (8.4%), bread and others (8.5%), with the smallest proportions allocated to meat and other animal products (2.7%) and to fruits (1.4%). However this pattern changed considerably in 2004. For instance, cereals share of food budget dropped from 44.3 per cent to 32.9 percent while all of the rest except for pulses and stimulants have registered an increase in expenditure share. The increase in a share of high value food items is more visible compared to others. For instance, food budget share of meat increased from 2.7 percent in 1994 to 9.7 percent, milk and milk products from 8.4 to 9.6 percent, vegetable, fruits and sugar and honey each shown about one percent growth in 2004 compared to 1994.

Figure 1: Patterns of Urban Households Food Expenditure Share (%) in 1994 & 2004

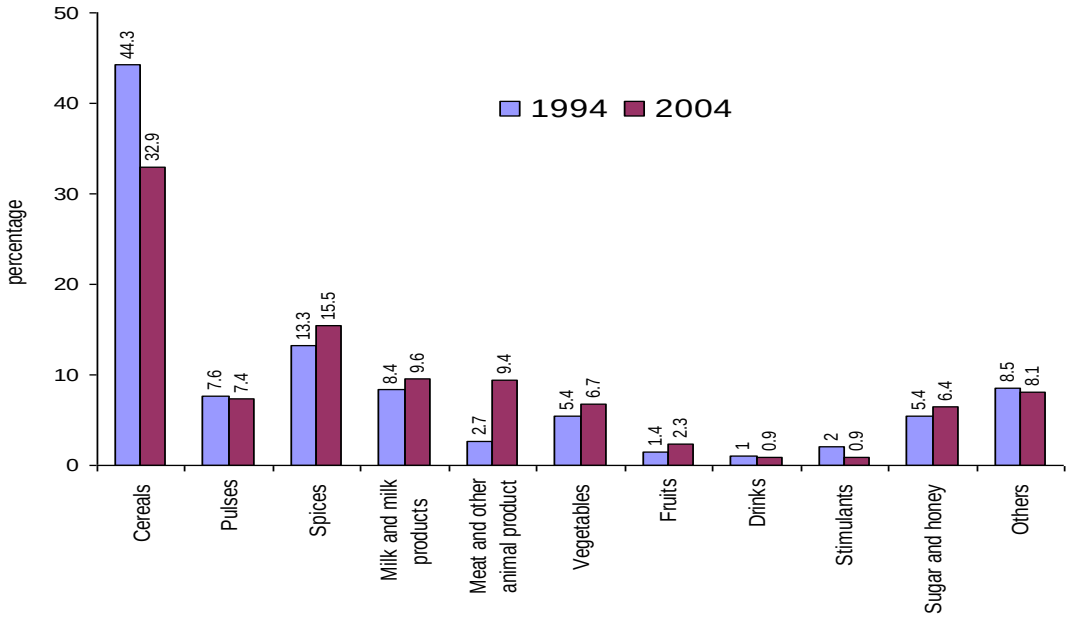

Figure 1: Patterns of urban households food expenditure share (%) in 1994 & 2004

When we disaggregate expenditure of 2004 within each group, from cereal *teff* alone constitutes 74 percent and wheat for 12%; within pulses *shiro* for 26% and lentils for 28%; from spices and cooking oil for 49% and onion for 17%; within meat beef alone for 76.8%, chicken and egg for 24.5% and mutton accounting for 20%. From this we deduced that Ethiopian urban household food consumption and expenditure is dominated by a very few food items implying that any shock in price and supply has high effect on household consumption patterns.

Table 1 explores whether there is a difference in food expenditure patterns between Addis Ababa and other six towns covered in the survey. Addis Ababa city is the economic and political center of the country and is subject to both local and external economic changes. As descriptive statistics indicate, the change in consumption patterns in Addis Ababa city and other towns are similar. In Addis Ababa, consumption expenditure for cereals was drop from 43 to 25 percent in between 1994 and 2004 while decline in cereals budget share in other towns was moderate. Overall, there is a considerable shift in consumption of meat and milk. Of 900 households covered during the 1994 survey in Addis Ababa only 147 reported that they consume meat in a month and its food expenditure share was only about 2.5 percent. In 2004, for the same question 739 households responded that they consume meat on a monthly basis and its budget share increased from 2.5 percent in 1994 to about 13.3 percent in. The budget share for milk increased from 9 percent in 1994 to 15.6 percent in 2004. In the same

period, the number of households reported to consume milk increased from 346 to 646 which shows considerable increase both in expenditure share and number of respondents.

Table 1: Pattern of food expenditure in Addis Ababa city and other major towns in 1994 and 2004

City/towns		Food aggregates	Cereals	Pulses	Spices	Milk and milk products	Meat and other animal	Vegetables	Fruits	Drinks	Stimulants	Sugar and honey	Others
Addis Ababa	1994	Observations	817	821	886	346	147	712	332	813	80	613	600
		Mean	158.6	28.9	45.4	78.5	51	24.5	19.1	3.7	50.2	28.9	39.8
		St. Dev	100.3	26.5	42.5	61.1	63.9	27.5	16.3	16.1	41.9	30	39.2
		Exp. share (%)	43.1	7.9	13.4	9	2.5	5.8	2.1	1	1.3	5.9	7.9
	2004	Observations	799	818	1408	646	739	1287	643	332	343	1303	10.3
		Mean	145.0	32.3	65.7	88.6	75.5	30.9	21.3	16.2	15.4	29.1	46.9
		St. Dev	94.3	23.9	45.3	130.9	89.5	29.1	21.6	35.7	32.5	29.8	54.0
		Exp. share (%)	25.6	5.7	11.6	15.6	13.3	5.5	3.8	2.9	2.7	5.1	8.3
Other towns*	1994	Observations	542	501	572	244	161	508	143	536	93	361	338
		Mean	148.9	27.55	46.5	65.7	46.7	21.3	16.4	5.6	42.5	28.2	54.1
		St. Dev	86	21.6	32.6	63.8	55.6	19.7	12.2	18.9	34	21.5	86.9
		Exp. share (%)	41.8	7.1	13.8	8.3	3.9	5.6	1.2	1.6	2	5.3	9.5
	2004	Observations	564	545	570	209	294	520	227	100	116	506	369
		Mean	137	30.2	63.2	63.2	63.9	33.1	19.8	19.9	27	31.8	50.2
		St. Dev	87.8	24.5	40.1	87.7	61.9	36.3	20.9	36.4	41.3	35.5	65.2
		Exp. share (%)	35.4	5.6	11.7	11.7	11.8	6.1	3.7	3.7	5.0	5.9	9.3

* Include Mekele, Desie, Bahir Dar, Harar, Awassa, Jimma
Source: Author's calculation using 1994 and 2004 EUHS data

The pattern of consumption in six other towns[7] also followed more or less the same pattern of change to Addis Ababa city. Among others considerable change viewed in cereals and meat consumption. Budget share on cereals dropped from 42 percent to 35.5 percent while for meat increased from 3.9 percent in 1994 to 11.9 percent in 2004.

4.1.2 Food and non-food expenditure

Understanding whether there is change in food and non-food expenditure share in total household spending provides important information for policy makers. Increasing food expenditure share means households have less resource to spend on other non-food

[7] Other towns here refers to average figure of six towns (Awassa, Dire Dawa, Bahir Dar, Dessie, Jimma, Mekele) covered in the EUHS.

expenditures such as education, health, and consumer durables. Table 2 shows the urban household budget share allocated for food and non-food commodities in 1994 and 2004. Results indicate that Dessie, Dire Dawa and Mekele towns are the extreme cases where 69-73 percent of the average household expenditure is spent on food. This may be due to the fact that these two towns are located in food deficit regions and usually depend on imported food from surplus areas. In such cases, relative prices are usually found to be expensive. On the other hand, Bahir Dar, Awassa, and Jimma towns spend relatively smaller amounts of their total income (ranges between 58- 64.5%) on food. This may be explained by the fact that all of these towns are located in relatively food surplus areas where food prices might be lower. The food expenditure share in Addis Ababa city lies close to average. This is may be due to its radial location where all markets use it as reference place.

Table 2: Food and non-food expenditure share by major city/town in 1994 and 2004

City/town	1994				2004			
	Food		Non-food		Food		Non-food	
	Avg.	%	Avg.	%	Avg.	%	Avg.	%
Addis Ababa	422.8	64.3	259.0	35.7	483.9	63.7	275.6	36.3
Awass	461.9	64.2	257.0	35.8	491.2	58.1	354.3	41.9
Bahir Dar	531.0	62.4	296.0	37.6	500.3	65.3	265.6	34.7
Dessie	416.6	72.8	251.5	27.2	345.2	67.0	170.1	33.0
Dire Dawa	520.4	69.3	194.9	30.7	399.9	73.6	143.2	26.4
Jimma	472.5	64.3	209.3	35.7	395.1	70.7	163.5	29.3
Mekele	337.7	65.6	187.4	34.4	559.6	72.2	215.6	27.8
Average	451.6	64.3	236.4	35.7	353.6	61.0	226.5	39.0

Source: Author's calculation using 1994 and 2004 EUHS data

4.1.3 Per capita food expenditure in 1994 and 2004

In order to compare poverty outcomes across households with different sizes and compositions, poverty analysis tends to either use per capita consumption or adult equivalent. In the former case, aggregate household consumption/expenditure is converted into consumption per capita. In this study, we also use real per capita expenditure to explore whether there is change in per capita consumption. Table 3 compares average real monthly per capita expenditure in 1994 and 2004. Monthly real per capita food expenditure in Addis Ababa city and six other towns on average increased 4.7% (i.e., from Birr 66.9 in 1994 to Birr 70.1 in 2004). However, there is considerable divergence between towns. Mekele town has registered the highest increase in per capita consumption, followed by Addis Ababa city, Awassa and Bahir Dar. On the other hand, Dessie, Dire Dawa and Jimma towns have shown a large drop

in real per capita food expenditure between the two periods. It is difficult to clearly point out major factors accounting for this decline in real per capita food expenditure; perhaps decline in real per capita income may account for increasing food price inflation in the last four to five years. The situation might be severe in traditional food deficit areas like in Dessie and Dire Dawa. The decline in real per capita income for Jimma town might be explained by volatile world coffee prices. This is because Jimma accounts for about 20-30% national coffee supply and the lives of environs highly linked with coffee production, marketing and with world and local coffee price situation.

Table 3: Real per capita food expenditure (*Birr)* in 1994 and 2004

Year	Addis Ababa	Awassa	Bahir Dar	Dessie	Dire Dawa	Jimma	Mekele	Average
1994	64.2	65.4	66.7	60.0	86.9	64.8	65	66.9
2004	71.9	72.6	69.5	53.4	78.1	60.1	84.5	70.1
Growth (%)	12	11	4.2	-11	-10.1	-7.3	30	4.7

Source: Author's calculation using EUHS data for 1994 and 2004

Table 4 shows the average monthly per capita expenditure on food in major city/towns. It also disaggregates into male and female headed households and by education to explore whether or not there is a difference between different groups. As the results indicate, per capita food expenditure varies with demographic and location of households. For instance, per capita expenditure for male-headed households is higher by more than 10 per cent compared with female-headed households both in 1994 and 2004. Similarly, households with a higher level of education have higher per capita food expenditure compared to those with a low level of education. When we consider location, per capita food expenditure was higher in Dire Dawa and Mekel towns in 1994 and 2004 respectively.

Table 4: Monthly average per capita food expenditure by gender and education

City/town	1994						
	Gender		Level of education				
	MH	FH	Illiterate	Literate	Primary	Secondary	Tertiary
Addis Ababa	66.1	62.5	45.1	54.7	62.9	78.6	92.1
Awass	68.2	63.8	40.8	29.6	48.2	84.0	140.9
Bahir Dar	78.6	37.4	38.6	58.1	61.8	86.1	111.3
Dessie	66.3	52.3	55.6	50.6	54.0	79.2	82.0
Dire Dawa	86.8	91.9	93.5	92.1	81.0	83.0	112
Jimma	68.1	58.2	53.2	58.2	53.9	79.6	106.6
Mekele	60.1	43.1	38.8	50.5	41.4	92.9	99.9
Average	70.6	58.5	52.2	56.3	57.6	83.3	106.4
2004							
Addis Ababa	84.5	70.0	62.2	64.6	80.1	101.6	119.2
Awass	97.4	68.7	54.8	53.9	88.3	82.1	145.0
Bahir Dar	89.8	65.5	53.6	72.0	66.2	139.3	118.7
Dessie	68	60.5	58.7		66.0	75.5	71.0
Dire Dawa	65.3	72.4	57.7	51.8	64.7	82.9	111.7
Jimma	58	50.3	36.8	61.5	59.8	68.9	82.4
Mekele	81	91.4	96.2	58.4	102.5	81.5	75.2
Average	77.7	68.4	60.0	60.4	75.4	90.3	103.3

Source: Authors calculation using 1994 and 2004 EUHS data

4.1.4 Expenditure quintiles

The total per capita food expenditure (spent only on food) was used to measure household well-being. The households were divided into four equal groups (each with 366 observations or 25% of population) to illustrate the differences across income/expenditure groups. Table 5 depicts this difference. The deviation in average monthly per capita expenditure on food between the poorest (quintile 1) and richest group (quintile 4) is wide. The richest group has a per capita income expenditure on food that is nine times higher than the poorest group. The deviation in per capita food expenditure between the richest and the poorest group remained similar between 1994 and 2004. The estimated Gini coefficient for 1994 and 2004 was 0.442 and 0.438, which indicates existence of greater inequality among the urban population. This finding is consistent with the mean income difference between quintiles. However, the poorest group per capita food expenditure has shown considerable improvement in 2004 compared to 1994 (see Table 5).

Table 5: The average per capita food expenditure in four quintiles

Quintile	1994		2004		% Change (b/n 94 & 04)
	Mean	Std.	Mean	Std.	
1st (poorest)	18.22	7.55	24.7	8.39	35.6
2nd	41.57	6.95	47.9	7.19	15.2
3rd	71.3	10.4	79.06	11.4	10.9
4th (richest)	163.3	94.9	191.2	156	17.1
Average	73.6	29.9	85.7	45.7	19.7

Source: Author's calculation using 1994 and 2004 EUHS data

4.2 Empirical results and discussion

This section explores the estimated results of the Working-Leser expenditure model. Ten separate estimations were made using budget share of each category as a function of log of per capita food expenditure and other economic and demographic variables (household size, age, education, dependency ratio, and dummy for gender of household head location keeping Addis Ababa city as a reference). The location dummy was used due to the significant differences in grain consumption patterns between them. Table 6 reports results of estimates for eight food items (for more detailed see annexed Tables 9). Per capita food consumption is negatively but significantly associated with expenditure share of cereals, pulses, and spices. The negative relation indicates that there is a decreasing share of spending on these food items as per capita income increases. This is consistent with theories of necessity goods. Conversely, results show per capita food consumption is positively and significantly (at 95% of confidence level) related with milk, meat and other animal products. This also fits with the theory that spending on high value food items increases with increase in income.

Table 6: The parameter estimates of the Working- Leser with demographic effects for 2004

Dependent variables	Cereal's	Pulse's	Spice's	Milk & milk product's	Meat & animal product's	Vegetable	Fruit's
Log of per capita	-0.067* (0.011)	-0.0253* (0.007)	-0.0323* (0.005)	0.060* (0.006)	0.0564* (0.006)	-0.0024 (0.004)	0.009* (0.002)
Log of Age	0.028 (0.020)	0.006 (0.009)	0.0085 (0.011)	-0.0221 (0.011)	0.0013 (0.011)	-0.0018 (0.009)	-0.0051 (0.006)
Log of family size	0.047* (0.012)	0.007 (0.007)	-0.0216* (0.007)	-0.027* (0.007)	-0.019* (0.006)	-0.0038 (0.004)	-0.0027 (0.005)
Education	-0.012* (0.0048)	0.002 (0.002)	0.0083* (0.0025)	0.0020 (0.0032)	0.0028 (0.0029)	-0.0006 (0.0017)	0.0014 (0.0013)
Dependency ratio	0.011 (0.009)	-0.005 (0.003)	-0.0068 (0.005)	0.0069 (0.006)	0.0000 (0.005)	0.0106 0.0111	0.0000 0.0020
Female dummy	0.008 (0.011)	-0.005 (0.004)	0.0125* (0.006)	0.0001 (0.007)	-0.0054 (0.006)	0.0049 (0.0046)	-0.000 (0.0024)
Location-Awasa	0.025 (0.019)	-0.008 (0.005)	-0.022* (0.008)	0.0140 (0.013)	-0.020* (0.009)	0.0092 (0.007)	0.0186 (0.009)
Location-Bahir Dar	0.053* (0.019)	0.039* (0.016)	0.0095 (0.010)	-0.0319* (0.009)	0.0052 (0.013)	-0.0254* (0.006)	-0.011* (0.003)
Location Dire Dawa	-0.001 (0.020)	-0.026* (0.006)	0.035* (0.0124)	-0.0207 (0.012)	-0.0092 (0.009)	0.02905* (0.013)	-0.005 (0.004)
Location Jimma	0.042* (0.0203)	0.0048 (0.0059)	-0.028* (0.0094)	-0.0075 (0.012)	0.0237 (0.012)	-0.0179* (0.005)	-0.007* (0.003)
Location - Mekele	0.054* (0.0257)	-0.018* (0.006)	-0.008 (0.008)	-0.063* (0.008)	0.0098 (0.0141)	0.032* (0.0103)	-0.014* (0.0024)

The asterisk indicate that the estimated coefficients is statistically significant at 5% or better; and SFE is share of food expenditure
Source: Author's estimation using 1994 and 2004 EUHS data

While the age of household head doesn't seem to have any significant impact on the consumption of any grain products, the education level of household head is only significantly associated with cereals consumption (i.e., households with highly educated household heads tend to consume less cereals). Household size is positively related with demand for cereal, and negatively related with demand for milk, meat, vegetables and fruits. This is due to the fact that a major objective of larger households is to meet a minimum daily calorific requirement which is usually realized through consumption of basic staple food items (cereals). Consumption of high value foods (e.g., milk, meat, vegetables and fruits) is partly affected by family size; that is, when family size is large it is less likely to consume regularly high value foods mainly due to the implication on budget. The education of the household head is negatively and significantly associated with demand for cereals. This finding is somewhat surprising in light of the link between education and cereal consumption. It may partly be explained by the increasing education level of the household head leading to a shift/diversification in household consumption from cereals to high value foods.

The regression analysis for female headed households (as indicated by female dummy) provides less conclusive evidence of a difference compared to male-headed households. The only statistically significant difference viewed in spice demand was the share of expenditure on spices by female-headed households at about 2.2 percent higher than in male-headed households. This finding is consistence with the expectation that diet quality improves when women have more control over household decisions.

Area of residence (location) dummy results indicates whether or not there is a difference in consumption demand for different food items among different towns (when Addis Ababa considered as base). Other things being equal, the share of cereals' consumption in Mekele, Jimma, Bahir Dar, and Awassa is about 5.4, 4.2, 5.3, 2.5 percents higher than it is in Addis Ababa. Conversely, the budget share on milk and milk products of Mekele (6.3%) and Bahir Dar (3.1%) is lower than it is in base category (Addis Ababa). The statistical significance of many location dummies in the model confirms the existence of significant regional differences in the demand for cereals, pulses, milk, meat, vegetables and fruits within the country. This may in turn reflect differences in prices and availability between regions.

Table 7 presents income elasticity of demand for major food items for 1994 and 2004. Income elasticities of demand vary between food items and over years. Cereal, pulses and vegetables value ranges between 0.7 and 0.9 in both years. This indicates that a 10 percent increase in income associated with 6 to 9 percent increase in budget allocated to these food items. When income elasicities are in the range 0 and 1, then food item (s) are categorized as necessities.

Table 7: Income elasticity[8] for major food categories for 1994 and 2004

Major food items	1994			2004		
	Average budget share (s)	Coefficient (β)	Income Elasticity $(\eta = 1 + \frac{\beta}{s})$	Average budget share ((s)	Coefficient (β)	Income Elasticity $(\eta = 1 + \frac{\beta}{s})$
Cereals	0.421	-0.0438	0.9	0.323	-0.0674	0.8
Pulses	0.079	-0.008	0.9	0.076	-0.0253	0.7
Spices	0.137	-0.024	0.8	0.161	-0.0323	0.8
Vegetables	0.056	-0.004	0.9	0.067	-0.0024	1.0
Fruits	0.014	0.0049	1.4	0.017	0.009	1.5
Meat	0.020	0.0208	2.0	0.063	0.056	1.9
Milk	0.057	0.0421	1.7	0.053	0.060	2.1
Stimulant	0.015	0.0053	1.4	0.012	-0.0024	0.8
Sugar & honey	0.051	0.1311	3.6	0.064	0.006	1.1
Others	0.09	-0.0172	0.8	0.070	0.0054	1.1

Source: Author's estimation using 1994 and 2004 EUHS data

On the other hand, income elasticity of demand for fruits, milk, meat and sugar ranges from 1.1 to 3.6. This shows that a one percent increase in income results in more than a one percent in demand for these items. The elasticity of demand for sugar followed by meat and milk is found to be higher compared to others. This implies that with income growth urban consumers tend to consume more high value food items. Sugar registered very high elasticity of demand among others. This might be due to its multiple use as an important ingredient for different types of food. These findings support the earlier findings that urban household consumption patterns are shifting from consumption of staples to high value crops like to milk, meat, fruits and sugar.

The test conducted a check to determine whether elasticities are stable over years by pooling the data across years and including year dummy. Then year dummy we let year dummy to interact with log of per capita food expenditure. The interaction term was found not to be statistically significant implying that elasticity is not stable over years.

In the earlier section we have tried to show how different types of food demand will change as incomes rise. In the following section we extend the above idea by running some simulations. For example, suppose per capita incomes continues to rise by 5 percent per year, in these urban centers what would food demand look like for consecutive five years for major food items? Results of the simulation are shown in Table 8.

[8] Proportionate change in the demand for a good in response to a change in income. It is reflected in how people change their consumption habits with changes in their income levels. In a growing economy (where income levels are rising) goods whose demand is highly income-dependent will sell more than the goods whose demand is not income-dependent. For example, demand for staple food items normally does not increase with higher income levels; but demand for high value foods and products (e.g., gourmet food or restaurant food) does increase as individual's income grows. Also called income sensitivity of demand, it is mathematically expressed as percent change in quantity demanded over percent change in income.

The results from the simulation have some interesting findings. That is, cereals, pulses, spices and vegetables have elasticity below one implying that they will remain necessarily foods with expenditure on these food items either constant or declining as income increases. On the other hand, income elasticity of demand for meat and other animal products, milk and milk products and for fruits consistently remained larger than one implying their demand increases with an increase in income. For these three food categories, income elasticity continuously increases as per capita income increases by 5%. For instance, meat and other animal products from 2.1 to 2.8 and milk and milk products from 1.9 to 2.6 in a five year period. This result is consistent with earlier studies by Regimi, Deepak, Seale, and Bernstein (2000) where they found that rising income and improved access to a greater variety of food results in changes in food and developing countries exhibit greater preference for high-value food products as income increases.

Table 8: Simulation result: if per capita income grows by 5% for five successive years

Food items	Budget Share (s)	Coefficient (β)					Estimated elasticity of demand				
							1st Year	2nd Year	3rd Year	4th Year	5th Year
Cereals	0.32	-0.07	-0.12	-0.11	-0.11	-0.11	0.8	0.6	0.7	0.7	0.66
Pulses	0.08	-0.02	-0.04	-0.04	-0.04	-0.04	0.7	0.4	0.4	0.4	0.40
Spices	0.16	-0.03	-0.05	-0.05	-0.05	-0.05	0.8	0.7	0.7	0.7	0.68
Milk	0.05	0.06	0.09	0.10	0.10	0.10	2.1	2.7	2.8	2.8	2.78
Meat and other animal products	0.06	0.06	0.09	0.09	0.09	0.09	1.9	2.4	2.5	2.5	2.46
Fruits	0.02	0.01	0.01	0.01	0.01	0.01	1.5	1.9	1.8	1.8	1.82
Vegetables	0.07	0.00	0.00	0.00	0.00	0.00	1.0	1.0	1.0	1.0	0.97

In general, if things remain stable, the expected increase in population combined with rising income levels in Ethiopia, anticipated to increase in food demand for high value products over the next couple of years.

5. CONCLUSIONS AND POLICY IMPLICATION

This paper has examined the phenomenon of changes in consumption patterns in urban Ethiopia using two rounds (1994 and 2004) of household survey data from the Ethiopian Urban Household survey (EUHS) for ten major food commodities (i.e., cereals, pulses, spices, milk, meat and other animal products, vegetables, fruits, stimulants, sugar and honey and others). The study employed Working-Leser expenditure share model to estimate demand elasticity and determinants of urban household consumption for Addis Ababa city and six other towns. The following salient results were obtained.

First, as the results from descriptive statistics on the number of meals per person per day show, there has been considerable improvement in frequency of food consumption between 1994 and 2004. The average monthly per capita food expenditure (for Addis Ababa and six towns) increased by 14.7 %. Mekele and Awassa towns registered the highest increase in per capita food expenditure compared to others.

Second, Ethiopia's urban consumption pattern is shifting from traditional staple food consumption to non-staple and high value food items such as milk and milk products, meat and fruits. This change in consumption pattern is stronger for Addis Ababa dwellers compared to other towns. Among others, share of food expenditure spent on meat has registered a radical shift from about 2 % in 1994 to 13% in 2004. This is perhaps expected to continue to increase at a significant rate if current growth momentum of the economy is maintained.

Third, as the finding from expenditure quintiles shows, deviation in average monthly per capita food expenditure between the poorest (1^{st} quintile) and the richest group (4^{th} quintile) is exceedingly wide. The richest group has nine times higher per capita expenditure on food compared to the poorest. Similarly, as findings from Gini coefficients depict, the top 20% of households get about 80% of total income and the rest 80% of households have only 20% share of total income.

Fourth, the estimated income elasticities of demand for cereals, pulses, and spices (staple foods) are significantly lower than those for most non-staple high value food products. This may imply that food consumption pattern in urban Ethiopia is shifting from staple grain commodities to non-staple and high-value food products (i.e., to meat, milk, fruits and vegetables) as income increases. This finding is also confirmed by analysis of descriptive statistics.

Fifth, in addition to income, food demand in urban Ethiopia is affected by regional and demographic variables such as household size, dependency ratio, age, gender and education level of household head. Household size tends to affect the per capita consumption of cereal products positively and spices negatively. Regional differences in

food consumption patterns in urban Ethiopia are very significant, especially between Addis Ababa and other towns.

In general, the study has conclusively shown that there has been improvement in income levels of urban population irrespective of their location and income group as indicated by changes in consumption patterns in favor of superior items. With increase in income, people in general have started moving towards consumption of superior food items in urban areas. This changing food consumption pattern if managed properly will contribute to a continuous growth in demand for non-staple and high-value food products in Ethiopia in the coming decade.

Factors such as urbanization will also lead to a dynamic shifting of demand within commodity groups. This presents both an opportunity and a risk. It would serve as an opportunity, if increasing demand responded adequately, then it would serve as source of additional employment and income for producers and ultimately contribute for national growth. However, failure to respond may result in price hike which could hamper demand for commodity. Therefore, it is highly recommended for the Ethiopian government to play a role in directing investment, stimulating participation of the private sector in the production of high value food items and regulating performance of markets for these commodities.

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Table 9: The parameter estimates of the Working- Leser with demographic effects for 2004

Dependent variables	Cereal's SFE	Pulse's SFE	Spice's SFEs	Milk & milk product's SFE	Meat & animal product's SFE	Vegetable SFE	Fruit's SFE	Stimulant's SFE	Sugar & honey	Others
Intercept	0.3864	0.1670*	0.2590*	-0.1242	-0.1953	0.0904	-0.0000	0.0583	-0.0295	0.1218
	(0.095)	(0.0386)	(0.0495)	(0.0556)	(0.051)	(0.0437)	(0.0206)	(0.0469)	(0.0329)	(0.0599)
	4.06	4.32	5.23	-2.23	-3.87	2.07	-0.00	1.24	-0.90	2.03
lnpcfexp (Log per capita food expenditure)	-0.0674*	-0.0253*	-0.0323*	0.0600*	0.0564*	-0.0024	0.0090*	-0.0024	0.0060	0.0054
	(0.011)	(0.007)	(0.005)	(0.006)	(0.006)	(0.004)	(0.002)	(0.004)	(0.004)	(0.005)
	t stat -6.20	-3.49	-6.59	9.52	10.02	-0.54	4.17	-0.60	1.49	1.11
lnage (age of household head)	0.0280	0.0057	0.0085	-0.0221	0.0013	-0.0018	-0.0051	0.0039	0.0099	-0.0222
	(0.020)	(0.009)	(0.011)	(0.011)	(0.011)	(0.009)	(0.006)	(0.008)	(0.006)	(0.012)
	t stat 1.44	0.64	0.79	-1.95	0.12	-0.20	-0.84	0.48	1.61	-1.80
lnfsize (Log of family size)	0.0467*	-0.0065	-0.0216*	-0.0269*	-0.0195*	-0.0038	-0.0027	-0.0065	-0.0079	0.0021
	(0.0118)	(0.007)	(0.007)	(0.0073)	(0.0064)	(0.0039)	(0.0049)	(0.0052)	(0.00430	(0.0068)
	t stat 3.97	-0.99	-3.07	3.69	3.02	-0.96	-0.55	-1.26	-1.84	0.31
Edu (highest education level of head)	-0.0124*	0.0024	0.0083*	0.0020	0.0028	-0.0006	0.0014	0.0031	-0.0017	0.0029
	(0.0048)	(0.0018)	0.0025	0.0032	0.0029	0.0017	0.0013	0.0018	0.0018	0.0026
	t stat -2.57	1.30	3.25	0.62	0.97	-0.39	1.12	1.68	-0.95	1.13
Fdum (Female dummy)	0.0075	-0.0052	0.0125*	0.0001	-0.0054	0.0049	-0.0000	0.0061	-0.0116*	0.0052
	(0.0114)	(0.0044)	(0.0059)	(0.0067)	(0.006)	(0.0046)	(0.0024)	(0.005)	(0.0039)	(0.0061)
	t stat 0.66	-1.16	2.11	0.02	-0.86	1.05	-0.02	1.22	-2.96	0.85

The asterisk indicate that the estimated coefficients is statistically significant at 5% or better; and SFE is share of food expenditure
Source: Author's estimation result using 1994 and 2004 EUHS data

Cont…..

Dependent variables	Cereal's SFE	Pulse's SFE	Spice' SFEs	Milk & milk product's SFE	Meat & animal product's SFE	Vegetable SFE	Fruit's SFE	Stimulant's SFE	Sugar & honey	Others
Depnr (dependency ratio)	0.0109	-0.0047	-0.0068	0.0069	0.0000	0.0106	0.0000	-0.0011	-0.0026	-0.0027
	0.0094	0.0028	0.0046	0.0055	0.0046	0.0111	0.0020	0.0035	0.0017	0.0043
	t stat 0.12	-1.65	-1.48	1.24	0.01	0.96	0.02	-0.33	-1.57	-0.62
Locawa (Location dummy for Awassa town)	0.025	-0.0083	-0.022*	0.0140	-0.020*	0.0092	0.0186	-0.018*	0.0027	0.0123
	(0.0192)	(0.0052)	(0.0078)	(0.0131)	(0.0092)	(0.0069)	(0.0093)	(0.0063)	(0.0059)	(0.127)
2004	t stat 1.28	-1.60	-2.82	1.07	-2.18	1.33	2.00	-2.83	0.46	0.97
Locbdar (Location dummy for Bahir Dar town)	0.0525*	0.0395*	0.0095	-0.0319*	0.0052	-0.0254*	-0.0109*	0.0063	-0.0075*	-0.0227*
	(0.0193)	(0.0162)	(0.010)	(0.0088)	(0.0129)	(0.0063)	(0.0024)	(0.0099)	(0.0023)	(0.0079)
	t stat 2.72	2.43	0.94	-3.61	0.40	-4.02	-4.43	0.64	-3.25	-2.86
Locdirdw (Location dummy for Dire Dawa town)	-0.0011	-0.0257*	0.0348*	-0.0207	-0.0092	0.02905*	-0.0045	-0.0066	-0.0058	-0.0018
	(0.0199)	(0.0063)	(0.0124)	(0.0120)	(0.0088)	(0.0134)	(0.0044)	(0.0058)	(0.0032)	(0.0130)
	t stat -0.06	-4.06	2.80	-1.72	-1.05	2.15	-1.01	-1.14	-1.82	-0.14
Locjima (Location dummy for Jimma town)	0.0417*	0.0048	-0.028*	-0.0075	0.0237	-0.0179*	-0.0067*	-0.0060	-0.0052*	-0.0029
	(0.0203)	(0.0059)	(0.009)	(0.0122)	(0.0122)	(0.0052)	(0.0026)	(0.0121)	(0.0022)	(0.0099)
	t stat 2.05	0.08	-2.91	-0.62	1.93	-3.39	-2.51	-0.50	-2.37	-0.30
Locmkl (Location dummy for Mekele town)	0.0536*	-0.018*	-0.0078	-0.063*	0.0098	0.032*	-0.014*	0.0129	0.0030	-0.026
	(0.0257)	(0.0061)	(0.00850	(0.0084)	(0.0141)	(0.0103)	(0.0024)	(0.0073)	(0.329)	(0.0132)
	t stat 2.09	-2.97	-0.91	-7.44	0.70	3.08	-5.63	1.76	-0.90	0.06

The asterisk indicate that the estimated coefficients is statistically significant at 5% or better
Source: Author's estimation result using 1994 and 2004 EUHS data

Table 10: Monthly average expenditure on transport 1994 and 2004

Major city/town	Expenditure on transport		
	1994	2004	% Change
Addis Ababa	37.2	30.6	-18
Awassa	13.8	22.1	60
Bahir Dar	12.1	14.4	19
Dessie	9.8	14.5	48
Diredawa	11.8	15.5	31
Jimma	14.5	17.6	21
Mekele	11.4	8.9	22
Average	16.0	18.1	26.2

Table 11: Monthly average expenditure on prepared food 1994 and 2004

Major city/town	Expenditure on prepared food		
	1994	2004	% change
Addis Ababa	20.7	27.5	32.9
Awassa	27.0	33.0	22.2
Bahir Dar	17.4	9.3	-46.6
Dessie	19.1	8.7	-54.5
Diredawa	22.3	16.8	-24.7
Jimma	31.4	55.7	77.4
Mekele	15.8	18.2	15.2
Average	22.0	24.2	3.1

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1) Yabibal Mulualem Walle, Tourist Flows and its Determinants in Ethiopia, 2010; EDRI Working Paper 001.

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