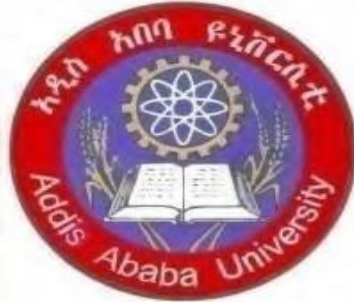


**ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCES
SCHOOL OF PUBLIC HEALTH**



**EFFECT OF FOOD PRICE ELASTICITY ON DIETRY INTAKE OF
PREGNANT WOMEN LIVING IN BUTAJIRA HDSS, ETHIOPIA:
ALMOST IDEAL DEMAND SYSEYEM APPROACH**

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**A THESIS SUBMITTED TO THE SCHOOL OF PUBLIC HEALTH IN
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Acronyms

AIDS	Almost Ideal Demand System
AME	Adult Male Equivalent
BMI	Body Mass Index
BRHP	Butajira Rural Health Program
CGE	Computable General Equilibrium
CSA	Central Statistics Agency
DCP	Depressed Current Productivity
DSS	Demographic Surveillance Site
EDHS	Ethiopian Demographic and Health Survey
EPHI	Ethiopian Public Health Institute
FANTA	Food and Nutrition Technical Assistance III Project
FAO	Food and Agriculture Organization
FCS	Food Consumption Score
GDP	Gross Domestic Product
HDSS	Health and Demographic Surveillance System
HCES	Household Consumption and Expenditure Survey
IDD	Iodine Deficiency Disorder
IUGR	Intrauterine Growth Retardation
LBW	Low Birth Weight
NCDs	Non Communicable Diseases
SDG	Sustainable Development Goal
SES	Socio Economic Status
SNNPR	Southern Nations, Nationalities and peoples Regional State
UN	United Nations
WHO	World Health Organization

Abstract

Background: In Sub-Saharan Africa, low body mass index (<18.5 kg/m²) during pregnancy is common showing a prevalence of 20%-39% in Ethiopia. Although pregnancy requires adequate and balanced dietary intake, price increase conveys to shift to less quality and quantity food groups. Globally, a 10% increase in the price of cereals reduced demand for cereals by 6.1% in low-income countries. The highest own-price elasticity occurred for animal products. For the cross price elasticity, a reduction in cereal consumption of 6.1%, increased consumption of fruit and vegetables, animal products, fats, oils, and sweets by 4.2%. The study contributes to fill the gap of showing the link between food price change which is nutrition sensitive and dietary intake of pregnant women who are target groups for 1,000 days intervention.

Objective: To assess responsiveness of food group consumption due to own and cross price elasticity of food groups among pregnant women living in Butajira HDSS, Ethiopia.

Method:- The study design was community based comparative cross-sectional design. It was conducted in Butajira HDSS, Gurage zone, Southern Nations, Nationalities and Peoples' Regional state on ≥ 24 weeks pregnant women who were selected randomly from a sampling frame obtained from the Health and demographic surveillance system (HDSS). Data were collected from April 27th, 2017 – June 1st, 2018. The household food consumption and expenditure survey (HCES) assessed the food consumption and expenditure pattern of 65 food items. Adult Male Equivalent (AME) approach was used to calculate intrahousehold dietary consumption. STATA version 14 was used for analysis. Almost ideal demand system (AIDS) model was used to assess uncompensated own and cross price elasticity of 5 food groups. The price elasticity parameter estimation was adjusted for household size, age and wealth quartile.

Result: Two hundred eighty five women who are ≥ 24 weeks pregnant living in 10 kebeles of Butajira HDSS were eligible for inclusion in the study. The response rate was 98.9%. For the own price elasticity, in Butajira HDSS high price sensitivity occurred for cereals (-1.557), pulses (-3.947), animal products (-1.007) and others (-1.379). The greatest sensitivity occurred for pulses (-3.947). Similar finding is shown for the urban and rural areas except for animal product (-0.698) showing lower price sensitivity in the urban area. Vegetables and fruits showed lowest price sensitivity in Butajira HDSS and both areas. For the cross price elasticity, in Butajira HDSS, the cross effects are high for pulses, animal products and others substituted by cereals. In both urban and rural areas, the cross effects are high for pulses and animal products substituted by cereals.

Conclusion: All food groups respond to price elasticities in both urban and rural areas of Butajira HDSS. While pregnant women require increased intake, in Butajira HDSS high price sensitivity occurred for cereals, pulses, animal products and others. High cross price sensitivity occurred for pulses, animal products and others substituted by cereals. This lowers intake of essential nutrients such as carbohydrates, proteins, calcium, iron and zinc. Attention needs to be given for food price changes in order to minimize its effect on pregnant women.

Key words: *Pregnant women, HCES, AIDS model, Cross price elasticity, Own price elasticity*

Chapter 1: Introduction

1.1 Background

Food security is access by all people at all times to sufficient food. Adequate dietary intake is a fundamental pillar of human life for a healthy functioning of the body. Nutritional intake requirement varies with respect to age, gender, pregnancy and lactation.⁽¹⁻⁴⁾ Pregnancy is a critical period during which adequate maternal nutrition is a key determinant of healthy pregnancy, delivery and proper infant growth until adulthood.⁽⁵⁻⁷⁾ This lowers the risk of intra uterine growth restriction (IUGR), preterm birth, low birth weight (LBW), stunting and non communicable diseases (NCDs) affecting the child and the generation after.^(8, 9)

Globally, the number of chronically undernourished people in 2017 increased to 821 million, compared to the 2016 that was, 815 million, up from 777 million in 2015. This indicates that the food security situation is rising, in particular in parts of Sub-Saharan Africa, Asia and South America.^(10, 11) The highest peak of food price occurred on 2008 and 2011. On 2016, the real food price index has fallen which was still above the 1990s and early 2000s level.⁽¹⁰⁾ Countries bear high food price depending on multiple causative factors in different seasons.^(12, 13) Price change mainly affects poor families, net buyers and female-headed households⁽¹⁴⁾ conveying the vulnerable groups decline their purchasing power, education, health services, and productive assets forcing them minimize the portion size and quality of their diet.^(15, 16)

In Ethiopia, households spend approximately 53% of their income on food while 50% of their foods contain calories that are from starchy staples and 30% of the foods are less diversified foods meaning they consume three or less food groups.⁽¹⁷⁾ While there is minimal dietary intake in the country, on 2018, the price of the major cereals, pulses, vegetables and fruits has increased which can affect the vulnerable groups particularly pregnant women even worse.⁽⁴⁾

This study was conducted to compute the price elasticity on the food consumption pattern of pregnant women using household consumption and expenditure survey (HCES). It used adult male equivalent (AME) to calculate the food consumption of the pregnant women from the household. It used the almost ideal demand system (AIDS) model to calculate the dietary intake change for 5 food groups. It calculated the own and cross price elasticity.^(18, 19)

1.2 Statement of the problem

Across the world in 2016, half of all deaths among children under five were due to undernutrition. The prevalence of stunting fell from 29.5% to 22.9% between 2005 and 2016, although 155 million children under five years of age still suffer from stunting. Wasting affected one in twelve (52 million) of all children under five years of age. Micronutrient deficiencies which is called “hidden hunger” affected more than 2 billion people.^(20, 21)

Currently, all forms of malnutrition (undernutrition, micronutrient deficiencies, and over weight) cost the global economy an estimated \$3.5 trillion per year, or \$500 per individual. The effects of malnutrition in developing countries can translate into losses in Gross Domestic Product (GDP) of up to 2-3% annually, creating a major impediment for a country to reduce poverty and achievement of important targets such as the Sustainable Development Goals (SDGs).⁽²²⁻²⁴⁾

Fighting undernutrition plays significant role on advancing the economic growth of a country since it relates to multisectoral aspects. Evidence shows that adequate nutrition during the 1,000-day window can save more than 1 million lives each year. It can significantly reduce the human and economic burden of diseases such as tuberculosis, malaria and HIV and AIDS. It can reduce the risk for developing various non-communicable diseases such as diabetes and other chronic conditions later in life. It can improve an individual’s educational achievement and earning potential and it can increase a country’s GDP by at least 2–3% annually.^(25, 26)

In Ethiopia, households consume highly unvaried diets. The highest percentages of households consuming three or fewer food groups are in Afar (47%), SNNPR (43%), Somali (38%) and Amhara (36%). Rural households across all regions have less diverse diets (34% consume three or fewer food groups) than urban households (16%).⁽²⁷⁾ In more than one from four households (26%) consume less than acceptable diets. At a regional level, by far the highest prevalence of households with a less than acceptable diet (poor and borderline food consumption) is found in SNNPR with 63%.⁽²⁸⁾

Central Statistical Agency (CSA) evidenced that, the rise in the food index by 19.9% on 2018 is due to the rise in the indices of the regions where the index from SNNPR is the highest (22.0%). In Addis Ababa it is 8.7%, Afar 18.6%, Amhara 18.7%, Benishangul Gumuzby 19.0%, Dire Dawa 13.5%, Gambella 10.6%, Harari 6.3%, Oromia 23.0%, SNNP 22.0%, Somali 13.1% and Tigray 12.1%.⁽⁴⁾

Given the fact that the dietary intake of the Ethiopian population is mainly focused on small food group staple foods, the yearly increase of food price brings a notable decline in the quality and quantity of the diet consumed. This mainly affects pregnant women because of the minimal household share of foods, while she is in need of additional dietary intake for a healthy growth of the fetus and birth outcome.⁽²⁹⁻³¹⁾

While it is mandatory to eradicate malnutrition, the global demand for food is expected to increase by 60 percent by 2050 because of the increasing occurrence of climate change, natural resource constraints and competing demands. This factor highly challenges the food security of a household leading to additional burden of supplying accessible and affordable food items for the low-income households and developing countries such as Ethiopia. This challenges the ambition of a world without hunger and malnutrition by 2030. Achieving the goal will require renewed efforts through new ways of working by addressing nutrition sensitive problems, which are the underlying causes of malnutrition focused on food accessibility in a household at all times. In addition, attention is required for pregnant women who spend as much as 80% of their income on food because they are the source population to eradicate intergenerational malnutrition.⁽¹⁰⁾

Therefore, nutrition sensitive approaches such as food price elasticity need to be addressed to tackle the effect of food price change on vulnerable groups particularly pregnant women, who are the source of intergenerational malnutrition (1000 days). In view of the above background, this study is aimed to assess responsiveness of food group consumption due to own and cross price elasticity of food groups among pregnant women living in Butajira HDSS, Ethiopia.

1.3 Significance of the study

The primary objective of this study is to assess to what extent, the increase in price of food results in a deterioration of the dietary intake of pregnant women comparing elasticity of food group prices in both urban and rural kebeles. The unprecedented elasticity of food prices in Ethiopia brought interest in the empirical analysis of demand because of the lack of Ethiopia specific demand elasticity estimates, this interest makes the present study timely. Certainly, price elasticities of demand not only show the effect of economic behaviour on dietary intake of pregnant women, but can also enhance policy analysis marking the attention required for pregnant women to tackle the vicious cycle of under nutrition.

As of this paper analyzes the uncompensated (Marshallian) own and cross price elasticity, it makes it compulsory for the formulation of various public policies and many strategic decisions undertaken at the industry level and to estimate the future demand of agricultural products to attain food security in the country. This study is an attempt towards this direction, with focus on the changes in dietary intake pattern of pregnant women and estimation of the demand parameters of major food groups.

The study will contribute in filling the gap of showing the link between high food prices; which is a nutrition sensitive approach and dietary intake of pregnant women; which is the source where inter generational malnutrition occurs (1,000 days). These two approaches are currently the focus areas of the Ethiopian intervention since addressing these issues is the core turning point to change the generational malnutrition, which existed for decades.

Thus, the finding brings massive advantage on the improvement of maternal nutrition. This research can be used as a reference for other researchers in Ethiopia and abroad studying on maternal nutrition, food price and dietary intake outcomes and food price elasticity across the urban and rural areas of low-income countries.

Chapter 2: Literature review

2.1 Widespread effect of price elasticity

Price elasticity commonly occurs in different population groups living in different countries during different times and seasons depending on the geographical area, sociocultural status, seasonal variation, infrastructure, wealth status, agricultural production and supply chain. High food price affects the vulnerable population groups majorly the poor people compelling them below the poverty line. They spend three quarters of their income on staple foods compared to other commodities. (19, 32-34)

A study done on the implications of higher global food prices for poverty in 10 low-income countries showed significant increase in poverty line during the rise of staple foods particularly showing increased response of the urban area, as they are net consumers. In Cambodia, A 10% price increase of rice raised the national poverty rates by 0.5%, while beef price brought lower increment on the rural and national poverty rates because they are sellers not consumers unlike people living in Madagascar, who are net buyers. In Madagascar, 10% price raise of rice increases poverty by 1.8%. In Malawi, maize raised poverty by 0.6% in the urban and 0.4% in the rural areas with a total increase of 0.5%. In Zambia, maize price increase raised poverty by 1.1% in the urban areas, and 0.6% in the rural areas for the total increase of 0.8%. (35, 36)

The Ethiopian CSA published on 2015/16 showed that 23.5% of the total population (25.6% in rural and 14.8% in urban areas) is under the poverty line. While around a quarter of the population is under the poverty line, the country experiences non-linear price elasticity, every year, which repeatedly affects not only the population's dietary intake but also lowers the purchasing power of the poor and net buyer households raising the risk of increasing the poverty line even worse. (15, 16, 37-39)

High food price affects urban households, landless laborers, smallholders who are net food buyers, petty traders, female-headed households, people living with HIV/AIDS, pastoralists, refugees and drought-affected families. (40, 41) On a contrary, high food price positively affects net sellers of food. Price increases may improve nutrition security for the sellers.

As rural households are both producers and consumers, they may also sell out expensive food items and instead buy cheaper foods. This decision, however, leads them to buy and consume less nutritious food items. (15-17, 38, 42)

Food price increase has a range of social, behavioral and interpersonal negative consequences. People are forced to borrow food/money from friends and relatives, reduce health or education expenditure, work harder seeking additional work opportunities to cover expenditure of their family members, forced to sell their productive assets and migrate to other places. This can potentially lead to increased vulnerability of affected people for socially unacceptable livelihood activities such as begging, prostitution and theft. (15, 43, 44)

This triggers social unrest such as protests, riots, violence and war. Historical evidences confirm that sudden spikes in food prices exacerbate the risk of political unrest and conflict, as witnessed in Egypt (1977), Morocco (1981), Tunisia (1984) and Jordan (1996). More recently, the global food price crises of 2007–08 and 2011 triggered riots in more than 40 countries. Food riots often erupt first in urban areas, where households depend primarily on market foods. (41, 45, 46)

2.2 Effect of price elasticity on dietary Intake

Although it is mandatory for all individuals to be food secure, geographical area, seasonal variation, asset ownership and income, sociocultural status trigger high food price which affects household food security status. (45, 47) Globally, there is a varied price change among different food items/types, thus countries respond differently. On 2017, staple food grain prices increased nearly by 4%, mostly in maize prices and edible oils rose by 2 % this conveys reduced meal size and shift to less quality and quantity of food items. (42, 48)

Food and Agriculture Organization (FAO) reported that high food price increases the number of undernourished people from 804 million in 2016 to 821 million in 2017. In 2003-05, the number of undernourished people was 848 million and in 2007, it was 923 million, of which 907 million lives in the developing countries. During the year (2007–2008 and 2010), global food production was at a record high. However, because of the high prices, about 870 million people were hungry during the period 2010–2012. (45, 49, 50)

From 2014 to 2016, 775 million people in the low- and middle-income countries were unable to acquire sufficient food to meet their daily minimum dietary energy requirements. This means that 13.2% of these countries' population did not consume the necessary average food energy supply of 2,620 calories per capita per day.^(21, 45) During times of high food price, they lower their intake of fruits, vegetables, meat and dairy products increasing the portion of cereals, sweets and fats.⁽⁵¹⁻⁵³⁾

Systemic reviews done on 38 countries having different income status compared the elasticity of nine-food groups. It showed that 10% increase in the global price of cereals reduced demand for cereals by 6.1% in low-income countries and 4.3% in high-income countries, which is equivalent to 72 kcal and 40 kcal reductions per person per day. The highest own-price elasticity estimates were for meat, fish and dairy. For the cross price elasticity, a reduction in cereal consumption of 6.1% increased consumption of fruit and vegetables, fish, dairy products, fats and oils, and sweets by 4.2%.^(34, 36)

In Ethiopia, during the year 2014/15, the annualized food inflation scaled up to 7.4% from 5.9% in 2013/14 showing a 1.5% increase because of a significant growth in the prices of food products such as oils and fats. Between mid-2007 and mid-2008, prices of teff and wheat doubled, while maize prices jumped by about four-fold over the same period. Prices of staple grain also increased significantly. The price of teff in mid-2009 was 30% higher, compared to mid-2007.^(9, 38, 54) A literature done in rural Ethiopia showed that both own and cross-price elasticity parameters were statistically significant at 1% level of significance for all households.

The finding presented that elasticities declined for teff, fruits & vegetables and animal products but increased for barely, wheat, maize and sorghum. The reduction in price elasticity for teff consumption is higher; reflecting the demand for teff is more sensitive to price change. On a contrary, two studies proved that the coefficient on the price of teff is not statistically significant to decrease the number of teff consumption while for others it was significant. The researcher indicated that the reason could be because teff is a luxury food that they do not consume much or people switch to other grains instead of minimizing teff consumption or as majority are producers, they could be benefiting from high price of teff. For the expenditure elasticities of sorghum, pulses, and the enset group, it was found higher than the urban area.

However, two literatures done in urban area showed that a 10 % increase in the price of teff was associated with 0.14 % decrease in the number of meals consumed.^(3, 17, 55, 56) Similarly, another study implied that there was higher expenditure elasticities for other cereals, oil seeds, sugar and salt. Elasticity for cereals had higher response in both areas. Own-price elasticities came similar for all food groups and more varied for cross-price effects within each food groups. Cross price elasticity among the four major cereal items teff, wheat, maize, and sorghum complementarity was detected but substitution appears to be the link between teff and wheat which shows that there is limited possibility in food consumption for substitution and/or complementarity.⁽⁵⁷⁾

A study done across regions of Ethiopia showed that own-price elasticity exhibits much more variability across regions. However, across regions, no significant difference is observed in own-price elasticities for cereals except in rural SNNPR, where price elasticity (-0.27) is way below the national average of -0.82. Across regions, cereals were found price inelastic. On average, household food consumption was expected to fall by 0.82% and 0.86% for a 1% increase in the price in rural and urban areas, respectively. Unlike cereals, demands for all other food items exhibit a great deal of geographical heterogeneity in terms of their response to price change.⁽⁵⁸⁾

2.3 Dietary intake during pregnancy

Good nutrition during the 1,000-day period between the start of a woman's pregnancy and her child's second year is critical to the future health and wellbeing of her child. For a full-term pregnancy of 40 weeks, 12.5 kg weight gain is expected during pregnancy. The right nutrition during this window can have a profound effect on a child's ability to grow healthy.^(6, 59) In most developing countries, the dietary consumption pattern of pregnant women is limited due to limited access to food, lack of power at the household level and social norm.⁽⁶⁰⁾

During high price season, they reduce food expenditure and their own intake in order to increase food availability for other household members.^(15, 42, 61, 62) Female-headed households are often among the poorest and therefore a larger proportion of their expenditure is devoted to food that are still cheaper and low in quality. This also implies while the women is pregnant.^(3, 63, 64)

Maternal and child undernutrition account for 11% of the global burden of disease.^(65, 66) It is the underlying cause of more than 2.6 million child deaths each year, 27% of all children globally are stunted. This chronic undernutrition affects one out of three children under five years of age in the developing world, with 80% of these children living in just 22 countries. ^(8, 24, 59, 64, 66)

Study done in Indonesia showed that during a low price season, more than 80% of the pregnant women had inadequate energy and 40% had inadequate protein and vitamin A intake. All women had inadequate calcium and iron intake. The food intake consisted of rice, nuts, pulses, and vegetables, meaning that it was mainly plant-based food. This shows that women do not consume adequate diet without experiencing any crisis. During a crisis, rice remained an important supplier of energy, protein and carbohydrates but food intake among the urban poor and the rural landless poor subgroups was minimized. ^(67, 68)

Another study done in India showed that, women's diet was insufficient in energy and all nutrients, aggravating low intakes of micronutrients were found which were reflected in low intakes of foods other than rice. ⁽⁶⁹⁾ Under nutrition, anemia and iodine deficiency during the 1,000 days brings irreversible effects on a child's ability to learn.⁽⁷⁰⁾ In Zimbabwe, malnutrition reduced lifetime earnings by 12% affecting schooling. Educational attainment at age 26 with birthweights between 3 and 3.5 kgs was 1.4 times higher compared with those between 2.5 and 3 kgs. The probability of attaining higher education at age 26 were 2.6 times higher among the tallest compared with the shortest cohort. ^(71, 72)

Less productivity is another feature that is affected due to high food price. Low-income countries lose billions of dollars a year. The loss to the GDP is as high as 2–3%. Low birth weight lowers IQ by 5%, stunting by 5-11%, iodine deficiency 10-15%, and iron deficiency anemia (IDA) reduces by 8%. In India productivity losses from stunting, iodine deficiency, and iron deficiency together are responsible for a loss of 2.95% of the GDP. Preventing low birth weight for an individual was worth of \$580 and preventing micronutrient deficiencies alone in China and India was worth between \$2.5 and \$5 billion annually, which is about 0.2-0.4% of the countries GDP. ^(29, 71, 73, 74)

2.4 Conceptual framework

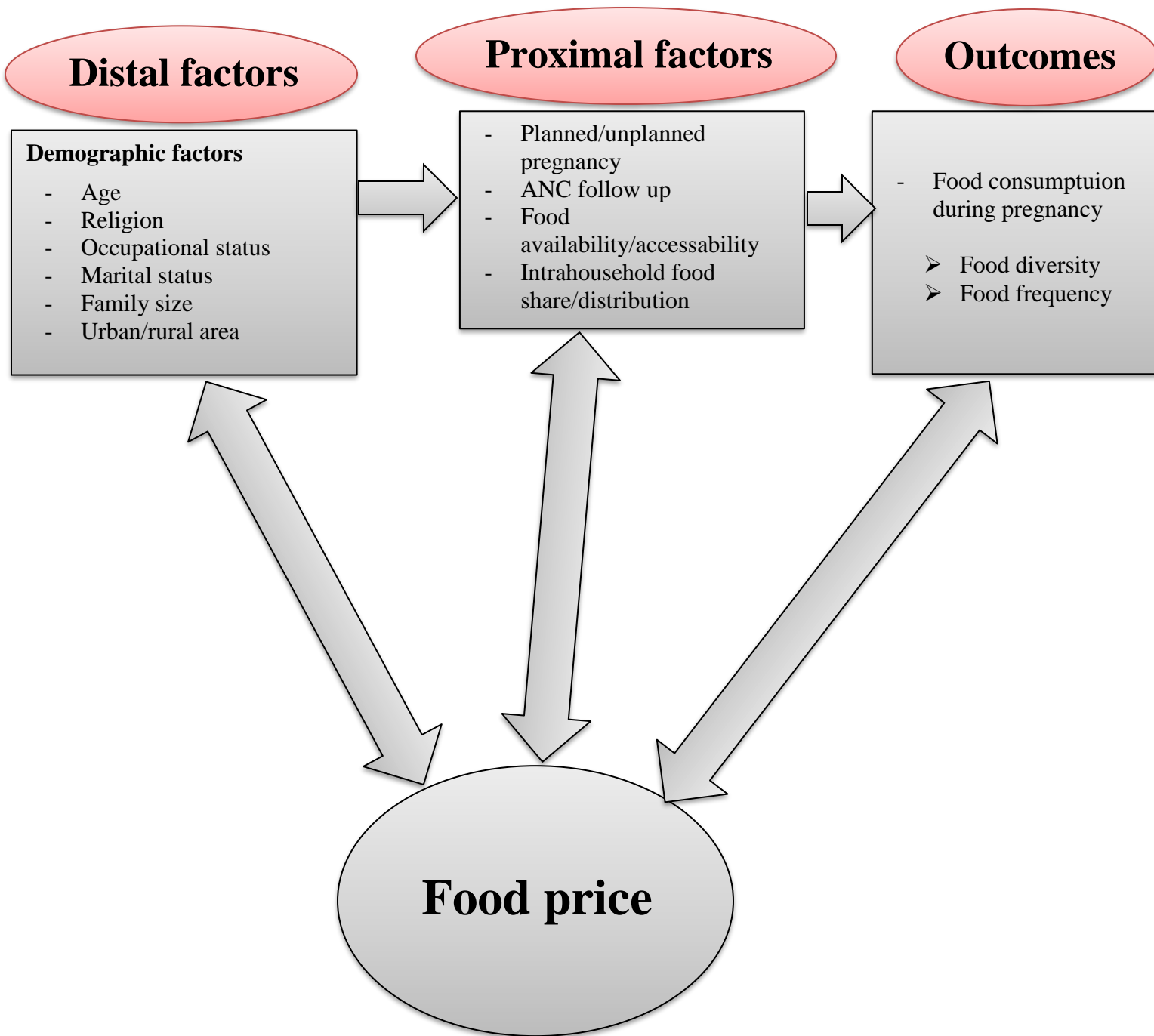


Figure 1: Conceptual framework: Distal, Proximal and outcomes of food price

Chapter 3: OBJECTIVES

3.1 General objective

- To assess responsiveness of food group consumption due to own and cross price elasticity of food groups among pregnant women living in Butajira HDSS, Ethiopia.

3.2 Specific objective

- To estimate own and cross price elasticity of food groups in Butajira HDSS.
- To compare own and cross price elasticity of food groups between urban and rural kebeles of Butajira HDSS.

Chapter 4: Materials and methods

4.1 Study area

The study was conducted in the Butajira HDSS. The Butajira HDSS is located in Gurage zone, Southern Nations, Nationalities and Peoples Regional State (SNNPR) in Ethiopia. The Butajira HDSS site has 10 kebeles which are located in Meskan, Mareko and Silti districts. The estimated land size of the districts is 797 km². The area is located 138 kms south of Addis Ababa. The Butajira HDSS is selected because it is possible to obtain a list of all pregnant women that are living in the area which can be used as a sampling frame for this study. According to the 2007 census, the districts have a total population of 33,406 of whom 16,923 are male and 16,483 are female. The majority of the inhabitants were Islam, with 51.3% of the population, 39.6% were orthodox christian, 8.1% were protestant.⁽⁵⁸⁾ The major economic activities are agriculture where legumes, root crops, maize and enset, are consumed including livestock rearing. From the nine rural kebeles, four are found in lowland areas and the remaining five are in the highlands. The urban kebele is situated in midland.⁽⁷⁵⁾

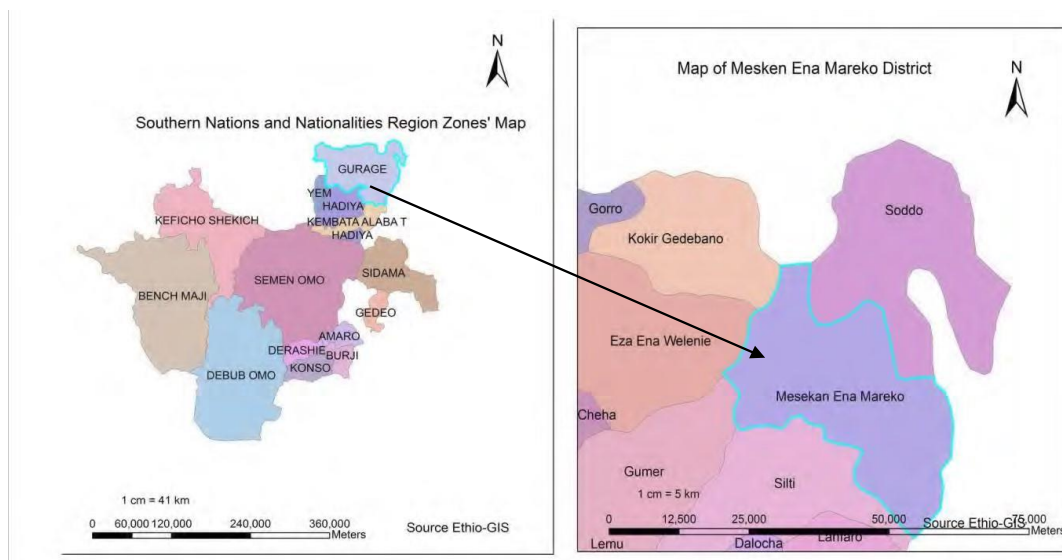


Figure 2: Map of Southern Nations, Nationalities and Peoples' Region: Gurage Zone, 2017

4.2 Study design and period

The study design was a community based comparative cross-sectional study. The data was collected from April 27th, 2017 – June 1st, 2018.

4.3 Source population

The source population was pregnant women whose gestational age is ≥ 24 weeks living in Gurage zones.

4.4 Study population

All randomly selected pregnant women whose gestational age is ≥ 24 weeks in selected kebeles of Butajira HDSS.

4.4.1 Inclusion criteria

All randomly selected pregnant women whose gestational age is ≥ 24 weeks registered in Butajira HDSS system. Who are available during the study period were included in the study.

4.4.2 Exclusion criteria

Pregnant women who were <24 weeks of gestational age and had a miscarriage.

4.5 Sample size

The study was conducted on 288 pregnant women. The total household size of the study participants was 1,454. Sample size was determined by using two population proportion formula calculated using Open-Epi. Using a panel data done in Ethiopia, the assumed proportion of teff consumption during the low price period is 81% (year 1994) and during the high price period is 70% (year 2009) where the price per kg changed from (2.2 to 8.67) ⁽³⁸⁾ (*Nigussie Tefera et al, 2012*)

- Level of significance = 5%
- Confidence level 95%
- P1 (Teff consumption during the low food price period)= 81%
- P2 (Teff consumption during the high food price period)= 70%
- Odds ratio =0.55
- Sample size is **262**
- Adding 10% non-response the final sample size is **288**

4.6 Sampling procedure

The sampling strategy used was a simple random sampling. The study was conducted in all kebeles of the Butajira HDSS. There are ten kebeles, one is the urban and nine are rural kebeles. The rural kebeles were stratified as lowland, midland and highland. The urban kebele is found in the midland agro ecological zone. The kebeles are Shershera bido, Dirama, Misrak meskan, Yeteker, Wurib, Bati, Dobena, Hopie, Mekakelegna and KO4. A list of ≥ 24 weeks pregnant women living in all kebeles was obtained from the HDSS. As the data from Butajira HDSS site reports, in Butajira HDSS, approximately 1,441 reproductive age women get pregnant every year where 535 of them are from the urban kebele and the other 906 are from the rural kebeles. Consequently, from the urban kebele, 107 and from the rural kebele, 181 pregnant women a total of 288 pregnant women were selected using population proportion to size formula. Sampling frame was prepared for each stratum and the samples were assigned for each stratum proportional to the number of pregnant women. Then, study subjects were selected from each stratum by using simple random sampling technique.

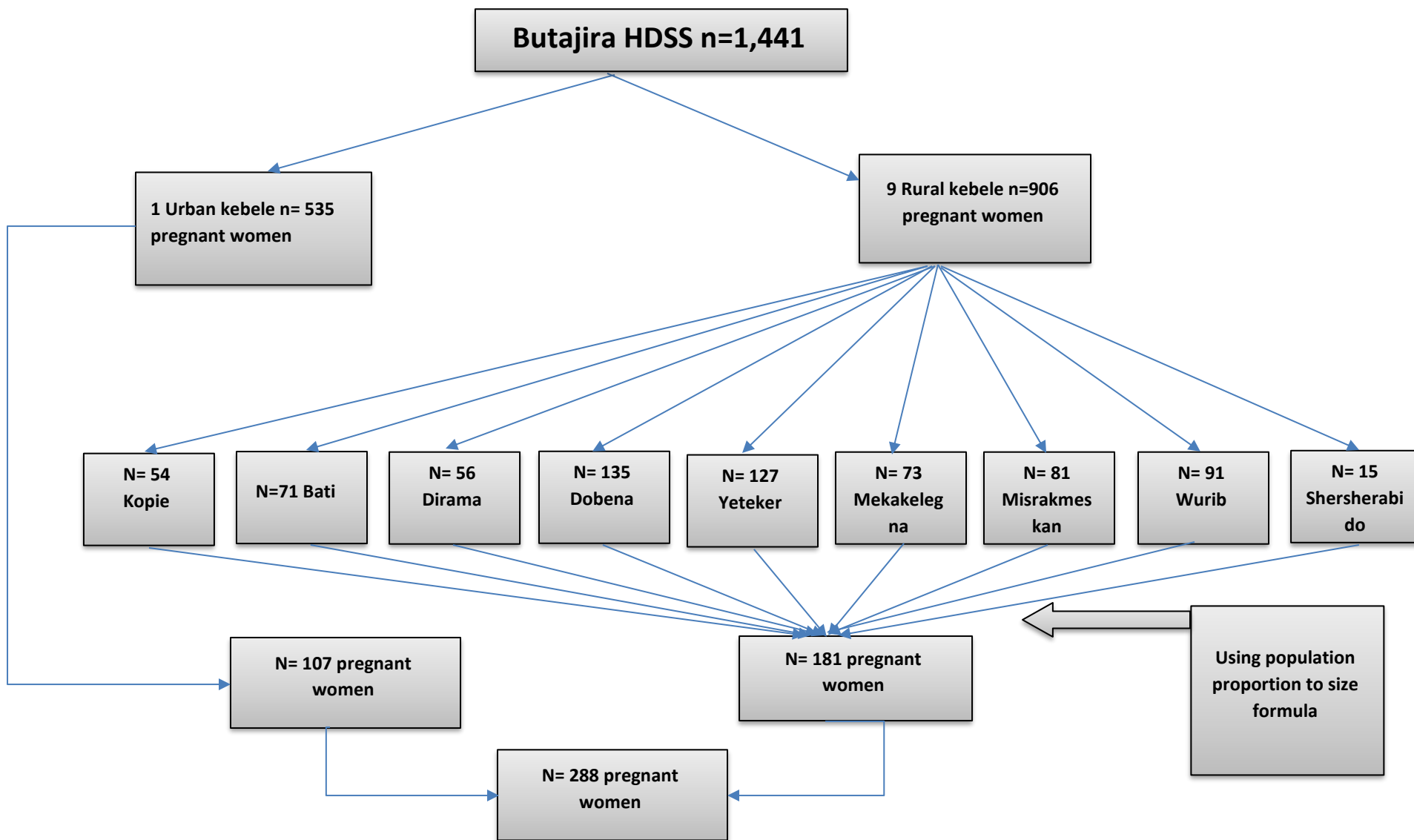


Figure 3: Sampling procedure of pregnant women in Butajira Health and Demographic Surveillance System Butajira, Ethiopia June 2017.

4.7 Study variable

4.7.1 Dependent variable

Food group intake during pregnancy

4.7.2 Independent variables

Socio demographic; age, religion, marital status, occupational status, land ownership, family size, geographical area. Pregnancy status; Gestation in weeks, planned pregnancy, ANC follow up, information about diet during pregnancy, amount of diet after pregnancy, food consumption during pregnancy and variety of diet after pregnancy. Household Consumption and Expenditure Survey (HCES): 65 food items categorized into 5 food groups, number of days consumed in 7 days, purchase (Kg), money paid (Birr), purchased for how many days, own harvest/stock, in kind.

4.8 Operational definition

- **Price elasticity:** The price elasticity of demand is the percentage change in quantity demanded divided by the percentage change in price⁽⁷⁶⁾.
- **Own price elasticity:** How consumption of a food changes with change in its own price. Shows how quantity purchased (%) of a food item changes as its price increases⁽⁷⁶⁾.
- **Cross price elasticity:** How consumption of a food changes with change in the price of another food. It shows how quantity of a food item changes (%) with respect to increase in price of another food item⁽⁷⁶⁾.

4.9 Data collection tools, measurement and procedures

4.9.1 Data collection tool and measurement

The questionnaire was adapted from Food and Agriculture Organization (FAO). The HCES tool is the best questionnaire used to assess household food consumption and expenditure of the listed food items categorized into 5 food groups. The questionnaire has three sections. These are sociodemographic questions (Section-I), Pregnancy status questions (Section-II), and household food consumption and expenditure questions (Section-III). The HCES tool used a seven-day recall period for food consumption measurement across different food items categorized in 5 food groups.

The HCES tool is the recommended approach in low and middle-income countries. The 7-day recall is used to avoid recall bias compared to 14 days recall. The HCES collected on the main modes of acquisition (food purchases, own production, and food received in kind) which clearly placed complete enumerations for consumed and not consumed. For the question on how long the household purchased/received the food item could be for a day, week, month or annual depending on the nature of the food item, the household budget cycle, and food consumption habits. To capture this, it was asked for how many days the household purchased/received the food items. Price for all food items is included in the tool since households purchase foods from different market places taking account of the affordability (low price) and accessibility (closeness of the market place).

The standard unit of measurement allowed the respondents to report in both standard and non-standard units, according to what they are most familiar with for each item reported. The data collector used standard conversion factors for all non-standard units. To minimize measurement error, it was asked for consumed food items in a household rather than asking for the food consumption share of the pregnant women only which can be challenging for the study participant to calculate. Data collection tool was prepared in English then translated to Amharic and then back to English by another person to check for consistency.

Food category selection

The HCES tool incorporates both FCS and expenditure. The HCES aims to assess the frequency with which food items are consumed during one-week time period along with their expenditure and the food items listed in 5 food groups are separately assessed for the purchase, own production and in kind.

The 65 food items specified in the recall list have quantities reported (in either kilograms or liters), enabling unit values to be calculated. The data were collected through the actual acquisition of all food items consumed by the pregnant women, which is a major advantage over inferring price data from the reported food consumption patterns of the pregnant women in order to calculate the mean food item price. Food category selection is primarily driven prioritizing the essential nutrients required during pregnancy in studying pricing effect on pregnant women living in Butajira HDSS.

Hence, the food categories had to align with nutrition data from National Nutrition Survey, based on the adequate intake standard for women (FANTA 2016), 65 food items were categorized under 5 food groups⁽⁷⁷⁾.

Table 1: Five food groups based on standard adequate intake for women in Butajira HDSS, 2017

Food Group	Food Item				
Cereals	White teff	Black teff	Barley	Wheat	Maize
	Rice	Pasta	Macaroni	Sorghum	Millet
Pulses	Lentils	Fava beans	Cow Pea	Soya bean	Haricot bean
Animal products	Egg	Milk	Yoghurt	Butter	Beef
	Chicken	Goat meat	Fish/Sardins	Mutton	Cottage cheese
Vegetables and fruits	False banana	Potatoes	Collared green	Lettuce	Ginger
	String bean	Fenugreek	Onion	Pumpkin	Carrot
	Sweet potato	Beet root	Cabbage	Tomato	Garlic
	Bulla	Water melon	Avocado	Mango	Guava
	Apple	Lemon	Pineapple	Orange	Strawberry
	Papaya	Banana			
Others	Black seed	Seasame	Safflower	Sunflower	Rapeseed
	Linseed	Peanut	Cooking oil	Sugar	Salt
	Honey	Pimento	Pepper		

Using the standard measurement of food purchased for a number of days in gram and number of days consumed in seven days; consumption per day was calculated in gram. Annual consumption of a household calculated by multiplying consumption per day, consumption in 7 days by 48 weeks.

4.9.2 Data collection procedures

4.9.2.1 Preparation for data collection

Three days before the interview, the principal investigator visited few households to collect data on common foods eaten. Since households in Butajira HDSS do not purchase from known market places, household expenditure survey was used rather than using market assessment.

4.9.2.2 Recruiting data collector

Twenty data collectors along with two supervisors were engaged to their work after 3 days of training.

4.9.2.3 Data collection

First, the participants were informed about the purpose of the research. After their consent, the data were collected following the three sections of the questionnaire.

4.10 Data processing and analysis procedures

Data were collected using ODK and exported to Microsoft Excel 2007. Data was cleaned on Microsoft excel. The analysis was done using STATA 14. The annual food consumption share for the pregnant women in a household was calculated using the standard AME approach in gram. Similarly, the purchase was converted to gram to calculate the purchase using similar measurement. The unit value was calculated for all the purchase, own production and gift/in-kind using the price data collected from the data collection. The own and cross price elasticity was calculated for Butajira HDSS and separately for the urban and rural kebeles using the AIDS model.⁽⁷⁸⁾

Compared to other demand systems, AIDS is a flexible functional form which uses independent parameter which helps to identify all kinds of elasticities developed from price independent generalized logarithmic model.

The model is widely used in applied demand analysis, because it has many unique properties.⁽⁷⁸⁾

- (a) It is an arbitrary first-order approximation to any demand system
- (b) It satisfies the axioms of choice
- (c) It aggregates exactly over consumers while still allowing non-linear Engel curves
- (d) The homogeneity and symmetry property can be tested and imposed by simple parameter restrictions and
- (e) The demand equations become linear if the translog price index is approximated e.g. by the Stone index.

Own price and cross price elasticities describe the percentage by which the demanded quantity of a food changes in response to a 1% increase in the price of the food item. The coefficient was calculated dividing the percentage change in the quantity demanded by the percentage change in the price. Marshallian (uncompensated) price elasticity measured. It measures the relationship between a change in the demanded quantity and a change in a consumer price holding total expenditure constant. It contains both the income and price effects unlike the compensated/Hicksian elasticity which only contains the price. The parameter estimates of own and cross price elasticities in both urban and rural areas were adjusted for household size, age and wealth quantile coefficients. ^(79, 80)

$$w_i = \alpha_i + \sum_{j=1}^k \gamma_{ij} \ln p_j + \beta_i \ln \left\{ \frac{m}{a(\mathbf{p})} \right\}, \quad i = 1, \dots, k$$

- **Own price elasticity:** Approves demand law (γ), **if** all food groups are negative.
 - if $\gamma < 0$ the food group is lowest price sensitive and if $\gamma > 1$ the food group is highest price sensitive.
- **Cross price elasticity:** if $\gamma > 1$ the food group is substituted and if $\gamma < 0$ the food groups complement.

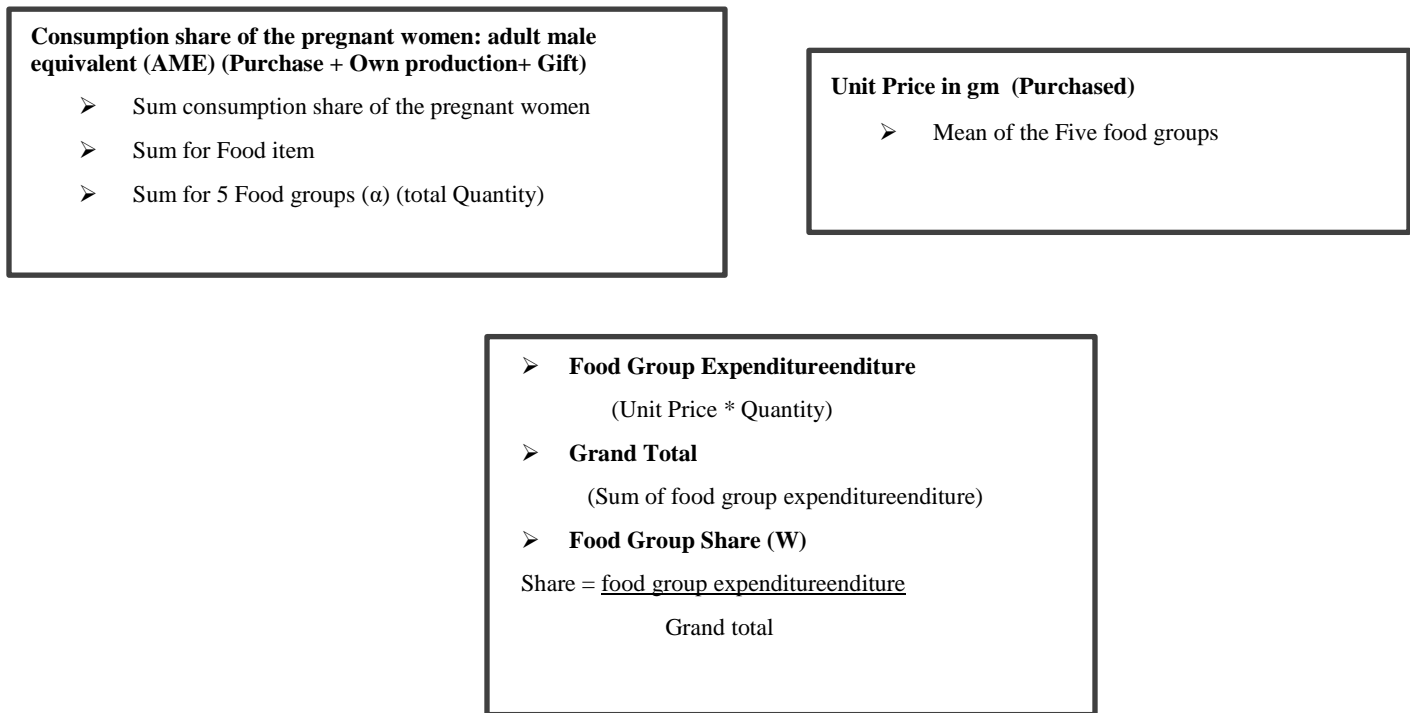


Figure 4: Data processing and analysis procedure in Butajira HDSS, 2019

4.11 Data quality management

Data collectors were trained on data collection procedure and tools for three days to be familiar with it and, the principal investigator and the data supervisor meets the data collectors and check the tablet whether it works well or not. Since the data were collected using ODK application, it makes the possibility of error during data collection. Pre-test in a comparable setup was done on non sampled pregnant women before the actual data collection started. This was done to check if the respondents are willing to participate in the study and able to answer the questions and to assess whether the questions were understandable. The unit of measurement used for the HCES was collected according to the preference of the participant's in order to minimize measurement error.

4.12 Ethical considerations

Ethical clearance was obtained from Addis Ababa University, College of Health Sciences School of Public Health Research and Ethics Committee. Informed verbal consent was obtained from each study participants before the interview after the detail process was explained for them along with benefits and possible risks. Any personal identification of the study participants were not recorded during data collection and all the information collected from the study participant was made confidential. Their right to participate or withdraw from the study was informed to the participants. All pregnant women were kindly requested to participate in the study after introducing the significance and objective of the study.

Chapter 5: Results

Two hundred eighty eight women who are ≥ 24 weeks pregnant living in 10 kebeles of Butajira HDSS were eligible for inclusion in the study. Of these, 3 of them experienced miscarriage giving a response rate of 98.9%.

5.1 Sociodemographic characteristics

The urban respondents were 16.96% and the rural respondents were 83.04%. The majority of respondents (34.6%) were within the age group of 28-30 where **SD is 5.33 years**. Regarding the religion of respondents, the majority (78.82%) were Muslim religion followers. All (100%) of the respondents were Married. Approximately half of the respondents (38.41%) attended primary education. The majority (77.16%) of the respondents were housewives. Among the participants, 70.59% do not have electricity. Majority of them (69.2%) used protected well/spring water. More than half (55.71 %) use traditional pit latrine. One quarter of the participants (25.61%) do not own a land. The number of households between 2-5 household members is 64.33 % and 6-11 household members is 35.67 %.

Table 2: Distribution of socio-demographic characteristics of the respondents among pregnant women at Butajira HDSS (n=285), Ethiopia 2019

Variable	Majority	Percentage (%)
Age	28-30	34.6
Religion	Muslim	78.8
Marital status	Married	100
Occupational status	Housewife	77.2
Land ownership	Own land	74.4
Family size	2-5	64.3
Urban / Rural respondent	Rural respondent	83%

5.2 pregnancy status of the respondent

Majority of the pregnancy was planned pregnancy (76.82 %). More than half of the participants (56.05%) were on their second trimester of pregnancy. Majority of them have a regular ANC followup (93.77%) where 44.65% see a doctor and 39.48% see a nurse. Majority of the pregnant women goes to government health centers. Less than half (28.4 %) of the pregnant women got information about their diet during the ANC followup. After pregnancy, majority of them (55.63 %) eat less than the normal diet they used to consume, where 31.49 % has not changed the amount of their diet. Less than half of the participants (40.8%) consume less varied diet than before their pregnancy.

Table 3: Distribution of pregnancy status of the respondents at Butajira HDSS (n=285) in Ethiopia, 2019.

Variable	Majority	Percentage (%)
Gestational age	2 nd trimester	56
Planned pregnancy	Planned	76.8
ANC follow up	Follow regularly	93.8
Info. About diet during ANC	No info. During ANC follow up	71.6
Amount of diet after pregnancy	Changed	68.5
Consumption during pregnancy	Less than normal diet before pregnant	55.6
Variety of diet after pregnancy	Varied diet	59.2

5.3 Intra-household dietary intake using Adult Male Equivalent (AME)

As of the standard measurement to calculate price elasticity for food intake is annual consumption, the food item intake in 7 days recall was converted to annual consumption in gram.

$$\text{Consumption per day (gram)} = \frac{\text{Gram purchased for consumption}}{\text{Number of days consumed}}$$

$$\text{Annual consumption of the household} = \text{Consum per day} \times \text{consum 7 days} \times 48 \text{ weeks}$$

After the annual food consumption of the household is calculated, the standard adult male equivalent (AME) approach was used to calculate the intra household food consumption to find the food consumption share of the pregnant women in the household. AME is the best approach used to show the energy requirement based on the household size, gender, age, physiological status such as pregnancy and lactation as a proportion of the energy requirement of an average adult male. It uses the household's total or nutrient consumption and demographic composition to calculate the energy available per AME in the household and the apparent proportion of available household foods consumed by the individual.

To calculate the AME for the pregnant women, the total number of the household was used from the Butajira HDSS, which is 1,441. The gram share of the pregnant women was calculated using the AME conversion factor.

Table 4: Adult male equivalent conversation factors for estimated calorie requirement according to age, gender and pregnancy in Butajira HDSS, Ethiopia 2019

Age (Years)	Calories (kcal)	AME conversion factor
Newborns		
0-1	750	0.29
Children		
1-3	1300	0.51
4-6	1800	0.71
7-10	2000	0.78
Men		
11-14	2500	0.98
15-18	3000	1.18
19-24	2900	1.14
25-50	2900	1.14
51+	2300	0.90
Women		
11-14	2200	0.86
15-18	2200	0.86
19-24	2200	0.86

25-50	2200	0.86
51+	1900	0.75
Pregnant women (+300kcal)		
11-14	2500	0.98
15-18	2500	0.98
19-24	2500	0.98
25-50	2500	0.98
51+	2100	0.82

After categorizing the conversion factors according to the age, sex and pregnancy status of the household, the total number of the household AME (HH AME) was calculated. Then the AME was divided by the household AME of each individual to find the individual AME (IND AME). The individual AME (IND AME) was then multiplied with the annual gram food consumption of the total household to find the pregnant women annual food consumption share (IND gram consumption).

Table 5: Annual pregnant women food consumption share in gram using AME in a household Butajira HDSS, Ethiopia 2019

No	Age	Sex	Preg women	Hhd Size	AME	HH AME (sum of AMEs)	IND AME (AME/HH AME)	Annual HHD consumption (sum of all consumed food items in gram)	Annual IND consumption (AHHDC*IND AME)
1	44	M	0	8	1.14	6.97	0.163558	1512.476	247.3777
2	37	F	1	8	0.98	6.97	0.140603	1512.476	212.658
3	18	M	0	8	0.86	6.97	0.123386	1512.476	186.6183
4	43	F	0	8	0.86	6.97	0.123386	1512.476	186.6183
5	14	F	0	8	0.86	6.97	0.123386	1512.476	186.6183
6	11	M	0	8	0.98	6.97	0.140603	1512.476	212.658
7	7	F	0	8	0.78	6.97	0.111908	1512.476	169.2584
8	2	M	0	8	0.51	6.97	0.073171	1512.476	110.669

5.4 Own and Cross price elasticity using AIDS model

To analyse the own and cross price elasticity of the food groups, this study used the most popular demand system that is the Almost Ideal Demand System (AIDS). The AIDS model has solid theoretical foundations and sufficient flexibility to capture substitution effects that are especially important in the Ethiopian context of multiple staple foods and varied food consumption pattern across different areas.

Let q_i denote the quantity of food group i consumed by a household, and define the expenditure share for food group i as $w_i = p_i q_i / m$. Applying Roy's identity to, we obtain the expenditure share equation for food group i :

$$w_i = \alpha_i + \sum_{j=1}^k \gamma_{ij} \ln p_j + \beta_i \ln \left\{ \frac{m}{a(\mathbf{p})} \right\} + \frac{\lambda_i}{b(\mathbf{p})} \left[\ln \left\{ \frac{m}{a(\mathbf{p})} \right\} \right]^2, \quad i = 1, \dots, k$$

When $\lambda_i = 0$ for all i , the quadratic term in each expenditure share equation drops out, and we are left with Deaton and Muellbauer's (1980b) original AIDS model. Thus testing $H_0 : \lambda_i = 0 \forall i$ allows us to choose easily between the original AIDS and the quadratic AIDS models.

$$w_i = \alpha_i + \sum_{j=1}^k \gamma_{ij} \ln p_j + \beta_i \ln \left\{ \frac{m}{a(\mathbf{p})} \right\}, \quad i = 1, \dots, k$$

This set of expenditure share equations requires nonlinear estimation techniques because of the price index $\ln a(\mathbf{p})$. Deaton and Muellbauer (1980b, 316) suggest replacing that price index with the approximation $\ln a(\mathbf{p}) \approx \sum_j w_j \ln p_j$,¹ resulting in a set of equations that can be fit by linear estimation techniques.

The own and cross price elasticities for Butajira HDSS in both urban and rural areas; parameter estimates were adjusted for **household size, age and wealth quantile coefficients**. Elasticity result before the coefficients shows a different result where adjusting for these coefficients was crucial to analyse own and cross price elasticities in both the urban and rural areas.

5.4.1 Uncompensated (Marshallian) Own and Cross price elasticity of Butajira HDSS

The uncompensated/ marshallian price elasticity adjusted for household size, age and wealth quantile coefficient parameter estimates was used to calculate own and cross price elasticities of Butajira HDSS. The result using the wealth quantile parameter estimate brought a difference compared to not adjusting for the coefficient.

The uncompensated price elasticity contains both the income and price effects unlike the compensated/ hicksian elasticity, which only contains the price effects which is compensated for the effect of a change in the relative income on demand. The own and cross price elasticities using the AIDS model are shown in the table below.

Table 6: Uncompensated Own and Cross Price Elasticities of Butajira HDSS, Ethiopia 2019

	AIDS Model				
	Cereals	Pulses	Animal products	Vegetables and fruits	Others
Cereals	-1.557	0.135	0.149	-0.042	0.179
Pulses	3.136	-3.947	-0.799	-1.538	-0.774
Animal products	1.096	0.041	-1.007	-0.071	-0.519
Vegetables and fruits	-0.126	-0.159	-0.158	-0.699	0.053
Others	1.724	-0.047	-0.569	0.248	-1.379

5.4.1.1 Own price elasticity of Butajira HDSS

The negativity property is satisfied for all food groups meaning, price elasticities are related to all food groups. These food groups satisfy the demand law “All own-price elasticity estimates are statistically significant at 1% level of significance”.

Based on the uncompensated/marshallian price elasticity result, high price sensitivity ($\gamma > 1$) occurred for cereals (-1.557), **pulses (-3.947)** animal products (-1.007) and others (-1.379) where the greatest sensitivity occurred for pulses (**-3.947**). Low price sensitivity ($\gamma < 0$) occurred for vegetables & fruits (-0.699).

5.4.1.2 Cross price elasticity of Butajira HDSS

As shown in the table below, the cross effects are high for pulses (3.136), animal products (1.096) and others (1.724) which are substituted by cereals showing a ($E_{ij}/>1$) result while it is poor ($E_{ij}/<1$) for other food groups. Substitution of food groups is defined as when a food group price increases demand to purchase and consume another food group increases.

Complementary food groups is defined as when a food group price decreases demand to purchase and consume another food group increases. Complementary food groups are pulses complemented with animal products, vegetables & fruits complemented with cereals, pulses and animal products, and others complemented with pulses and animal products.

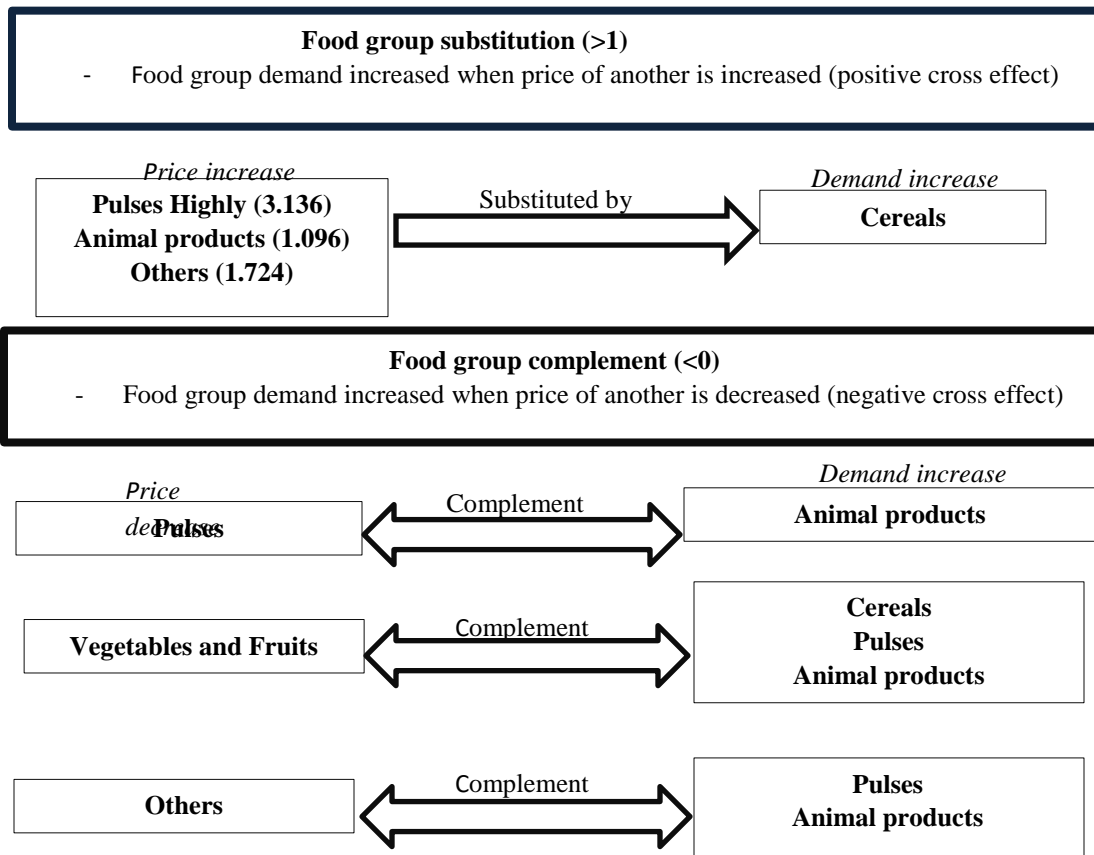


Figure 5: Cross price elasticity: compensation and substitution of food groups in Butajira HDSS, 2019

5.4.2 Uncompensated (Marshallian) Own and Cross price elasticity of urban area; Butajira HDSS

In Butajira HDSS, the urban area has 1 kebele from 10 kebeles. The AIDS model was calculated for the rural and urban areas using the HCES sample separately. The objective is to ascertain the extent to which demand responses vary between the two areas. The uncompensated/ marshallian price elasticity adjusted for household size, age and wealth quantile coefficient parameter estimates was used to calculate own and cross price elasticities of urban area of Butajira HDSS.

As of the Butajira HDSS, the result of the urban area using the wealth quantile parameter estimated brought a difference compared to not adjusting for the coefficient. The own and cross price elasticities using the AIDS model are shown in the table below.

Table 7: Uncompensated Price Elasticities of Urban kebele, Butajira HDSS, Ethiopia 2019

	AIDS Model				
	Cereals	Pulses	Animal products	Vegetables and fruits	Others
Cereals	-1.559	0.091	0.065	0.015	-0.084
Pulses	2.709	-2.692	-0.843	0.334	-1.406
Animal products	1.392	-0.064	-0.698	-0.424	-0.366
Vegetables and fruits	0.355	0.064	-0.176	-0.189	-0.428
Others	0.591	-0.253	-0.409	-0.92	-1.167

5.4.2.1 Own price elasticity of Urban Kebele, Butajira HDSS

The demand law is satisfied for all food groups (all negative). High price sensitivity ($\gamma > 1$) occurred for cereals (-1.559), **pulses (-2.692)** and others (-1.167) while the greatest sensitivity occurred for pulses (-2.692). Low price sensitivity ($\gamma < 0$) occurred for animal products (-0.698) and vegetables & fruits (-0.189) where the lowest sensitivity occurs for vegetables and fruits (-0.189).

5.4.2.2 Cross price elasticity of Urban kebele, Butajira HDSS

As shown in the table below, the cross effects are high for pulses (2.709) and animal products (1.392) where they are substituted by cereals showing a ($E_{ij} > 1$) result, while it is poor ($E_{ij} < 1$) for other food groups. Substitution of food groups is defined as when a food group price increases demand to purchase and consume another food group increases.

Food groups that complement with each other in the urban area are animal products complemented with pulses and vegetables & fruits, and others complemented with cereals, pulses, animal products and vegetables & fruits. Complementary food groups is defined as when a food group price decreases demand to purchase and consume another food group increases.

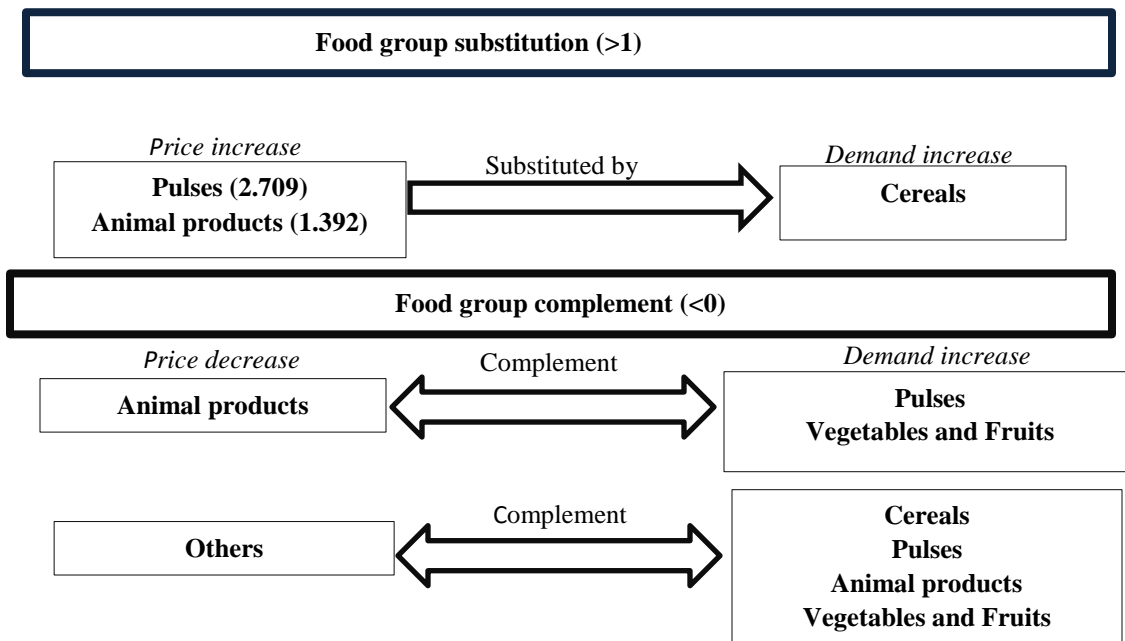


Figure 6: Cross price elasticity: compensation and substitution of food groups in Urban Butajira HDSS, 2019

5.4.3 Uncompensated (Marshallian) Own and Cross price elasticity of rural area, Butajira HDSS

In Butajira HDSS, the rural area has 9 kebeles from 10 kebeles. The uncompensated/ marshallian price elasticity adjusted for household size, age and wealth quantile coefficient parameter estimates was used to calculate own and cross price elasticities of rural area of Butajira HDSS similar to the Butajira HSDSS and urban area.

As of the Butajira HDSS and urban area, the result of the rural area using the wealth quantile parameter estimated brought a difference compared to not adjusting for the coefficient. The own and cross price elasticities using the AIDS model are shown in the table below.

Table 8: Uncompensated Price Elasticities of Rural kebele, Butajira HDSS, Ethiopia 2019

	AIDS Model				
	Cereals	Pulses	Animal products	Vegetables and fruits	Others
Cereals	-1.549	0.132	0.086	-0.052	0.1
Pulses	4.374	-4.839	-0.409	-0.499	-0.197
Animal products	1.006	0.009	-1.069	-0.149	-0.165
Vegetables and fruits	0.194	-0.017	-0.109	-0.586	-0.005
Others	0.977	-0.009	-0.213	0.003	-1.399

5.4.3.1 Own price elasticity of Rural Kebeles, Butajira HDSS

Similar to the urban area, the rural area satisfied the demand law for all food groups (all negative). High price sensitivity occurred for cereals (-1.549), **pulses (-4.839)**, animal products (-1.069) and others (1.399). Similar to the urban area and Butajira HDSS, the greatest sensitivity occurred for pulses (-4.839) and vegetables & fruits showed low price sensitivity (-0.586).

5.4.3.2 Cross price elasticity of Rural kebeles, Butajira HDSS

As shown in the table below, the cross effects are high for pulses (4.374) and animal products (1.006) where they are substituted by cereals, while it is poor for other food groups ($(E_{ij}/<1)$). Substitution of food groups is defined as when a food group price increases demand to purchase and consume another food group increases.

Food groups that complement with each other in the rural area are pulses complemented with vegetables & fruits, animal products and others. Animal products complemented with vegetables & fruits and others. Vegetables and fruits complemented with cereals and others. Complementary food groups is defined as when a food group price decreases demand to purchase and consume another food group increases.

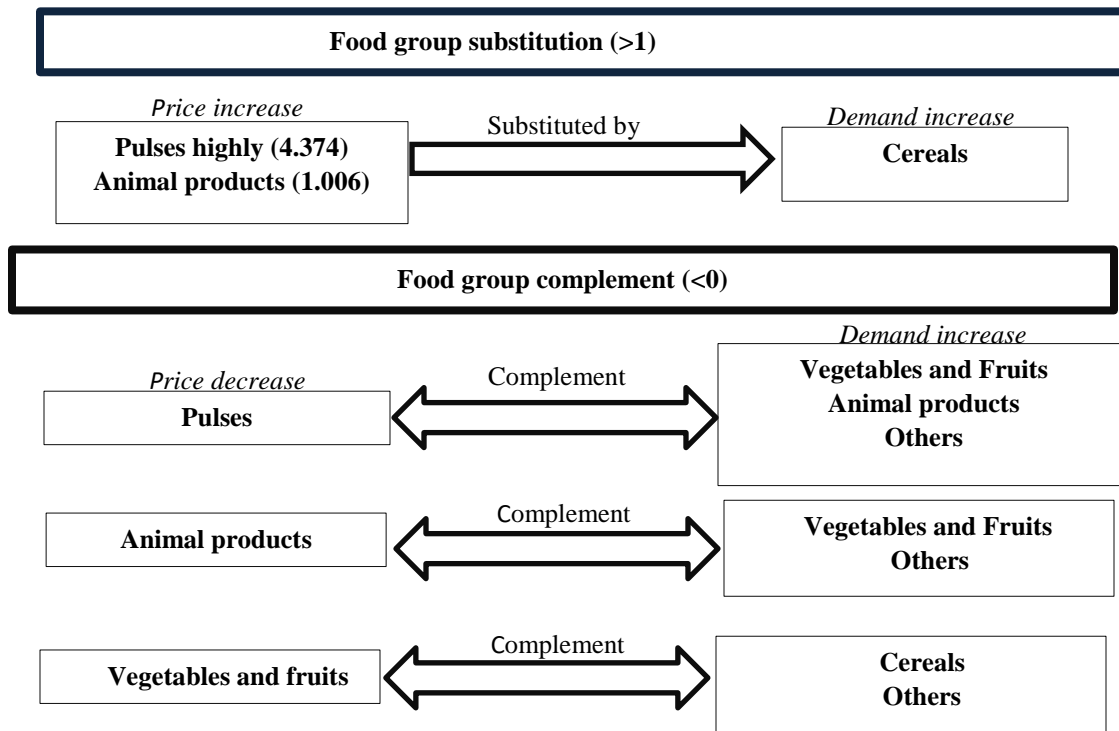


Figure 7: Cross price elasticity: compensation and substitution of food groups in Rural Butajira HDSS, 2019

Chapter 6: DISCUSSION

Using the AIDS model, the uncompensated/ marshallian price elasticity of Butajira HDSS in both the urban and rural areas was calculated adjusted for household size, age and wealth quantile coefficient parameter estimates. The result using the wealth quantile parameter estimate brought a difference compared to not adjusting for the coefficient. Own price elasticities for Butajira HDSS and in the urban and rural areas of the HDSS was statistically significant at 1% level of significance, which fulfilled the demand law.

For the own price elasticity, in Butajira HDSS, high price sensitivity (elasticity) occurred for cereals (-1.557), pulses (-3.947), animal products (-1.007) and others (-1.379). In the urban area of Butajira HDSS, high price sensitivity occurred for cereals (-1.559), pulses (-2.692) and others (-2.692). Different from the urban area, in the rural area, high price sensitivity occurred for cereals (-1.549), pulses (-4.839), animal products (-1.069) and others (1.399).

Animal products showed high price sensitivity (elasticity) in Butajira HDSS (-1.007) and rural area (-1.069) where as it is low price sensitive in the urban area (-0.698). This can be because in the Butajira HDSS and rural areas, animal consumption of animal products is luxury and majority of the population are land owners where they highly consume plant based foods such as vegetables and fruits.

In all the analytic result estimates of Butajira HDSS, urban area and rural areas, pulses showed the greatest price sensitivity (elasticity) which is -3.947, -2.692 and -4.839 respectively. The reason can be because consumption pattern of households for pulses is low and when price increases people tend to minimize their consumption. Where as the lowest price sensitivity (inelasticity) occurred for vegetables & fruits which is -0.699, -0.189 and -0.586 respectively. The reason can be because the population in the area are plant based food consumers where they prefer to consume vegetables and fruits eventhough price increases. The other reason can be because 74.4% of the population are land owners where they consume from their own production.

For the cross price elasticity, substitution of food groups is defined as when a food group price increases demand to purchase and consume another food group increases. Complementary food groups is defined as when a food group price decreases demand to purchase and consume another food group increases.

The cross effects are high for pulses (3.136), animal products (1.096) and others (1.724) which are substituted by cereals showing a ($E_{ij}/>1$) result while it is poor ($E_{ij}/<1$) for other food groups. In both the urban and rural areas, the cross effects are high for pulses with 2.709 and 4.374 estimates respectively and animal products with 1.392 and 1.006 estimates respectively.

Complementary food groups for all the Butajira HDSS, urban area and rural areas are animal products complemented with pulses and vegetables & fruits, others complemented with pulses and animal products. For both Butajira HDSS and rural areas, vegetables and fruits complemented with cereals and pulses. For both rural and urban areas, vegetables and fruits complemented with others.

A study done on a data collected by CSA using AIDS model showed that Ethiopian households significantly respond to changes in price and expenditure. Similar to this study, it signified that price elasticities of demand for cereals are approximately similar for urban and rural areas.⁽⁵⁷⁾ Another study done in rural households of Ethiopia using similar model estimated for cereals, root crops, fruits & vegetables, animal products and others showed that high food price benefit not only net-cereal sellers but also net-cereal buyers. This is because net cereal buyers could diversify income sources and benefit for high prices of other food groups such as pluses, fruits & vegetables and animal products. For this study, it was shown for animal products, pulses, vegetables & furits and others.⁽⁸¹⁾

Another study stated that there is dominance of cereals in household food budgets, compensation or loss because of price increase is much higher for cereals than for other food groups. Except in SNNPR, rural households are more affected than their urban areas. For this study, it showed similar response to price change except for animal products.⁽⁵⁸⁾

A study done in Canada emphasized that the parameter estimates on the share and unit value equations assessing the household size, region, age, gender, household structure and income are important in explaining the observed variations in household expenditure and quality choices. The own price elasticities for poultry, other meat, dairy, fruits and other food are more elastic than other food groups. Where for this study cereals, pulses, animal products and others are price elastic.

The cross price elasticities for poultry, pork, dairy, eggs, fruits, vegetables and other food are positive indicating that these food groups are net substitutes. For this study, pulses, animal products and others are highly substitutes. The study showed that beef, other meat, fish, cereal, fats and oils are negative indicating that these food groups are net complements. And for this study, animal products, pulses, vegetables & fruits and others are complements. ⁽⁸²⁾

Strengths

The data was collected for one year which can be representative of the seasonal variation of the Butajira HDSS.

Price elasticity is calculated for both Urban and Rural areas of the district which can show the dietary pattern of households depending on their geographical area, agricultural land ownership, educational status, accessibility to food items.

Intrahousehold food allocation was calculated using AME. The commonly used approach on economic analysis is dividing the meal consumed with the household size not considering the intake capacity of the individuals differently depending on their age and sex. The IND AME calculation considering the age, sex and pr status of the participant separately shows the gram intake of the pregnant women.

The AIDS model is the latest and recommended model for elasticity studies. Price for all food items is included in the tool since households purchase foods from different market places taking account of the low price, accessibility and closeness of the market place.

Limitations

The sample size was calculated using teff consumption. This was because of the lack of literatures that show consumption change of wheat due to food price elasticity. Where wheat is the highly consumed food item in Ethiopia. As of literatures show majority of the population consume wheat. of the urban is minimized to 49 because those were the only pregnant women that were living in the only one urban kebele among the 10 kebeles of the district.

Foods consumed away from home and meal participation information was not collected. For the meal participation (household and non-household members), there is no standard approach to capturing information on meal participation in households, and many surveys fail to collect that information. Smith, Dupriez, and Troubat (2014), in their survey assessment, find that only 15 of 100 surveys ask whether non-household members were present or consumed meals in the household during the recall period. The HCES used consumption of food items during the past 7 days this brings recall bias.

Zero expenditure analysis was not done since it requires massive analysis beyond the study period given for the study. The Zero expenditure analysis helps to capture the non consumed foods by the participant which can occur due to different reasons that they may be the respondent is non-consumer, non-consumer for the survey period, and potential consumer depending on the religious beliefs, health condition and other reasons the participant might have.

Chapter 7: Conclusion and recommendations

7.1 Conclusion

The result of the study shows that pregnant women living in Butajira HDSS do not increase the amount and variety of their intake. Because of high food price, they do not consume highly essential food groups such as cereals, pulses and animal source foods which include eggs, meats and dairy products. Their intake is predominantly plant based since they can grow them at home as majority are land owners.

This brings minimal nutrient intake such as carbohydrates, proteins, calcium, iron and zinc. Carbohydrates should constitute approximately 50% of the diet for most pregnant women. Carbohydrates are important for energy production and provides much of the fiber necessary to help prevent constipation and hemorrhoids. Protein is critical for ensuring the proper growth of fetal tissue, including the brain. It also helps with breast and uterine tissue growth during pregnancy. It even plays a role increasing blood supply, allowing more blood to be sent to the fetus.

Calcium is associated with an increased risk of pregnancy induced hypertension. It is important for bone and tooth formation and maintenance, and is required in nerve transmission and regulation of the heartbeat. Iron works with sodium, potassium, and water to increase blood flow. This helps ensure that enough oxygen is supplied to both the mother and the fetus. Iron deficiency anemia, especially severe and chronic anemia, is associated with a higher incidence of LBW infants and a shorter length of gestation, a higher perinatal mortality and increased maternal mortality and morbidity. Zinc intake is essential to provide extra immune support for the mother, which helps to reduce vulnerability of infection.

As a conclusion, price elasticity enforces pregnant women not to consume these very essential food groups that are crucial for pregnancy outcome and fetal healthy growth.

7.2 Recommendations

Pregnant women should increase their diet for a healthy growth of the fetus and for a healthy outcome of the fetus as a child and adult in the long run. Attention needs to be given for food price elasticities in order to lower its effect on pregnant women who are one of the vulnerable groups and target groups to eradicate intergenerational malnutrition (1,000 days).

Hospitals, government sectors, NGOs and sectors that work on women and nutrition need to strategically target pregnant women to address these by create awareness and designing feasible interventions to maximize intake of cereals, pulses and animal products for a healthy fetus.

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Chapter 9: APPENDICES

Annex 1. English questionnaire

Study information sheet

Good morning/afternoon my name is i am one of the interviewers of the study conducted by Addis Ababa university school of public health regarding food price effect on dietary intake of pregnant women among both urban and rural kebeles of Butajira HDSS. You are selected for this study by chance because you are pregnant women. You will participate if you give me your consent after understanding the purpose of the study after reading the following notes.

- The purpose of the study is to evaluate whether pregnant women get adequate diet when the food price is low.
- The purpose of the study is to evaluate whether pregnant women get adequate diet when food price is high.
- To compare the dietary intake pattern between Urban and Rural kebeles during both high and low food price markets.
- If you agree to participate in the study I will conduct an interview about your socioeconomic status, purchasing pattern of foods from a market and your dietary intake of each food items purchased.
- The result of this study will help policy makers for decision making regarding pregnant women nutrition so that you will get benefit from the intervention in the future.
- The interview might take 30 minutes and there is no risk or discomfort while participating and also there is no payment for your participation.
- Your participation is voluntary and you can skip any question that you don't want to answer and also you can ask any questions you have.
- The record of this study will be kept private. Any personal information about you will not be recorded and all the information you provided is strictly confidential.
- You can contact the principal investigator for any question or concern you have.

Name of the principal investigator_____

Phone no_____

Informed Consent form

The selected participant hears the information sheet carefully while the data collector read it.

I understood the purpose and benefit of the study. I know what I am expected to do and the relevance of the study if I participate in the data collection. I understood that my personal information; such as my name will not be registered and all my personal answers would not be transferred to the third party without my permission. I also understand that I can decide whether to participate or even withdraw from the study at any time.

My name is..... and I agree to participate in the study.

Sign.....

Household Information & Characteristics

Number	Question	Response
101.	Date of interview (dd/mm/yyyy)	<input type="text"/> / <input type="text"/> / <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
102.	Data Time Point (1-2)	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> to <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
103.	Household ID	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
104.	Kebele name	(text)
105.	Kebele Code (HDSS code)	<input type="text"/> <input type="text"/>
106.	Gote	(text)
107.	Interviewer’s ID	<input type="text"/> <input type="text"/>
108.	Supervisor’s ID	<input type="text"/> <input type="text"/>
109.	Outcome of this Interview	1. Completed 2. Incomplete

Section 1: Household and Socioeconomic Characteristics

I would like to ask you a few questions about you and your partner

No	Question	Responses	Skip
Q101	In what month and year were you born?	Month..... <input type="text"/> <input type="text"/> Don't know month 9999 Year..... <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> Don't know year..... 99	
Q 102	How old are you?	-----years old	
Q 103	What is the highest level of school you attended?	Primary (1-8) 1 Secondary(9-12) 2 College/university..... 3 Read and write 4 Illiterate 5	
Q 104	What is your religion?	Orthodox 1 Muslim 2 Protestant 3 Catholic..... 4 Other (specify) 99 _____ —	
Q 105	To which ethnic group do you belong?	Oromo..... 1 Amhrara 2 Gurage 3	

		Tigray..... 4 Afar 5 Silete 6 Other (specify) 99	
Q 106	What is your occupation?	Farmer and housewife..... 1 Housewife 2 employee/private 3 Student..... 4 Merchant..... 5 Local drink seller 6 Commercial sex worker 7 Maid servant 8 Daily laborer..... 9 Unemployed 1 0 Farmer and merchant 1 1 Other (specify) 9 9	
Q 107	What is your marital status?	Currently married 1 Separated 2 Divorced 3 Widowed..... 4 Never married 9 9	If 2,3,4,99 Go to 211

Q 108	How old is your partner?	_____years	
Q 109	What is your partner/husband educational status? (highest level of school attended)	Primary (1-8) 1 Secondary(9-12) 2 College/university..... 3 Read and write 4 Illiterate 5	
Q 110	What is your partner/husband occupation?	Farmer 1 employee/private 2 Student 3 Merchant 4 Daily laborer 5 Unemployed 6 Other (specify) 99 _____ _____	

I am going to ask you questions about your household conditions.

No	Question	Responses	Skip
Q 111	Main construction material used for the floor: CIRCLE ALL THAT APPLY	<u>Natural floor</u> Earth /sand11 dung12 <u>Rudimentary floor</u> Wood planks21 Bamboo22 <u>Finished floor</u> Polished wood or parquet31 Ceramic tiles32 Cement33	

		Carpet34 Other (specify).....99 <hr/> -	
2Q	Main construction material used for the roof: CIRCLE ALL THAT APPLY	<u>Natural roofing</u> No roof11 Thatch/leaf/mud12 <u>Rudimentary roofing</u> Plastic21 Bamboo22 Wood planks23 <u>Finished roofing</u> Corrugated iron/metal31 Wood32 Cement/concrete33 Other (specify).....99 <hr/> -	
113	Main construction material used for exterior walls: CIRCLE ALL THAT APPLY	<u>Natural walls</u> No walls11 Cane/Trunks/Bamboo/Reed12 Dirt13 <u>Rudimentary walls</u> Wood with Mud21 Stone with mud22 Card board23	

		<p><u>Finished walls</u></p> <p>Stone with lime/cement31</p> <p>Bricks32</p> <p>to 33</p> <p>Other (specify).....99</p> <p>_____</p> <p>—</p>	
114	<p>What kind of toilet facility does your household have?</p> <p>[INTERVIEWER: LIMIT TO ONE RESPONSE; IF TWO TYPES ARE MENTIONED, RECORD THE TYPE CLOSEST TO THE TOP OF THE LIST]</p>	<p><u>Flush toilet</u></p> <p>Flush to septic tank.....11</p> <p>Flush to Pit latrine12</p> <p>Flush to somewhere else13</p> <p><u>Pit latrine</u></p> <p>Traditional pit toilet.....21</p> <p>Pit latrine with slab.....22</p> <p>Pit latrine without slab.....23</p> <p>Ventilated improved pit latrine24</p> <p>Composting toilet25</p> <p>No facility/bush/field.....31</p> <p>Other (specify).....99</p> <p>_____</p>	
115	<p>What is the main source of drinking water for members of your household?</p>	<p><u>Piped water/supply water</u></p> <p>Piped inside dwelling11</p> <p>Piped to yard/plot12</p> <p>Public tap.....13</p> <p><u>Water from spring</u></p>	

	<p>[INTERVIEWER: BE SURE OF THE SOURCE OF “PIPED WATER”. IF THE ANSWER IS “PIPED WATER” CHECK THE SOURCE AND CIRCLE THE APPROPRIATE CODE]</p>	<p>Protected well/spring21 Unprotected well/spring22 Water from Dug well Protected well31 Unprotected well32</p> <p><u>Surface water</u> Pond/lake/River/stream/spring/Dam 51</p> <p>Rain water61 Tanker truck71 Vendor81 Bottled water91</p> <p>No fixed facility96</p> <p>Other (specify)99</p>	
116	<p>Tell me, please, if your home has:</p> <p>[INTERVIEWER: CIRCLE ALL THAT APPLY]</p>	<p>Electricity1 Watch/clock.....2 Radio3 Television4 Mobile Telephone5 House Phone.....6 Refrigerator Chair8 Electricity in the house9 Electric Mitad10 Kerosene Lamp/pressure11 Solar12</p>	

		Flash light that works with battery .13	
117	<p>What type of fuel does your household mainly use for cooking?</p> <p>[INTERVIEWER: ALLOW MULTIPLE ANSWERS]</p>	<p>Electricity1</p> <p>LPG/natural gas.....2</p> <p>Biogas.....3</p> <p>Kerosene.....4</p> <p>wood.....5</p> <p>Charcoal6</p> <p>Straw/shrubs/grass.....7</p> <p>Straw/shrubs/grass Dunowng.....8</p> <p>Agricultural crop9</p> <p>Other (specify).....10</p> <p>_____</p>	
118	Do you have a separate room that is used as a kitchen?	<p>No.....1</p> <p>Yes.....2</p>	
119	<p>Does any member of the household own the following?</p> <p>[INTERVIEWER: CIRCLE ALL THAT APPLY]</p>	<p>Bicycle.....1</p> <p>Motorcycle/scooter/Bajaj2</p> <p>Animal drawn cart.....3</p> <p>Car/Truck4</p>	
120	Does any member of the household own any cropland?	<p>Yes.....1</p> <p>No2</p>	

21	<p>How many (LOCAL UNITS) of agricultural land do members of this household own?</p> <p>LOCAL UNITS _____</p> <p>(SPECIFY)</p>	<p><input type="text"/> <input type="text"/> Local units </p> <p>Don't have00</p>	
122	<p>Does this household own any livestock, herds, other farm animals or poultry?</p>	<p>Yes1</p> <p>No.....2</p>	
123	<p>How many of the following animals do you keep? (INTERVIEWER:IF HOUSEHOLD DOES NOT OWN A PARTICULAR ITEM, RECORD "00" AGAINST THAT ITEM.)</p>	<p>a) Milk cows, oxen or bulls __ __ </p> <p>b) Chickens __ __ </p> <p>c) Goats __ __ </p> <p>d) Sheep __ __ </p> <p>e) Horses, donkey, or mule __ __ </p> <p>f) Beehives __ __ </p>	

Section 2: Woman Current Health Status & Pregnancy

	Questions	Responses	Skip
201	<p>At the time you became pregnant with the index delivery, did you plan to get pregnant, did you want to wait until later, OR did you NOT WANT to have any more children?</p>	<p>Planned1</p> <p>Later.....2</p> <p>Not want more children.....3</p>	
202	<p>For how many weeks have you been pregnant? (prompt with date of last menstrual period)</p>	<p>_____ weeks</p> <p>Don't Know 99</p>	

203	Did you see anyone for antenatal care during this pregnancy?	Yes 1 No 0 → Go to 462 Don't know 99 → Go to 462	
204.	Whom do you see? Any one else?	HEALTH PERSONNEL Doctor1 Nurse..... 2 Midwife 3 Health officer 4 Health extension worker.....5 Other person Traditional birth attendant 6 Other 7 _____ (specify)	

205.	<p>Where did you receive Antenatal care during this pregnancy?</p> <p>Anywhere else</p>	<p>HOME</p> <p>Her home 1</p> <p>Other home 2</p> <p>PUBLIC SECTOR</p> <p>Government hospital3</p> <p>Government health center/station.....4</p> <p>Government health post5</p> <p>Other public sector6</p> <p>_____ (specify)</p> <p>NGO</p> <p>Health facility 7</p> <p>Other NGO health facility 8</p> <p>_____ (specify)</p> <p>PRIVATE</p> <p>Private hospital..... 9</p> <p>Private clinic 10</p> <p>Other private medical sector 11</p> <p>_____ (specify)</p>	
206.	<p>How many months pregnant were you when you first received antenatal care for this pregnancy?</p>	<p>Months [____][____]</p> <p>Months</p> <p>Don't know 99</p>	
207.	<p>How many times did you receive antenatal care during this pregnancy?</p>	<p>Number of times [____]</p> <p>Don't know 99</p>	
207. C	<p>During (any of)your Antenatal care visit(s) were you told about the signs of pregnancy complications or danger sign of pregnancy?</p>	<p>Yes 1</p> <p>No 0 → Go to 448D</p> <p>Don't know 99 → Go to 448D</p>	

207. D	Which signs of pregnancy complications were you told about? (more than one answer is possible)	Vaginal bleeding. 1 Vaginal gush of fluid. 2 Severe headache. 3 Blurred vision. 4 Fever 5 Abdominal pain. 6 Convulsion 7 Other 8 _____ (specify)	
207. E	During any of your antenatal visit were you told about birth preparedness plan?	Yes 1 No 0 Don't know 99	
208.	As part of your antenatal care during this pregnancy, were any of the following done at least once:))))	YES NO a) BP1 2 b) URINE1 2 c) BLOOD1 2 d) Information about what to eat 1 2	
209	During this pregnancy, were you given an injection in the arm or shoulder to prevent the baby from getting tetanus, that is, convulsions after birth?	Yes1 No0 → Go to 451 Don't know 99 → Go to 451	
210	During this pregnancy, were you given or did you buy any iron tablets?	Yes 1 No 0 → Go to 458 Don't know 99 → Go to 458	

211	During this pregnancy, did you take any drug for intestinal worms?	Yes 1 No 0 Don't know 99	
212	During this pregnancy, did you have your weight measured?	Yes 1 No 0 Don't know 99	
213	During this pregnancy, did you have your height measured?	Yes 1 No 0 Don't know 99	
214	During this pregnancy, did you have your abdomen examined?	Yes 1 No 0 Don't know 99	
215	During this pregnancy, did you have a Sonogram or ultrasound?	Yes 1 No 0 Don't know 99	

MATERNAL MEDICAL DISORDERS

216	Known Cardiac disease?	Yes 1 No 0 Don't know 99	
217	Known diabetes disease?	Yes 1 No 0 Don't know 99	
218	Known thyroid disease?	Yes 1 No 0 Don't know 99	
219	Are you currently sick of Malaria disease?	Yes 1 No 0 Don't know 99	
220	Within the last 3 months were you diagnosed with Malaria?	Yes 1 No 0 Don't know 99	

221	Other known disease?	Yes 1 No 0 Don't know 99	
222	How has the amount of your food you eat changed after you became pregnant?	1. I eat more food than normal 2. I eat less food than normal 3. The amount of food I eat has not changed 4. Don't know	
223	How has the variety of foods in your diet changed after becoming pregnant?	1. I eat more types of food than normal 2. I eat less types of food than normal 3. I eat the same foods as normal 4. Don't Know	

Section 3: household food consumption and expenditure survey

Food items purchased and their expenditure (During the last 7 days)

S/N	Food groups	How many days (in the last 7 days) did you consume this food?	How much was purchased? (kilogram) How much was paid? (in Birr) For how many days/months w as purchased?	Did you consume this food from your own harvest or your own stock? How much? (kilogram)	Did you receive this food as a GIFT, a LOAN, as WAGE IN KIND or as BARTER? How much? AMOUNT CONSUMED IN THE LAST WEEK (kilogram)
-----	-------------	---	--	---	--

							If they did not receive any food, move on to the next question	
		Days	Amount (kg)	Days/months	Total Expenditure (Birr)	Amount (kg)	Amount received (kg)	Amount used (kg)
	CEREALS							
1	Teff (white)							
2	Teff (black)							
3	Barley							
4	Wheat							
5	Maize							
6	Sorghum							
7	Millet							
8	Rice							
9	Pasta							
10	Macaroni							
	PULSES							
11	Lentils							
12	Fava beans							
13	Cow Pea							
14	Soya bean							
15	Haricot bean							
	ANIMAL PRODUCTS							
16	Beef							
17	Mutton							
18	Chicken							

19	Goat Meat							
20	Fish (Sardins)							
21	Egg							
22	Milk							
23	Yoghurt							
24	Butter							
25	Cottage cheese							
	FRUITS AND VEGETABLES							
26	False banana							
27	Potatoes							
28	Collared green							
29	Lettuce							
30	Ginger							
31	Cabbage							
32	Garlic							
33	String bean							
34	Fenugreek							
35	Onion							
36	Pumpkin							
37	Carrot							
38	Tomato							
39	Bulla							
40	Sweet potato							
41	Beet root							
42	Banana							
43	Orange							
44	Pineapple							
45	Lemon							
46	Strawberry							

47	Apple							
48	Water melon							
49	Avocado							
50	Mango							
51	Guava							
52	Papaya							
	OTHERS							
53	Sugar							
54	Salt							
55	Cooking Oil							
56	Pimento							
57	Pepper							
58	Honey							
59	Black seed							
60	Seasame							
61	Safflower							
62	Sunflower							
63	Rapeseed							
64	Linseed							
65	Peanut							

Annex 2. Amharic questionnaire

የመረጃ መስጫ ቅጽ

ይህ ቅጽ ለጥናቱ ተሳታፊዎች መረጃን ከመቀበል በፊት የሚነበብ ቅጽ ነው።

ስሜ ----- ይባላል። በአዲስ አበባ ዩንቨርሲቲ በ ህብረተሰብ ጤና አጠባበቅ ትምህርት ክፍል ለሚመራው ስለ ምግብ ዋጋ በነፍሰጡር እናቶች ላይ ያለውን ተጽእኖ በተመለከተ ለምሳሌ ጥናት የመረጃ ሰብሳቢ ነኝ። እርስዎ በዚህ ጥናት ተሳታፊ እንዲሆኑ ተመርጠንዎታል። ይህም በከተማው ያሉ ነፍሰጡር እናቶችን ሁሉ ያካተተ ስለሆነ ነው እርሶን ለመጠየቅ የመጣኑ። ጥናቱ ውስጥ የምትሳተፉት የሚከተለውን መረጃ ከሰማችሁና ከተስማማችሁ ብቻ ነው።

1, የጥናቱ ዋና አላማ፡

- የምግብ ዋጋ ዝቅ ባለ ጊዜ የነፍሰጡር እናቶች የአመጋገብ ስርዓት በቂ መሆኑን እና አለመሆኑን ለማጥናት ነው።
- የምግብ ዋጋ ከፍ ባለ ጊዜ የነፍሰጡር እናቶች የአመጋገብ ስርዓት በምን ያህል መልኩ እንደሚቀየር ለማጥናት ነው።

- በከተማ እና በገጠር ያሉ ነፍሰጡር እናቶች የምግብ ዋጋ ከፍ ባለ እና ዝቅ ባለ ጊዜ ያላቸውን የአመጋገብ ስርአት ልዩነት ለማጥናት ነው።

2. እኔ የምጠይቅዎት ነገሮች: ጥናቱ ውስጥ ለመሳተፍ ከተስማሙ ከ 30-40 ደቂቃ ያህል ከ እርስዎ ጋር ቃለመጠይቅን አካሄዳለሁ፡፡ ቃለመጠይቁ ስለ እርስዎ፣ ስለ ቤቶዎና ስለእርስዎ የትላንት እና ሰባት ቀን በፊት የነበሮትን አመጋገብ ያካትታል፡፡ ተሳትፎዎ በጣም ይደገፋል፡፡

3. የጥናቱ ጥቅምና ችግር: የዚህ ጥናት ውጤት መንግስትንና ሌሎች ጤና አጠባበቅ ላይ የሚሰሩ አካላት የምግብ ዋጋ ልዩነት እና ነፍሰጡር እናቶች የአመጋገብ ስርአት ለውጥ በተመለከተ ፖሊሲ እንድቀርቡ ይረዳል፡፡ ከሚቀረፀው ፖሊሲ ነፍሰጡር እናቶችን ሊጠቅም ይችላል፡፡ ጥናቱ ውስጥ በመሳተፍዎ የምክፈሎት ክፍያ የለም፡፡ እንዲሁም ለቃለመጠይቁ ከምናጠፋው ጊዜ በቀር የምትፈሩት አደጋ ወይም ችግር አይኖርም፡፡

4. ሚስጥራዊናት: እርስዎ የሰጡን መረጃ ሁሉ በሚስጢር ይያዘል፡፡ አንድም የግልዎ መረጃ አይፀፍም፡፡ ለዚህ ጥናት እርስዎ የሰጡት መረጃ በግል ይያዘል፡፡ የጥናቱን ውጤት ለሌሎች አካላት ገለጻ በምናደርግበት ጊዜ እንኩዋን እርስዎን እንድያወቁ የምያስችል መረጃ አይፀፍም፡፡ ለጥናቱ የተሰበሰበ መረጃ ቁልፍ ባለው ፋይል ውስጥ ይቀመጣል፡፡ ከአጥኚው በቀር ሌላ ሰው ሊያገኘው አይችልም፡፡

5. ተሳትፎዎ ፍቃደኝነት ላይ የተመሰረተ ነው: ጥናቱ ውስጥ ተሳትፎዎ ፍቃደኝነት ላይ የተመሰረተ ስለሆነ ጥናቱ ውስጥ ለመሳተፍዎ ሆነ መመለስ የማይፈልጉትን ጥያቄ ለመመለስ አይገደዱም፡፡ የምትጠየቁት ጥያቄ ካልተሟላ ላለመመለስ መብት አሎት፡፡ እንዲሁም ከጥናቱ ውስጥ ለመውጣት ከፈለጉ በማንኛውም ሳኦት አቆጣጠር መውጣት ይችላሉ፡፡

6. ጥያቄ ካሉት: ጥናቱን በተመለከተ ጥያቄ ካለዎት አጥኚውን በስልክ ማግኘት ይችላሉ፡፡ ጥያቄዎን በተመለከተ ግልፅ ያልሆነ ነገር ካለ እኔን በማንኛውም ጊዜ መጠየቅ ይችላሉ፡፡

የአጥኚዎ ስልክ: 0912460136

የስምምነት ቅፅ

እኔ የጥናቱ ተሳታፊ ሆኜ የተመረጡኩ የመረጃ ቅፅ ሲነበብ በጥንቃቄ አዳምጬአለሁ፡፡ የጥናቱን ዋና አላማ፣ ጥቅምና ችግር እንዲሁም ከእኔ ምን እንደሚጠበቅ ተረድቻለሁ፡፡ የግሌ መረጃ እንደማይፀፍና እኔ የሰጠሁባቸው መረጃዎች ለሦስተኛ ሰው ተላልፈው እንደማይሰጡ ተረድቻለሁ፡፡ ጥናቱ ውስጥ ለመሳተፍ መወሰን እንደምችል ና በፈለኩት ጊዜ ጥናቱን አቋርጬ መተው እንደምችልም ተረድቻለሁ፡፡ ስለዚህም ጥናቱ ውስጥ ለመሳተፍ ተስማምቻለሁ፡፡ ይህንንም በፈርማዬ አረጋግጣለሁ፡፡

የተሳታፊው ፍርማ _____

ክፍል 1: አጠቃላይ የቤት መረጃ እና መለያ

መጠይቅ

ቁጥር	ጥያቄ	መልስ	የመለያ ስም
122	የመጠይቅ ቀን (ቀን/ወር/ዓ.ም)	<input type="text"/> / <input type="text"/> / <input type="text"/>	HDATEINT
123	የመጠይቅ ሰዓት	<input type="text"/> : <input type="text"/> ሰዓት <input type="text"/> : <input type="text"/>	HDTIMEPT
124	የቤት መለያ	<input type="text"/>	HHID
125	የቀበሌ ስም		HKEBELE
126	የቀበሌ መለያ (HDSS ኮድ)	<input type="text"/>	HKEBELECODE
127	ጎጥ		HGOTE
128	የቃለ መጠይቅ አቅራቢው መለያ	<input type="text"/>	HID1
129	የሱፐርቫይዘር መለያ	<input type="text"/>	HSID
130	የቃለ መጠይቁ ውጤት	4. የተሟላ 5. ያልተሟላ 6. ፈቃደኛ ያልሆኑ	HINTOUT

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ስለ እርሶ እና ስለ ባለቤቶች የተወሰነ ጥያቄ ልጠይቆት አወዳለሁ

ቁጥር	ጥያቄ	መልስ	የመለያ ስም
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203.	የተማሩት ከፍተኛ የትምህርት ደረጃ የትኛው ነው?	የመጀመሪያ ደረጃ(1-8)..... 1 ሁለተኛ ደረጃ (9-12) 2 ኮሌጅ/ዩኒቨርሲቲ 3 ማንበብ እና መጻፍ 4 ያልተማረ 5	HEDUTION
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205.	የየትኛው ብሄረሰብ አባል ናት?	ኦሮሞ 1 አማራ 2 ጉራጌ 3 ትግራይ 4 አፋር 5 ስልጤ 6 ሌላ (የገለጹ)..... 99 _____	WETHNIC
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209.	የባለቤቶች ከፍተኛ የትምህርት ደረጃ የትኛው ነው?	የመጀመሪያ ደረጃ(1-8)..... 1 ሁለተኛ ደረጃ (9-12) 2 ኮሌጅ/ዩኒቨርሲቲ 3 ማንበብ እና መጻፍ 4 ያልተማረ 5	PAEDCUATI
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ቁጥር	ጥያቄ	መልስ	የመለያ ስም
211.	ለቤቱ የወለደ ስራ በዋነኛነት የተጠቀሙት የግንባታ እቃ ምንድን ነው? የተሰራበትን ሁሉ ያክብቡ	<u>ባህላዊ ወለደ</u> አፈር 11 የከብት ውዳቂ 12 <u>ያላለቀ ወለደ</u> የእንጨት ድርድር 21 ቀርከሀ/አገዳ/ጨፈቃ 22 <u>ዘመናዊ ወለደ</u> ዘመናዊ ጣውላ 31 ሴራሚክ 32 ሲሚንት 33 ምንጣፍ 34 ሌላ (ይገለጽ)..... 99	HFLOOR

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221.	ከተዘረዘሩት የእንስሳ መሀል የቤተሰቡ አባል ምን ያህል አለው (የቤተሰቡ አባል እንስሳ የሌለው ከሆነ በሰጥን ውስጥ 00 ይጻፉ)	a) የወተት ላም፣ በሬ፣ ኮርማ _ _ b) ዶሮ _ _ c) ፍየል..... _ _ d) በግ..... _ _ e) ፈረስ፣ አህያ፣ በቅሎ _ _ f) የጎብ ቀፎ _ _	HCOWS HCHICEKEN HGOATS HSHEEP HHORISE HBEEHIVES
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ተ.ቁ	ጥያቄ	መልስ	
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<p>305</p>	<p>በዚህ የእርግዝና ወቅት የቅድመ ወሊድ (ለእርጉዞች የሚደረግ) ምርመራ ያገኙት የት ነበር? ሌላስ?</p>	<p>ቤት በራሳቸው ቤት1 ሌላ ሰው ቤት 2</p> <p>የመንግሥት ሕክምና ተቋም ሆስፒታል 3 ጤና ጣቢያ 4 ጤና ኬላ 5 ሌላ የመንግሥት 6 _____ (ይገለጽ)</p> <p>መንግሥታዊ ያልሆነ የጤና ተቋም የጤና ተቋም 7 ሌላ መንግሥታዊ ያልሆነ የጤና ተቋም 8 _____ (ይገለጽ)</p> <p>የግል ሕክምና ተቋም' የግል ሆስፒታል9 የግል ክሊኒክ 10 ሌላ የግል 11 _____ (ይገለጽ)</p>	
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307 .I	<p>ለቅድመ ወሊድ ምርመራ በሚሄዱበቸው (በማናቸውም ጊዜ) ለሙሉ ስለሚደረግ ቅድመ ዝግጅት (እቅድ) ተነግረዎት ነበር?</p>	<p>አዎ.....1 አልተሰጠኝም0 ወደ ጥያቄ 449 አላውቅም..... 99</p>	
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308	<p>በዚህ እርግዝና ጊዜ ከዚህ በታች ከተዘረዘሩ ምርመራዎች የቅድመ ወሊድ ምርመራ አካል ሆነው ቢያንስ ለአንድ ጊዜ ተደርጎልዎ ያውቃል?</p> <p>a) የደም ግፊትዎን ተለክተው ነበር? b) የሽንት ናሙና ሰጥተው ነበር? c) የደም ናሙና ሰጥተው ነበር?) ማንኛውም የጤና ባለሙያ ምን መመገብ-ብ እንዳለብዎት ነግረዎት ነበር?</p>	<p>a) የደም ግፊት 1 አዎ 2 የለም b) ሽንት 1 አዎ 2 የለም c) የደም ናሙና 1 አዎ 2 የለም d) ስለተመጣጠነ ምግብ 1 አዎ 2 የለም</p>	
309	<p>በዚህ እርግዝና ወቅት ህፃኑን ከመንጋጋ ቆልፍ በሽታ ለመከላከል ቴታነስ የሚባል ክትባት በክንድዎ ወይም በትከሻዎ ላይ ተወግተው ነበር?</p>	<p>አዎ.....1 አልተሰጠኝም0 ወደ ጥያቄ 452 አላውቅም..... 99</p>	
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311	<p>በዚህ የእርግዝና ወቅት ይህንን የቴታነስ ክትባት ለምን ያህል ጊዜ ወስደዋል?</p>	<p>[] ጊዜ</p>	
312.	<p>በዚህ እርግዝና ወቅት የደም ማነስ ክሊን ተሰጥቶዎት ወይም ገዝተው ነበር?</p>	<p>አዎ.....1 አልነበረም.....0 ወደ ጥያቄ 459 አላውቅም..... 99</p>	
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328	በአሁን ሰዓት ላይ በወባ በሽታ ተይዘዋል (በሀኪም የተረጋገጠ)?	አዎ.....1 አልያዘኝም.....0 አላውቅም..... 99	
329	በባለፈው ሶስት ወር ውስጥ የወባ በሽታ ይዘት ያውቃል?	አዎ.....1 አልያዘኝም.....0 አላውቅም..... 99	
330	ሌላ የታወቀ በሽታ አለብዎት?	አዎ.....1 የለም0 አላውቅም..... 99 አዎ ካሉ ይገለጹ-----	

ክፍል 4 : የግል እርጅ መሬት እና የንብረት ምጣይቅ

		ከተዘረዘሩት ንብረት መሀል በአሁን ሰአት በቤት ውስጥ ካሉት የቤተሰብ አባላት መሀከል በንብረትንት ያለው አለ? 501
ተግባር መለያ	ለገቢ ምንጭ የሚውል ንብረት	
ሀ	የእርጅ መሬት (ጥማድ መሬት)	አዎ.....1 አይደለም.....2 → ንብረት ለ
ለ	ትልልቅ ከብቶች (በሬ፣ የቀንድ ከብት)	አዎ.....1 አይደለም.....2 → ንብረት ሐ
ሐ	ትንንሽ እንስሳት (ፍየል፣ በግ)	አዎ.....1 አይደለም.....2 → ንብረት መ
መ	ዶሮ	አዎ.....1 አይደለም.....2 → ንብረት ሠ
ሠ	የእርጅ መሳሪያ፡ (በህላዌ የእርጅ መሳሪያ፡ የእጅ መሳሪያ፣ በእንስሳ የሚሰራ ማረጃ)	አዎ.....1 አይደለም.....2 → ንብረት ረ
ረ	የእርጅ መሳሪያ፡ (ዘመናዊ የእርጅ መሳሪያ፡ ትራክተር፣ የሀይል መቆጣጠሪያ፣ ታንደም ፓምፕ)	አዎ.....1 አይደለም.....2 → ንብረት ሻ
ሻ	ከእርጅ መሳሪያ ውጪ የሆነ ንብረት፡ (በፀሀይ ብርሀን የሚሰራ ቻርጅር (ሶላር)፣ የስፊት ማሽን፣ የመጥመቂያ መሳሪያ፣ መጥበሻ)	አዎ.....1 አይደለም.....2 → ንብረት ቀ
ቀ	ቤት እና ሌላ ንብረት	አዎ.....1 አይደለም.....2 → ንብረት በ
በ	ትልቅ ዘላቂ የሆኑ እቃዎች (ፍሪጅ፣ ቲቪ፣ ሰፋ)	አዎ.....1 አይደለም.....2 → ንብረት ተ
ተ	ትንሽ ዘላቂ የሆኑ እቃዎች (ሬዲዬ)	አዎ.....1 አይደለም.....2 → ንብረት ቸ
ቸ	ተንቀሳቃሽ ስልክ	አዎ.....1 አይደለም.....2 → ንብረት ኀ
ኀ	ለእርጅ የሚውል ለሌላ አገልግሎት የሚውል መሬት (ቁራጭ መሬት፣ ለመኖሪያ ወይም ለሌላ ስራ (ለግጥሽ የሚውል መሬት)	አዎ.....1 አይደለም.....2 → ንብረት ነ
ነ	ከበታ በታ መንቀሳቀሻ (ብስክሌት፣ ሞተር ሳይክል፣ መኪና፣ ባጃጅ፣ጋሪ)	አዎ.....1 አይደለም.....2 → 308

ክፍል 5. የምግብ ዋጋ እና አጠቃቀም

የቤተሰብ ብዛት

አጠቃላይ ቁጥር	ወንድ ከ18 አመት በላይ	ወንድ ከ18 አመት በታች	ሴት ከ18 አመት በላይ	ሴት ከ18 አመት በታች

የምግብ-ብ አጠቃቀም

		ባለፈው ሳምንት (በ7 ቀን ውስጥ) ይህንን ምግብ ለምን ያህል ጊዜ ተመግበዋል	ምን ያህል ነበር የተገዛው (ኪ.ግ)? ምን ያህል ብር ፈጀ (ብር)? ለምን ያህል ጊዜ (ቀን/ወር) ነበር የተገዛው?			የህንጻ የምግብ አይነት ከቤተሰቡ ምርት/እርሻ ተጠቅመው ነበር? ምን ያህል (ኪ.ግ)?	የህንጻ የምግብ አይነት በስጦታ፣ በክፍያ፣ በብድር፣ ሙልክ ተቀብለዋል? ምን ያህል (ኪ.ግ)? ምን ያህሉን ለምግብነት አውለውታል (ኪ.ግ)?	
			መጠን (ኪ.ግ)	ለምን ያህል ቀን/ወር	አጠቃላይ ወጪ (ብር)	መጠን (ኪ.ግ)	ምን ያህል መጠን ተቀበሉ (ኪ.ግ)	ምን ያህል መጠን ተጠቀሙ (ኪ.ግ)
	-----ቀን	601.	602.	603.	604.	605.	606.	607.
	ጥራጥሬ	DAYSCON	AMN TKG	AMNT DY	TEBIR R	OWNCON	GFTCON	AMNTUSD
1	ነጭ ጤፍ							
2	ቀይ ጤፍ							
3	ገብስ							
4	ስንዴ							
5	በቆሎ							
6	ማሽላ							
7	ዘንጋዳ							
8	ሩዝ							
9	ፓስታ							
10	ሞከሮኒ							
	የምግብ እህሎች							
11	ምስር							
12	ባቄላ							
13	አተር (አኩሪ አተር)							
14	ሸንበራ							
15	ቦሎቄ							
	የስጋ ተዋፅኦ							
16	ከብት ስጋ							
17	የበግ ስጋ							
18	የዶሮ ስጋ							
19	የፍየል ስጋ							
20	አሳ/ሰርዲን							
21	ወተት							
22	እርጎ							
23	ቅቤ							

24	እንቁላል							
25	አይብ							
	ስራ ስር እና ፍራፍሬ							
26	ቆጮ							
27	ድንች							
28	ጎመን							
29	ሰላጣ							
30	ዝንጅብል							
31	ጥቅል ጎመን							
32	ነጭ ሽንኩርት							
33	ፎሶሊያ							
34	አብሽ							
35	ሽንኩርት							
36	ዱባ							
37	ካሮት							
38	ቲማቲም							
39	ቡላ							
40	ስኳር ድንች							
41	ቀይ ስር							
42	ሙዝ							
43	ብርቱካን							
44	አናናስ							
45	ሎሚ							
46	እንጆሪ							
47	አፕል							
48	ሃብሃብ							
49	አሸካዶ							
50	ማንጎ							
51	ዘይቱን							
52	ፓፓያ							
	ሌላ							
53	ኑግ							
54	ሰሊጥ							
55	ደቃቃ ሱፍ							
56	ሱፍ							
57	ጎመን ዘር							
58	ተልባ							
59	ለውዝ							
60	ስኳር							
61	ጨው							
62	የምግብ ዘይት							
63	ቃርያ							
64	በርበሬ							
65	ማር							

Annex 3. Expenditure and expenditure share (W) of each food items

Variable	Obs	Mean	Std. Dev.	Min	Max
expenditure_lentilpurchase	289	66.56572	164.2158	0	1135.543
expenditure_lentilown	289	0	0	0	0
expenditure_lentilgift	289	14.42225	174.3752	0	2339.947
Lenil total _expenditure	289	80.98798	235.4714	0	2339.947
Favabean total consumption	289	14334.61	110589.3	0	1728000
Favabean price	289	.0045965	.0095687	0	.045
expenditure_favabean purchase	289	63.29185	181.0938	0	1692.48
expenditure_favabean own	289	147.9943	2098.847	0	35314.96
expenditure_favabeab gift	289	66.1901	827.7409	0	12360.24
Favabean total _expenditure	289	277.4762	2262.246	0	35314.96
Cowpea total consumption	289	2817.277	12844.51	0	177120
cowpeaprice	289	.0041171	.011053	0	.06667
expenditure_cowpeapurchase	289	62.3842	222.8706	0	1771.2
expenditure_cowpeaown	289	0	0	0	0
expenditure_cowpeagift	289	.5175734	8.798747	0	149.5787
cowpeatotal _expenditure	289	62.90177	222.8989	0	1771.2
soyabeantotalconsumption	289	387.0371	2537.505	0	33600
soyabeanpr~e	289	.0007751	.003995	0	.03
expenditure_soyabeanpurchase	289	7.656273	50.47143	0	672
expenditure_soyabean	289	0	0	0	0
expenditure_soyabeangift	289	0	0	0	0
soytotal _expenditure	289	7.656273	50.47143	0	672
Haicotbean total consumption	289	70632.25	746443.5	0	1.18e+07
Haricotbean price	289	.0001384	.0011703	0	.01
expenditure_haricotbeanpurchase	289	6.020761	51.20278	0	470.4
expenditure_haricotbeanown	289	700.3017	7463.799	0	117600
expenditure_haricotbeangift	289	0	0	0	0
Haricotbean total _expenditure	289	706.3225	7464.435	0	117600
pulses _total consumption	289	90520.38	753151.1	0	1.18e+07
pulses _expenditure	289	1135.345	7774.7	0	117600
Total price of pulses (P2)	129	.0281109	.0150748	.00667	.06667
Eggtotal consumption	289	4301.522	29053.34	0	453600
eggprice	289	.0057163	.0172386	0	.08
expenditure_egg _purchase	289	76.03561	278.6703	0	2318.4
expenditure_egg _own	289	25.58194	360.6836	0	6063.807
expenditure_egg _gift	289	76.26162	1296.447	0	22039.61
Egg total _expenditure	289	177.8792	1367.139	0	22039.61
Milk total consumption	289	15617.35	138716.3	0	2318400
milkprice	289	.0029146	.0077352	0	.04

expenditure_milk_purchase	289	62.93142	216.8949	0	1656
expenditure_milk_own	289	239.6946	2840.804	0	47629.44
expenditure_milk_gift	289	6.551364	111.3732	0	1893.344
milktotal_expenditure	289	309.1774	2845.235	0	47629.44
Yoghurt total consumption	289	76.40138	1034.864	0	16800
yoghurtprice	289	.0001315	.00158	0	.02
expenditure_yoghurpurchase	289	1.491488	20.52147	0	336
expenditure_yoghurown	289	0	0	0	0
expenditure_yoghurgift	289	0	0	0	0
yoghurttotal_expenditure	289	2586.799	11291.66	0	146881.2
Butter total consumption	289	3009.225	13566.01	0	137760
butterprice	289	.0306286	.0656041	0	.25
expenditure_butterpurchase	289	385.662	2394.458	0	27552
expenditure_butterown	289	60.17744	575.9749	0	7561.426
expenditure_buttergift	289	78.49232	801.3889	0	9937.875
Butter total_expenditure	289	524.3318	2576.546	0	27552
Cottage cheese total consumption	289	3409.174	20838.06	0	268800
Cottage cheese price	289	.0060488	.0230694	0	.2
expenditure_cottagpurchase	289	63.56561	274.6704	0	2688
expenditure_cottagown	289	190.1739	1630.702	0	21358.61
expenditure_cottaggift	289	18.21236	223.6867	0	3203.791
Cottage cheese total_expenditure	289	271.9519	1658.654	0	21358.61
Beef total consumption	289	3653.999	10843.26	0	79200
beefprice	289	.0248431	.0626491	0	.5
expenditure_beef_purchae	289	463.8084	1377.263	0	9792
expenditure_beef_own	289	0	0	0	0
expenditure_beef_gift	289	70.51134	742.9136	0	9889.216
beeftotal_expenditure	289	534.3197	1609.078	0	12106.82
Mutton total consumption	289	755.9862	9317.503	0	154560
muttonprice	289	.0029511	.0226072	0	.2
expenditure_muttonpurchase	289	112.8873	1336.813	0	22080.44
expenditure_muttonown	289	0	0	0	0
expenditure_muttongift	289	0	0	0	0
muttotal_expenditure	289	112.8873	1336.813	0	22080.44
Chicken total consumption	289	44.60702	682.1539	0	11520
chickenprice	289	.0010381	.0124567	0	.15
expenditure_chickepurchase	289	6.691054	102.3231	0	1728
expenditure_chickeown	289	0	0	0	0
expenditure_chickegift	289	0	0	0	0
Chicken total_expenditure	289	6.691054	102.3231	0	1728
Goattotal consumption	289	0	0	0	0
goatmeatprice	289	0	0	0	0

expenditure_goatmeatpurchase	289	0	0	0	0
expenditure_goatmeatown	289	0	0	0	0
expenditure_goatmeatgift	289	0	0	0	0
Goatmeat total_expenditure	289	0	0	0	0
Fish total consumption	289	0	0	0	0
fishprice	289	0	0	0	0
expenditure_fish_purchase	289	0	0	0	0
expenditure_fish_own	289	0	0	0	0
expenditure_fish_gift	289	0	0	0	0
fishtotal_expenditure	289	0	0	0	0
Total consumption ofanimal products	289	30868.27	147314.6	0	2318400
Total expenditure of animal products	289	4524.037	12404.3	0	146881.2
Total price of animal products (p3)	108	.7910345	4.098791	.01	40.07338
Falsebanana total consumption	289	105389	909028.8	0	1.41e+07
Falsebanana total expenditure	289	.0028028	.0116915	0	.1
expenditure_falsebananapurchase	289	0	0	0	0
expenditure_falsebananaown	289	3881.629	37907.19	0	601617.1
expenditure_falsebananagift	289	550.5938	8337.191	0	141195.9
Falsebanana total_expenditure	289	4432.223	38757.9	0	601617.1
Potato total consumption	289	8884.878	22859.57	0	307200
potatoprice	289	.0038015	.0049711	0	.015
expenditure_potatopurchase	289	79.81124	217.5845	0	3072
expenditure_potatoown	289	.7362878	12.51689	0	212.7872
expenditure_potatogift	289	4.593796	63.25932	0	1036.181
Potato toal_expenditure	289	85.14133	225.2769	0	3072
Collardgreen total consumption	289	161911.1	294577.2	0	1764000
Collardgreen total price	289	.0067109	.0072826	0	.038
expenditure_collarpurchase	289	155.8332	232.461	0	1545.6
expenditure_collarown	289	1729.968	3620.862	0	21382.5
expenditure_collargift	289	54.70071	454.5249	0	5091.072
Collardgreen total expenditure	289	210.5339	493.6822	0	5091.072
Lettuce total consumption	289	752.1503	5912.329	0	84000
lettuceprice	289	.0004729	.0026109	0	.02
expenditure_lettucpurchase	289	8.709544	68.84238	0	840
expenditure_lettucown	289	0	0	0	0
expenditure_lettucgift	289	0	0	0	0
Lettuce total _expenditure	289	8.709544	68.84238	0	840
Ginger total consumption	289	998.8848	8149.262	0	117600
gingerprice	289	.0033218	.012249	0	.08

expenditure_gingerpurchase	289	28.32779	219.8009	0	3444
expenditure_gingerown	289	0	0	0	0
expenditure_gingergift	289	0	0	0	0
Ginger total_expenditure	289	28.32779	219.8009	0	3444
Cabbage total consumption	289	5311.817	13288.02	0	141120
cabbageprice	289	.0027474	.0059555	0	.05
expenditure_cabbagepurchase	289	51.01842	135.5851	0	1646.87
expenditure_cabbageown	289	0	0	0	0
expenditure_cabbagegift	289	3.35421	44.21362	0	704.2407
Cabbage total_expenditure	289	54.37263	142.8948	0	1646.87
Garlic total consumption	289	2881.115	18321.32	0	300000
garlicprice	289	.0049167	.0111245	0	.06
expenditure_garlicpurchase	289	37.09998	103.9067	0	877.7144
expenditure_garlicown	289	0	0	0	0
expenditure_garlicgift	289	2.20269	37.44574	0	636.5775
Garlic total_expenditure	289	39.30267	109.7032	0	877.7144
Stringbean total consumption	289	62.9481	941.5051	0	15840
stringbean~price	289	.000346	.0041522	0	.05
expenditure_stringpurchase	289	3.147405	47.07525	0	792
expenditure_stringown	289	0	0	0	0
expenditure_stringgift	289	0	0	0	0
Stringtet total expenditure	289	3.147405	47.07525	0	792
Fenugreek total consumption	289	1.82699	22.01478	0	288
Fenugreek total price	289	.000173	.0021175	0	.03
expenditure_fenugreekpurchase	289	0	0	0	0
expenditure_fenugreekown	289	0	0	0	0
expenditure_fenugreekgift	289	0	0	0	0
Fenugreek total_expenditure	289	0	0	0	0
Oniontotal consumption	289	15861.27	23038.06	0	168000
onionprice	289	.01028	.0071626	0	.02833
expenditure_onion_purchase	289	168.4238	252.1267	0	3360
expenditure_onion_own	289	5.477814	93.12283	0	1583.088
expenditure_onion_gift	289	16.2052	154.3471	0	2176.746
oniontotal_expenditure	289	190.1069	297.5825	0	3360
Pumpkin total consumption	289	2664.083	29286.47	0	483840
pumpkinprice	289	.0002336	.0016827	0	.025
expenditure_pumpkipurchase	289	4.883045	37.81948	0	504
expenditure_pumpkiown	289	12.17522	192.6358	0	3265.92
expenditure_pumpkigift	289	0	0	0	0
Pumpkin total_expenditure	289	17.05827	196.009	0	3265.92
Carrot total consumption	289	2663.644	10101.49	0	97920
carrotprice	289	.0015052	.0035699	0	.015

expenditure_carrotpurchase	289	17.62606	53.02753	0	355.2
expenditure_carrotown	289	6.422168	77.08106	0	946.5633
expenditure_carrotgift	289	.7224938	12.2824	0	208.8007
Carrot total_expenditure	289	24.77072	92.96352	0	946.5633
Tomato total consumption	289	2338.229	5969.453	0	40320
tomatoprice	289	.0028558	.006221	0	.02857
expenditure_tomatopurchase	289	30.29387	77.76827	0	532.8
expenditure_tomatoown	289	0	0	0	0
expenditure_tomatogift	289	3.289941	36.14378	0	576.2381
Tomato total_expenditure	289	33.58381	84.58283	0	576.2381
Bulla total consumption	289	3761.756	15221.26	0	180000
bullaprice	289	.0027033	.0079581	0	.05
expenditure_bulla_purchase	289	58.54798	236.5624	0	2112
expenditure_bulla_own	289	21.5083	268.0218	0	4261.356
expenditure_bulla_gift	289	9.18133	86.51834	0	1272.725
bullatotal_expenditure	289	89.2376	362.3264	0	4261.356
Sweetpotato total consumption	289	1121.985	3430.622	0	18720
Sweetpotato total price	289	.0016395	.0046023	0	.02857
expenditure_sweetpotatopurchase	289	14.99117	46.44117	0	287.9136
expenditure_sweetpotatoown	289	0	0	0	0
expenditure_sweetpotatogift	289	0	0	0	0
Sweetpotato total_expenditure	289	14.99117	46.44117	0	287.9136
Beetroot total consumption	289	1217.867	4666.828	0	43200
beetrootprice	289	.0011715	.0036891	0	.02857
expenditure_beetrootpurchase	289	13.77476	53.97686	0	441.6
expenditure_beetrootown	289	0	0	0	0
expenditure_beetrootgift	289	0	0	0	0
Beetroot total_expenditure	289	13.77476	53.97686	0	441.6
Banana total consumption	289	2655.541	6555.926	0	53280
bananaprice	289	.0040012	.0073902	0	.026
expenditure_bananapurchase	289	40.14713	112.4005	0	0
expenditure_bananaown	289	18.52187	161.162	0	1733.584
expenditure_bananagift	289	3.433387	39.1855	0	627.2838
Banana total_expenditure	289	62.1024	195.6927	0	1733.584
Orange total consumption	289	8717.738	61229.83	0	997920
orangeprice	289	.0030252	.0069673	0	.03
expenditure_orangepurchase	289	28.52198	118.355	0	1260
expenditure_orangeown	289	103.9296	984.1855	0	16156.72
expenditure_orangegift	289	11.00902	120.4227	0	2012.791
Orange totaal_expenditure	289	143.4606	994.1102	0	16156.72
Pineapple total consumption	289	240.8304	1577.403	0	13440
Pineappleprice	289	.0004429	.0030919	0	.026

expenditure_pineappurchase	289	4.339931	31.52603	0	336
expenditure_pineapown	289	0	0	0	0
expenditure_pineapgift	289	.8149468	13.8541	0	235.5196
Pineapple total_expenditure	289	.8149468	13.8541	0	235.5196
Lemon total consumption	289	1156.449	10439.3	0	161280
lemonprice	289	.003406	.0098	0	.04
expenditure_lemon_purchase	289	4.36579	18.41833	0	235.2
expenditure_lemon_own	289	23.22164	268.3681	0	4177.7
expenditure_lemon_gift	289	.4151714	5.858535	0	96.98233
Lemon total_expenditure	289	28.0026	268.642	0	4177.7
Strawberry total consumption	289	0	0	0	0
strawberryprice	289	0	0	0	0
expenditure_strawbarrypurchase	289	0	0	0	0
expenditure_strawbarrypown	289	0	0	0	0
expenditure_strawbarrypgift	289	0	0	0	0
strawberry_expenditure	289	0	0	0	0
Appletotal consumption	289	5.647059	96	0	1632
appleprice	289	.0001384	.0023529	0	.04
expenditure_apple_purchase	289	.2258823	3.84	0	65.28
expenditure_apple_own	289	0	0	0	0
expenditure_apple_gift	289	0	0	0	0
appletotal_expenditure	289	.2258823	3.84	0	65.28
Watertotal consumption	289	0	0	0	0
Watermelon price	289	0	0	0	0
expenditure_watermelonpurchase	289	0	0	0	0
expenditure_watermelonown	289	0	0	0	0
expenditure_watermelongift	289	0	0	0	0
Watermelon total_expenditure	289	0	0	0	0
Avocadototal consumption	289	10072.59	33773.19	0	0
avocadoprice	289	.0038081	.0069445	0	0
expenditure_avocadpurchase	289	36.9136	92.25966	0	806.4
expenditure_avocadown	289	79.81506	306.4784	0	2952.445
expenditure_avocadgift	289	33.44011	413.2311	0	6990.347
Avocadototal expenditure	289	150.1688	509.4261	0	6990.347
Mangototal consumption	289	2721.467	9064.227	0	124320
mangoprice	289	.0025011	.0056835	0	.03333
expenditure_mango_purchase	289	24.78732	67.58308	0	475.2
expenditure_mango_own	289	74.42327	300.7736	0	2397.174
expenditure_mango_gift	289	11.1935	104.585	0	1633.863

mangototal_expenditure	289	110.4041	316.2897	0	2397.174
Guavatotal consumption	289	604.6505	8292.935	0	138240
guavaprice	289	.0001592	.001468	0	.02
expenditure_guava_purchase	289	1.338685	16.90321	0	278.4
expenditure_guava_own	289	5.5009	93.51529	0	1589.76
expenditure_guava_gift	289	0	0	0	0
guavatotal_expenditure	289	6.839585	94.95288	0	1589.76
Papayatotal consumption	289	2747.128	39224.06	0	665280
papayaprice	289	.0001765	.0013202	0	0.15
expenditure_papayapurchase	289	2.622561	21.60951	0	241.92
expenditure_papayaown	289	19.87765	332.6636	0	5654.88
expenditure_papayagift	289	.6776471	6.673567	0	73.44
Papayatotal expenditure	289	23.17785	333.2286	0	5654.88
Vegetable total consumption	289	344744.7	978027.5	5376	1.45e+07
Vegetable total expenditure	289	5770.478	38742.17	0	602574.1
Total price of vegetable (p4)	289	.0121959	.0094778	0	.0795783
Blackseed total consumption	289	49.82699	847.0588	0	14400
Blackseed total price	289	.0000692	.0011765	0	.02
expenditure_blackseedpurchase	289	.9965398	16.94118	0	288
expenditure_blackseedown	289	0	0	0	0
expenditure_blackseedgift	289	0	0	0	0
Blaseed total_expenditure	289	.9965398	16.94118	0	288
Seasam total consumption	289	0	0	0	0
sesameprice	289	0	0	0	0
expenditure_seasampurchase	289	0	0	0	0
expenditure_seasamown	289	0	0	0	0
expenditure_seasamgift	289	0	0	0	0
Seasam total_expenditure	289	0	0	0	0
Safflower total consumption	289	0	0	0	0
Safflower total price	289	0	0	0	0
expenditure_safflowerpurchase	289	0	0	0	0
expenditure_safflowerown	289	0	0	0	0
expenditure_safflowergift	289	0	0	0	0
Safflower total_expenditure	289	0	0	0	0
Sunflower total consumption	289	0	0	0	0
sunflowerprice	289	0	0	0	0

expenditure_sunflowerpurchase	289	0	0	0	0
expenditure_sunflowerown	289	0	0	0	0
expenditure_sunflowergift	289	0	0	0	0
Sunflower total_expenditure	289	0	0	0	0
Rapeseed total consumption	289	4.650519	79.05882	0	1344
Rapeseed price	289	.0001384	.0023529	0	.04
expenditure_rapeseedpurchase	289	.1860208	3.162353	0	53.76
expenditure_rapeseedown	289	0	0	0	0
expenditure_rapeseedgift	289	0	0	0	0
Rapeseed total_expenditure	289	.1860208	3.162353	0	53.76
Linseed total consumption	289	0	0	0	0
linseedprice	289	0	0	0	0
expenditure_linseedpurchase	289	0	0	0	0
expenditure_linseedown	289	0	0	0	0
expenditure_linseedgift	289	0	0	0	0
Linseed total _expenditure	289	0	0	0	0
Peanut total consumption	289	0	0	0	0
peanutprice	289	0	0	0	0
expenditure_peanutpurchase	289	0	0	0	0
expenditure_peanutown	289	0	0	0	0
expenditure_peanutgift	289	0	0	0	0
Peanut total_expenditure	289	0	0	0	0
Sugartotal consumption	289	6980.572	39799.61	0	00
sugarprice	289	.0088841	.0143366	0	
expenditure_sugar_purchase	289	148.8223	800.1867	0	
expenditure_sugar_own	289	0	0	0	
expenditure_sugar_gift	289	5.42736	92.26512	0	.507
sugartotal_expenditure	289	154.2497	804.4816	0	9408
Salttotal consumption	289	10285.38	18782.95	0	60
saltprice	289	.011309	.0064353	0	
expenditure_salt_purchase	289	101.7462	198.0852	0	.72
expenditure_salt_own	289	0	0	0	
expenditure_salt_gift	289	23.64902	151.9553	0	.983
Salttotal _expenditure	289	125.3952	239.7896	0	.72
Cookingoil total consumption	289	20445.03	55292.14	0	00
Cookingoil total price	289	.0356597	.0205711	0	

expenditure_cookingoilpurchase	289	652.8179	1647.646	0	8.4
expenditure_cookingoilown	289	0	0	0	
expenditure_cookingoilgift	289	62.05628	443.4306	0	.544
Cookingoil total expenditure	289	714.8742	1693.864	0	12398.4
Pimentototal consumption	289	3190.491	34096.97	0	576000
pimentoprice	289	.003096	.0081723	0	.05
expenditure_pimentopurchase	289	54.6446	678.9725	0	11520
expenditure_pimentoown	289	2.360204	40.12347	0	682.0991
expenditure_pimentogift	289	0	0	0	0
Pimento total expenditure	289	57.00481	679.9667	0	11520
Pepper total consumption	289	9717.74	45575.87	0	633600
pepperprice	289	.0423109	.0368747	0	.12
expenditure_pepperpurchase	289	614.9805	2954.342	0	38016
expenditure_pepperown	289	0	0	0	0
expenditure_peppergift	289	12.29532	209.0205	0	3553.348
Pepper total expenditure	289	627.2758	2959.164	0	38016
Honeytotal consumption	289	0	0	0	0
honeyprice	289	0	0	0	0
expenditure_honey_purchase	289	0	0	0	0
expenditure_honey_own	289	0	0	0	0
expenditure_honey_gift	289	0	0	0	0
honeytotal_expenditure	289	0	0	0	0
Others total consumption	289	50673.7	133977.4	0	1386000
Others total expenditure	289	1679.982	4885.88	0	54996.48
Total price of Others (p5)	278	.0315845	.0119742	.0024966	.0786
Grand total (sum of all food group expenditure)	289	44145.33	87978.51	963.6628	779266.9
Food group share (W)					
w1	289	.6119456	.3147282	0	.9948544
w2	289	.321345	.276677	0	.8767421
w3	289	.1306053	.193349	0	.7936435
w4	289	.1486292	.2152441	0	.9919339
w5	289	.0883031	.1357059	0	.8473591

Annex 4. Structural parameters, Marshallian Elasticity

Structural parameter of the Butajira HDSS, Marshallian elasticity

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Alpha						
alpha_1	.8091925	.3681749	2.20	0.028	.0875829	1.530802
alpha_2	-1.881516	.1681974	-11.19	0.000	-2.211177	-1.551855
alpha_3	.5267678	.1807715	2.91	0.004	.172462	.8810735
alpha_4	-1.5111	.2452828	-6.16	0.000	-1.991846	-1.030354
alpha_5	3.056656	.3662767	8.35	0.000	2.338767	3.774545
beta						
beta_1	-.2075383	.0538467	-3.85	0.000	-.3130759	-.1020006
beta_2	.2577921	.0223155	11.55	0.000	.2140545	.3015297
beta_3	.0485241	.0228234	2.13	0.033	.0037909	.0932572
beta_4	.2675263	.0306717	8.72	0.000	.2074109	.3276418
beta_5	-.3663043	.0485778	-7.54	0.000	-.4615149	-.2710936
gamma						
gamma_1_1	-.7618869	.1829622	-4.16	0.000	-1.120486	-.4032875
gamma_2_1	.4234102	.0994887	4.26	0.000	.2284159	.6184046
gamma_3_1	.2836388	.0552839	5.13	0.000	.1752842	.3919933
gamma_4_1	.3856172	.1150684	3.35	0.001	.1600872	.6111472
gamma_5_1	.3307793	.0837582	-3.95	0.000	-.4949423	-.1666163
gamma_2_2	.4253451	.0686364	-6.20	0.000	-.55987	-.2908201
gamma_3_2	.0840751	.0343721	-2.45	0.014	-.1514432	-.0167069
gamma_4_2	.4036616	.0427371	-9.45	0.000	-.4874248	-.3198984
gamma_5_2	.4896715	.0820954	5.96	0.000	.3287674	.6505757
gamma_3_3	.0965914	.0296688	-3.26	0.001	-.1547411	-.0384416
gamma_4_3	.139686	.0383968	-3.64	0.000	-.2149423	-.0644296
gamma_5_3	.0367136	.0514299	0.71	0.475	-.064087	.1375143
gamma_4_4	.3655117	.0853501	-4.28	0.000	-.5327948	-.1982286
gamma_5_4	.5232421	.0801254	6.53	0.000	.3661993	.6802849
gamma_5_5	-.7188479	.1789323	-4.02	0.000	-1.069549	-.3681471
lambda						
lambda_1	.012871	.0024439	5.27	0.000	.0080811	.017661
lambda_2	-.0065396	.0008213	-7.96	0.000	-.0081493	-.00493
lambda_3	-.0057402	.0010666	-5.38	0.000	-.0078307	-.0036497
lambda_4	-.0092043	.0009551	-9.64	0.000	-.0110764	-.0073323
lambda_5	.0086131	.0014341	6.01	0.000	.0058023	.0114239
eta (own and cross price elasticity)						
Price elasticity adjusted for Household SIZE_1	.0021446	.0010037	2.14	0.033	.0001773	.0041119
Price elasticity adjusted for HouseholdSIZE_2	.0003944	.0003143	1.26	0.209	-.0002215	.0010104
Price elasticity adjusted for HouseholdSIZE_3	.0007856	.0007007	-1.12	0.262	-.002159	.0005878
Price elasticity adjusted for HouseholdSIZE_4	.0018045	.0007687	-2.35	0.019	-.0033112	-.0002979
Price elasticity adjusted for HouseholdSIZE_5	.0000511	.0008588	0.06	0.953	-.001632	.0017342

Price elasticity adjusted for AGE_1	-.0019704	.0004724	-4.17	0.000	-.0028963	-.0010444
Price elasticity adjusted for AGE_2	-.0007596	.0001434	-5.30	0.000	-.0010407	-.0004785
Price elasticity adjusted for AGE_3	.0011923	.0003169	3.76	0.000	.0005712	.0018133
Price elasticity adjusted for AGE_4	.0001603	.0003301	0.49	0.627	-.0004867	.0008073
Price elasticity adjusted for AGE_5	.0013774	.0004117	3.35	0.001	.0005704	.0021844
Price elasticity adjusted for quartilexpenditrend_1	.0027649	.0020104	1.38	0.169	-.0011753	.0067051
Price elasticity adjusted for quartilexpenditrend_2	-.0038446	.0006513	-5.90	0.000	-.0051212	-.002568
Price elasticity adjusted for quartilexpenditrend_3	-.0009364	.0012699	-0.74	0.461	-.0034253	.0015525
Price elasticity adjusted for quartilexpenditrend_4	-.0053766	.0015591	-3.45	0.001	-.0084324	-.0023208
Price elasticity adjusted for quartilexpenditrend_5	.0073927	.001784	4.14	0.000	.0038961	.0108893
rho (coefficient)						
Coefficient (rho)_HouseholdSIZE	.0058462	.0035745	1.64	0.102	-.0011597	.0128521
Coefficient (rho)_AGE	-.0278111	.0003238	-85.89	0.000	-.0284458	-.0271765
Coefficient (rho)_wealthquartilexpenditrend	.0054795	.0023829	2.30	0.021	.0008092	.0101498

Structural parameter for Urban kebele of Butajira HDSS

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
alpha						
alpha_1	-3.210857	.6945055	-4.62	0.000	-4.572063	-1.849651
alpha_2	-.1255147	.1859152	-0.68	0.500	-.4899018	.2388725
alpha_3	2.461856	.4200321	5.86	0.000	1.638608	3.285104
alpha_4	.711573	.2830097	2.51	0.012	.1568841	1.266262
alpha_5	1.162942	.6800251	1.71	0.087	-.1698822	2.495767
beta						
beta_1	.3482121	.1158335	3.01	0.003	.1211825	.5752416
beta_2	.0278504	.0291048	0.96	0.339	-.0291941	.0848948
beta_3	-.2737045	.0455872	-6.00	0.000	-.3630538	-.1843552
beta_4	.0017135	.0459757	0.04	0.970	-.0883972	.0918242
beta_5	-.1040714	.1147692	-0.91	0.365	-.3290149	.1208721
gamma						
gamma_1_1	-.8859343	.2485294	-3.56	0.000	-1.373043	-.3988256
gamma_2_1	.0172442	.0457435	0.38	0.706	-.0724114	.1068998

gamma_3_1	.5489334	.0937243	5.86	0.000	.3652372	.7326295
gamma_4_1	.1163972	.0671943	1.73	0.083	-.0153012	.2480956
gamma_5_1	.2033596	.1789788	1.14	0.256	-.1474324	.5541516
gamma_2_2	-.037458	.0158613	-2.36	0.018	-.0685455	-.0063705
gamma_3_2	.0182695	.0284488	0.64	0.521	-.0374892	.0740282
gamma_4_2	.0136971	.0143214	0.96	0.339	-.0143723	.0417665
gamma_5_2	-.0117527	.0225689	-0.52	0.603	-.0559869	.0324814
gamma_3_3	-.2893622	.0719796	-4.02	0.000	-.4304395	-.1482848
gamma_4_3	-.09606	.0389891	-2.46	0.014	-.1724772	-.0196429
gamma_5_3	-.1817807	.1006755	-1.81	0.071	-.379101	.0155397
gamma_4_4	.0858559	.0279039	3.08	0.002	.0311653	.1405466
gamma_5_4	-.1198902	.0370035	-3.24	0.001	-.1924157	-.0473647
gamma_5_5	.110064	.1016806	1.08	0.279	-.0892263	.3093543
lambda						
lambda_1	-.0014716	.0063625	-0.23	0.817	-.0139418	1.0109986
lambda_2	-.000225	.0014106	-0.16	0.873	-.0029898	.0025398
lambda_3	.0063622	.0040382	1.58	0.115	-.0015526	.014277
lambda_4	-.0035854	.0019519	-1.84	0.066	-.0074112	.0002403
lambda_5	-.0010801	.0059557	-0.18	0.856	-.0127531	.0105928
Eta (own and cross price elasticity)						
Price elasticity _wealthquartileexpenditureend_1	-.0085686	.0058702	-1.46	0.144	-.0200741	.0029368
Price elasticity _wealthquartileexpenditureend_2	-.0014288	.0010821	-1.32	0.187	-.0035497	.000692
Price elasticity _wealthquartileexpenditureend_3	-.0007497	.0057253	-0.13	0.896	-.011971	.0104716
Price elasticity _wealthquartileexpenditureend_4	-.0006291	.0022769	-0.28	0.782	-.0050918	.0038335
Price elasticity _wealthquartileexpenditureend_5	.0113763	.0050337	2.26	0.024	.0015104	.0212421
Rho (coefficient)						
Coefficient (Rho)_wealthquartileexpenditureend	3.084825	8.07492	0.38	0.702	-12.74173	18.91138

Structural parameter for Rural kebeles of Butajira HDSS

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
alpha						
alpha_1	-.1143469	.1274191	-0.90	0.370	-.3640837	.1353899
alpha_2	.1190755	.0549626	2.17	0.030	.0113509	.2268001

alpha_3	.4424137	.0954607	4.63	0.000	.2553142	.6295132
alpha_4	.3321154	.0982175	3.38	0.001	.1396125	.5246182
alpha_5	.2207423	.0267371	8.26	0.000	.1683385	.273146
beta						
beta_1	.0162246	.1291376	0.13	0.900	-.2368804	.2693297
beta_2	-.0106416	.0609474	-0.17	0.861	-.1300963	.1088131
beta_3	.035089	.0949848	0.37	0.712	-.1510778	.2212559
beta_4	-.0014704	.1162352	-0.01	0.990	-.2292873	.2263464
beta_5	-.0392016	.0275601	-1.42	0.155	-.0932184	.0148151
gamma						
gamma_1_1	-.2933415	.0681307	-4.31	0.000	-.4268753	-.1598078
gamma_2_1	.0933791	.0281965	3.31	0.001	.0381149	.1486433
gamma_3_1	.110593	.0323379	3.42	0.001	.0472119	.173974
gamma_4_1	.0118169	.040035	0.30	0.768	-.0666504	.0902841
gamma_5_1	.0775526	.0195424	3.97	0.000	.0392503	.115855
gamma_2_2	-.078391	.0232372	-3.37	0.001	-.1239352	-.0328469
gamma_3_2	-.0045276	.0146054	-0.31	0.757	-.0331537	.0240984
gamma_4_2	-.0079787	.0140312	-0.57	0.570	-.0354793	.0195219
gamma_5_2	-.0024818	.0105388	-0.24	0.814	-.0231375	.018174
gamma_3_3	-.036732	.0261897	-1.40	0.161	-.0880628	.0145988
gamma_4_3	-.0399486	.0212481	-1.88	0.060	-.0815941	.0016969
gamma_5_3	-.0293848	.007288	-4.03	0.000	-.0436689	-.0151006
gamma_4_4	.0430355	.0313791	1.37	0.170	-.0184664	.1045374
gamma_5_4	-.0069251	.0067627	-1.02	0.306	-.0201797	.0063295
gamma_5_5	-.038761	.0200344	-1.93	0.053	-.0780277	.0005058
lambda						
lambda_1	.0605618	.0239671	2.53	0.012	.0135872	.1075365
lambda_2	-.0029745	.0101254	-0.29	0.769	-.02282	.0168709
lambda_3	-.0248594	.0175341	-1.42	0.156	-.0592256	.0095068
lambda_4	-.0301151	.0185445	-1.62	0.104	-.0664617	.0062314
lambda_5	-.0026128	.0047027	-0.56	0.578	-.0118299	.0066043
Eta (own and cross price elasticity)						
Price elasticity adjusted for _HouseholdSIZE_1	.0258718	.0082185	3.15	0.002	.0097638	.0419798
Price elasticity adjusted for _HHSIZE_2	.0028503	.0037587	0.76	0.448	-.0045167	.0102173
Price elasticity adjusted for _HHSIZE_3	-.0102457	.0056396	-1.82	0.069	-.0212991	.0008077
Price elasticity adjusted for _HHSIZE_4	-.0145542	.0078591	-1.85	0.064	-.0299578	.0008494
Price elasticity adjusted for _HHSIZE_5	-.0039222	.0016689	-2.35	0.019	-.0071931	-.0006514

Price elasticity adjusted for _AGE_1	-.004021	.0029719	-1.35	0.176	-.0098459	.0018038
Price elasticity adjusted for _AGE_2	.0008727	.0013689	0.64	0.524	-.0018103	.0035558
Price elasticity adjusted for _AGE_3	-.0002789	.002011	-0.14	0.890	-.0042205	.0036627
Price elasticity adjusted for _AGE_4	.0027536	.0028108	0.98	0.327	-.0027556	.0082627
Price elasticity adjusted for _AGE_5	.0006736	.0006147	1.10	0.273	-.0005313	.0018785
Price elasticity adjusted for _wealthquartileexpenditureend_1	-.0257669	.0284349	-0.91	0.365	-.0814983	.0299645
Price elasticity adjusted for _wealthquartileexpenditureend_2	-.0029212	.0136613	-0.21	0.831	-.0296969	.0238545
Price elasticity adjusted for _wealthquartileexpenditureend_3	.0111738	.0200535	0.56	0.577	-.0281303	.0504779
Price elasticity adjusted for _wealthquartileexpenditureend_4	.0108686	.026103	0.42	0.677	-.0402924	.0620296
Price elasticity adjusted for _wealthquartileexpenditureend_5	.0066457	.0065322	1.02	0.309	-.0061572	.0194486
Rho (coefficient)						
Coefficient (rho)_HouseholdSIZE	89.31556					
Coefficient (rho)_AGE	3106.258					
Coefficient (rho)_wealthquartileexpenditureend	-354.7997					