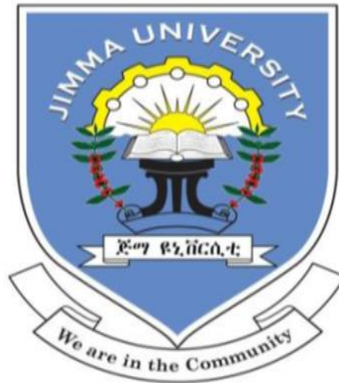


**SUPPLY AND DEMAND SIDE FACTORS INFLUENCING UTILIZATION  
OF INFANT AND YOUNG CHILD FEEDING IN GIBE DISTRICT,  
HADIYA ZONE, SOUTH ETHIOPIA, 2017.**



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## Abstract

**Background:**-.Although, infant and young child feeding practices play an important role in reducing early childhood morbidity and mortality, very large proportions of women do not practice optimal breastfeeding and complementary feeding for their children in Ethiopia. To date, there is not address the supply and demand side factors that influence infant and young child feeding practices. Additionally, no study is level the degree of influence on infant and young child feeding practices in the study area.

**Objective:** To assess supply and demand side factors that influence infant and young child feeding.

**Methods:** A community based cross-sectional study design with qualitative was conducted on randomly 434mothers who had children under age of 24 months from March 13 to April 13, 2017.Pre-tested structured questionnaire was used to interview the sampled mothers. Qualitative data was collected through in-depth interviews and focus group discussion. Qualitative data were analyzed through a thematic analysis approach. Quantitative data were coded and entered into Epi-data version 3.1. Then, it was exported to SPSS version 21.0 for analysis. Simple and multiple logistic regression analysis were applied to identify the associated factors of infant and young child feeding.

**Results:** *The overall, prevalence of inappropriate infant and young child feeding practice was 284 (67.9%). Being government employee of husband[AOR = 4.08 (1.65, 10.04)], lower income status [AOR = 3.11(1.36, 7.07)], not attending ANC (AOR = 2.03 (1.22, 3.36)], child age 0 - 5 months [AOR = 2.42(1.02, 5.72)], negative attitude of mothers towards IYCF [AOR = 2.35 (1.44, 3.84)] and number of children 3-4 [AOR = 1.99 (1.08, 3.64)] were independent predictors of inappropriate infant and young child feeding status.*

**Conclusion:** *There is high prevalence of inappropriate infant and young child feeding practice in the study area. Interventional initiatives should focus on improving socio-economic status, and access to information, education and communication (IEC); also increasing ANC coverage for further improvement of IYCF is recommended.*

**Keywords:** Infant and Young Child Feeding Practice, Supply side factors, Demand side factors, Ethiopia,

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## **Acronyms and Abbreviations**

**ANC-** Antenatal Care

**BF-** Breastfeeding

**EBF-** Exclusive Breastfeeding

**EPI-** Expanded Program of Immunization

**FMOH-** Federal Ministry of Health

**HEW-** Health Extension Worker

**HH-** Household

**HC-** Health center

**IF-** Infant Formula

**IYCF-** infant and young child feeding

**IYCFP-** infant and young child feeding practice

**IQ-** intelligence quotient

**MCH-** Maternal and Child Health

**MDD-** minimum dietary diversity

**MMF -** minimum meal frequency

**NGO-** Non-Governmental Organizations

**OPD-** Outpatient Department

**PNC-** Postnatal Care

**PBF-** predominant Breastfeeding

**SC-** caesarean section

**SPSS-** Statistical Package for Social Science

**SNNPR-** Southern Nations, Nationalities and people's

**TBA-** Traditional Birth Attendant

**TIBF-** Timely Initiation of Breastfeeding

**UNICEF-** United Nations Children's Fund

**USAID-** United States Agency for International Development

**WHO-** World Health Organization

# **1. Introduction:**

## **1.1. Background**

Infant and young child feeding is, as exclusive breast-feeding in children age less than 6 months, early initiation of breast-feeding, non- use of bottle feeding, minimum meal frequency, minimum dietary diversity, timely introduction of solid, semi-solid and soft foods in 6 - 8 months and breast feeding. Indicators for IYCF that are utilized in this study on the basis of literature review on WHO IYCF indicators include; initiating breastfeeding (BF) within one hour of delivery, exclusive breastfeeding (EBF) for the first six months, introduction of solid, semi-solid and soft foods in 6-8 months of age, minimum dietary diversity, minimum meal frequency and continued breastfeeding for 2 years(1).

Infant and young child feeding is a cornerstone of care for childhood development. The first two years of life provides a critical window of opportunity for ensuring children's appropriate growth and development of children from generation to generation through optimal feeding. Any damage caused during this period can lead to impaired cognitive development, compromised educational achievement, low economic productivity and malnutrition because the first two years of a child's life is the most important for establishing healthy growth. Once growth faltering occurs in this age, there is little opportunity for catch-up growth. Stunted infants grow to be stunted children and stunted adults (1-3).

WHO and UNICEF's recommendations for optimal IYCF are early initiation of breastfeeding within one hour of birth, exclusive breastfeeding for six months and nutritionally adequate and safe complementary feeding starting from the age of six months with continued breastfeeding up to two years of age or beyond. The WHO also has developed indicators (eight core and nine optional) to assess infant and young child feeding practices (1, 3, 4).

Composite variables of infant and young child feeding index based on key indicators identified by WHO are not studied in Ethiopia; there is no studies address the supply and demand side factors that influence the infant and young child feeding practices and associated factors in the study area.

## **1.2 Statement of Problem**

Globally, IYCF related problems in 2015, 156 million children under 5 were estimated to be stunted (too short for age), 50 million were estimated to be wasted (too thin for height), and 42 million were overweight or obese. About 43% of infants 0–6 months old are exclusively breastfed. Few children receive nutritionally adequate and safe complementary foods; in many countries less than a fourth of infants 6–23 months of age meet the criteria of dietary diversity and feeding frequency that are appropriate for their age(5, 6).

Over 800 000 children's lives could be saved every year among children under 5 years, if all children 0–23 months were optimally breastfed. Breastfeeding improves intelligence quotient (IQ), school attendance, and is associated with higher income in adult life. Improving child development and reducing health costs through breastfeeding results in economic gains for individual families as well as at the national level (6, 7).

Malnutrition has been responsible, directly or indirectly, for 60% of the 10.9 million deaths annually among children under five. Well over two-thirds of these deaths, which are often associated with inappropriate feeding practices, occur during the first year of life. No more than 35% of infants worldwide are exclusively breastfed during the first four months of life; complementary feeding frequently begins too early or too late, and foods are often nutritionally inadequate and unsafe. Malnourished children who survive are more frequently sick and suffer the life-long consequences of impaired development. Rising incidences of overweight and obesity in children are also a serious concern. Because poor feeding practices are a major threat to social and economic development, they are among the most serious obstacles to attaining and maintaining health that face this age group(6, 8).

Despite reduction of under nutrition being one to achieve SDGs goal, it continues to be a great public health concern in many developing countries, particularly in sub Saharan Africa(9, 10).

Millions of children globally suffer from under nutrition despite many declarations and action plans aimed at combating the phenomenon. The major indicators of under nutrition in developing

countries include stunting, wasting, and micronutrient deficiency. In developing countries total of 165 million, 101 million and 51 million children under the age of five are estimated to be stunted, underweight and wasted, respectively. What is more worrying is the high level of malnutrition in SSA, where approximately 40% of all children aged less than five years (56 million) are estimated to be stunted. Under nutrition is a serious risk factor for illness, and contributes substantially to be the burden of disease in developing countries. Over 1/3 of under-five mortality is caused by malnutrition related to inadequate complementary feeding (10, 11).

Rapid social and economic change only intensifies the difficulties that families face in properly feeding and caring for their children. As instance, expansion of urbanization results in more families to be dependent on informal or unsustainable employment with inadequate income and uncertain maternal benefits. With expanding urbanization both self-employed and nominally employed women face heavy workloads, usually with no maternity protection (4, 10).

In general, Poor complementary feeding practices means that many children continue to be vulnerable to irreversible outcomes of stunting, poor cognitive development, and significantly increased risk of infectious diseases leading to gastroenteritis, diarrhea and acute respiratory infection [9]. Nationally, 10 percent of Ethiopian children are wasted, and 3 percent are severely wasted and 44 percent of children under age five are stunted, and 21 percent of children are severely stunted (12, 13).

According to Ethiopian Demographic Health survey (EDHS) 2011, early initiation of complementary feeding in Ethiopia at the 6th month was only 51% while it was 10% in Nairobi, 50% in Taiwan and 55.1% in West Bengal India. The estimated infant mortality for Ethiopia have been decreased from 97 deaths per 1,000 live births(2000), to 77 deaths per 1,000 live births(2005), from 77deaths per1,000, to 59 deaths per live births(2011) and from 59 to 48 deaths per 1,000 live births (EDHS 2016)(12, 14).

From EDHS 2016, more than half (58 percent) of children less than 6 months old are exclusively breastfed but Complementary foods are not introduced on timely fashion for all children. At 6-9 months only about half of children receive complementary foods. Overall, only 4 percent of

children age 6-23 months is fed appropriately, based on the recommended infant and young child feeding (IYCF) practices. It is also documented that poor infant feeding practice which is poor breastfeeding and poor complementary feeding contribute to 24% of infant deaths (12, 15). Regardless of the policy and strategies adopted by Ethiopian Ministry of Health, the change seen in the prevalence and quality practice of the timely initiation of complementary feeding from 2005 to 2016 was insignificant.

These efforts were not based on organized evidence on the level of existing practices, which might be due to lack of studies which explored supply-demand side factors associated with IYCF practices. This study was done in Gibe district where little or no emphasis and studies are done regarding supply-demand side factors associated IYCF practices; therefore the study will provide clear findings regarding the magnitude of IYCF practices in Gibe district among infants less than 24 months of age. In addition to identifying the prevalence of IYCFP of children 0-24 months age, this study will fill the gap of the IYCF practice, which influence the under two years old child and can help to show direction to solve problems.

## **2. LITERATURE REVIEW**

### **2.1 Prevalence of IYCF indicators**

Globally Approximately 50% of all childhood mortality were related to malnutrition, but also that the first 2 years of life represents a critical window of vulnerability. The burden of under nutrition is still a major public health problem in the world. Almost 90% of the world's stunted children live in 36 developing countries. The potential negative impact of child under nutrition goes beyond the individual, affecting society and future generations (16). Approximately more than 80% continued breast feeding into the child's second and third year in which it can significantly improves child survival and enhancing quality of life. More than 50% of infants aged 6-9 months had delayed introduction of complementary foods. Only about 39% of infants in the developing countries, 25% in Africa are exclusively breastfed for the first six months (17).

A cross sectional study done in china showed that 62.4% of mothers were introduced formula food, and 21.2% of them introduce cow milk from 6-12 months of age. However, 76% of mothers were introduced complementary food to their infant between 4 and 6 months of age. Timely complementary feeding was 41.6% (18).

A study done in India found that nearly 48% of women were initiated complementary feeding during 6-9th month. More than one fourth of mothers give complementary food in 4-6th month. However, almost one in every ten mothers had initiated complementary food too late (12th month). Another study done in India found that more than 3/4 of mothers had started complementary feeding at 6 month. However, 12% children had delayed complementary feeding (19).

A study in Dakaha, Bangladesh showed of the non-EBF mothers, 16% started complementary feeding after the recommended time and 84% started complementary feeding before six months of age of the child. About 52% EBF mothers did not give homemade foods whereas 42 non-EBF mothers had the same practice. At 6-8 months of age, 60% EBF mothers gave the main meal to their children thrice a day (20).

In study in coastal south India 77.5% mothers had started complementary feeding at the recommended time of six months. Only 32% of mothers were giving an adequate quantity of complementary feeds (21).

A cross sectional study in Yemen shows that the prevalence of exclusive breastfeeding (< 6 months) to be 96%, 64% in Ghana (22), 40% in Dhamar City (Yemen) (23), 16.9% in Dhula Health Center (Yemen) (24), 20% in Nigeria(25), 8% in Saudi Arabia(26), while 2% in Riyadh (Saudi Arabia), 58% in EDHS 2016.

About 43% of infants < 6 months were feed using a bottle with a nipple, it is similar to the 2013 YNHDS(27), but much higher than that in Dhamar City (25%)(23). In Ethiopia 16% (EDHS 2011).

As recommended by WHO, children should receive at least 4 or more food groups from 7 groups after 6th month with mothers' milk. A study in Yemen about 28% of children received at least 4 or more food groups from 7 groups after 6th month with mothers' milk, in Cambodia and Nepal (24%) (28), in India (15.2%) (29), in Ethiopia (Dangila) (12.6%) (30), in Bangladesh (41.9 %) (31) and Sri Lanka (71 %)(32). In Ethiopia minimum acceptable diet by age, in months 6-8 months 4%, 9-11 months 9%, 9-11 months 8%, 18-23 months 7%, total 6-23 months 7% from EDHS 2016.

The habit of giving other liquids to the baby after birth and before 6th month is very common. This means that children are being introduced to water, juice, milk or other types of food much earlier than the recommended 6-9 months. Adequate complementary food (solid, semi-solid and soft food) should be introduced at 6 to 9 months(33). Complementary feeding requires that the infant receives breast milk and solid or semi-solid food. About 85% of infants in the sample were introduced complementary feed at the age recommended by WHO (6-9 months), in Nigeria (80%) (23), in Dhamar City (Yemen) (57.4%) (21).

A study in Yemen shows that complementary foods are initiated too early, where 22.4% of infants were received complementary foods before the age of six month, in Kenya (56%)(8), in Giza (Egypt) (60%)(34), and in Riyadh (Saudi Arabia) (88.9%) (35).

The 2016 EDHS collected data on infant and young child feeding (IYCF) practices for all children born in the 2 years preceding the survey. In Ethiopia, 58 percent of infants under 6 months are exclusively breastfed. Contrary to recommendation by WHO those children under age 6 months should be exclusively breastfed, 17 percent of infants 0-5 months consume plain water, 5 percent, each, consume non-milk liquids or other milk, and 11 percent consume complementary foods in addition to breast milk. Five percent of infants under age 6 months are not breastfed at all. The percentage exclusively breastfed decreases sharply with age from 74 percent of infants age 0-1 month to 64 percent of those age 2-3 months and, further, to 36 percent of infants age 4-5 months. Nine percent of infants under 6 months use a bottle with a nipple, a practice that is discouraged because of the risk of illness to the child [EDHS 2016].

A community-based cross-sectional study in Northern Ethiopia indicated that Approximately 79.7% of mothers introduced complementary feeding at 6 months age of the children as per recommended. Only 2.1% mothers introduced complementary feeding early before 6 month, 15.9% mothers initiated late after 6 month. Only 17.8% mothers offered four or more food groups to their child meeting the minimum dietary diversity criteria on the day preceding the study, 40.0% mothers fed their children more than two times the day preceding the study(29).

A community-based cross-sectional study in Southern Ethiopia indicated that the practices of timely initiation of complementary feeding, MMF and MDD were 72.5, 67.3 and 18.8 % among mothers of 6–23 months aged children, respectively. The practice of appropriate complementary feeding was 9.5 %. Child’s age (12–17 and 18–23 months) (36).



## **2.2 Factors Associated With IYCF**

### **2.2.1 Demand side factors**

#### **A. Influence of socio-demographic Factors on IYCF**

A study done in china which shows prevalence of timely complementary feeding 41.6% indicated that maternal education, and employment were associated with early initiation of complementary feeding and IYCF(37).

A study conducted in 5 European countries which enrolled 1090 formula feed infants and 588 breast feed infants, 65% and 35%, respectively. Multiple regressions showed low maternal age, low education level and maternal smoking to predictors an early introduction of solids at 3 and 4 completed months(38).

A study conducted at Hiwot Fana hospital, Harar, showed that the main reason given by the mothers for early initiation of complementary feeding was lack of knowledge 17(47.2%)majority 152(76.0%) of the women feed their young child 3-8 times per day while 35(17.5%) of women feed less than 3 times per day. The study also showed that Illiterate women were less likely initiate complementary feeding timely than women who had 12+ educational level, mothers had history of antenatal care visit up to 3 times more likely initiate complementary feeding timely than their counter parts, Mothers who had given birth at health institution were 2.4 times more likely initiate complementary food timely than mothers who had gave birth at home(39).

#### **B. Mothers' level of Knowledge of IYCF recommendation**

A study in Dakaha, Bangladesh showed that about 17% of mothers had no knowledge about the starting age of children for complementary feeding. About 52% EBF mothers did not give homemade foods whereas 42 non-EBF mothers had the same practice. At 6-8 months of age, 60% EBF mothers gave the main meal to their children thrice a day(40).

#### **C. Socio-economic status and maternal health service utilization**

In study in coastal south India the association of timely initiation and complementary feeding with socio-economic status, birth order, place of delivery and maternal education was found to be statistically significant. However the practice of giving an adequate quantity of complementary feeds was significantly associated only with the place of delivery(34, 41).

## **2.2.2 Supply side factors**

### **A. Sources of information**

A study done in Nepal, Kathmandu About sources of information on complementary feeding, revealed that majority (68.7%) has got information from family member and friends followed by television (41%) and health care workers (32.3%). Regarding knowledge, 56.4% respondents had knowledge about essential duration of breastfeeding along with complementary feeding is 24 months and 72.3% respondents mentioned age of introduction of complementary feeding is 6 months(41).

A study done in Kamba District south west Ethiopia on complementary feeding practice of children less than 2 years revealed that the reasons of respondent who start early complementary feeding were perception of mother's towards breast milk is not sufficient to satisfy the Childs water demand, working outside home and lack of information about the real time of initiation of complementary feeding were the major reasons(42).

### **B. Popular culture**

In a retrospective study done in Nia's Island, Indonesia majority of mothers believed that an appropriate time for introducing complementary foods was between one and four months. A perceived decline in the production of breast milk was the main reason mentioned for early introduction of complementary foods. The opinions of senior female members of the family, especially the paternal grandmother, about the infant's well-being played an important role in the decision of 9.1 % mothers to introduce solid, semi-solid, or soft foods (43).

Mothers base their infant feeding decisions on an array of factors which includes cultural beliefs. Pre-lacteal feeding is a popular culture as reflected in various studies done in India, Ethiopia and Tanzania. Additionally early introduction of complementary feeding is common in many cultures and frequently, such feedings are viewed as a means of socializing the infant into the family's diet culture (44, 45).

## **C. Support for IYCF**

A study done in Ghana showed that mothers complementary feeding practice were influenced by family, friends and clinic based health workers in shaping current infant feeding practices. The age of mothers and their current feeding practices reveals an interesting trend. Meanwhile mothers with tertiary schooling were practicing formula feeding more than their counterparts. Mothers' employment status was strongly associated with complementary feeding (46, 47).

### **2.3 Significance of study**

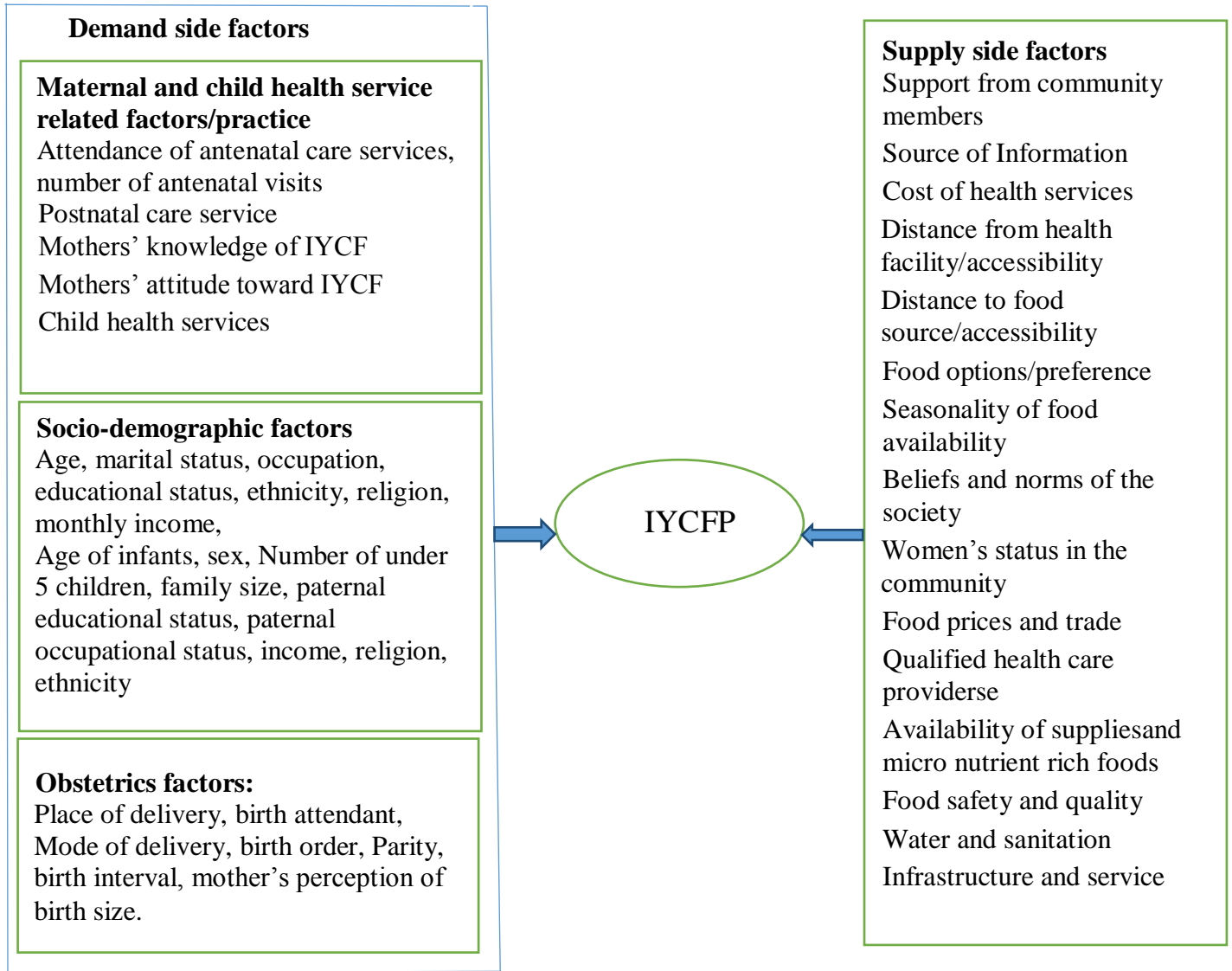
Appropriate infant and young child feeding practice are critical to child nutrition. Supply and demand side factors influencing utilization of infant and young child feeding in Ethiopia, especially in Hadiya zone, Gibe district, has not been well assessed. It is necessary and timely to study this important issue in the Gibe district. This study is therefore aimed to evaluate supply and demand side factors influencing utilization of infant and young child feeding among households who have children age 0-24 months in Gibe district, Hadiya zone, SNNPR, Ethiopia. The study will provide basic data on the issue, will be hoped to help local and national policy makers to implement and scale up safe motherhood program in an attempt to reduce the highest IYCF children age 0-24 month's morbidity and mortality rate in similar district in Ethiopia.

The result also will be useful in enabling the planners and program managers to design appropriate strategies, which address the supply and demand side factors influencing utilization of infant and young child feeding.

Further, this study will support the health care providers to introduce measures that could promote the supply and demand side factors influencing utilization of infant and young child feeding and support of their partners.

### **2.4 Conceptual framework**

The study will adapt Andersen behavioral model of health services utilization to identify supply and demand side factors influencing IYCF utilization among mothers who have child 0-24 months at Gibe district. As shown in figure 2 below, this behavioral model provides a systems perspective to identify, a range of supply side factors, demand side factors and socio-demographic factors associated with IYCFP.



**Figure 1.** Conceptual framework of supply and demand side of IYCF practices, adapted from the behavioral model of health services utilization developed by Andersen (48)

### **3. OBJECTIVE**

#### **3.1 General Objective**

To determine infant and young child feeding practices, supply and demand side factors that influence infant and young child feeding, Gibe district, Hadiya Zone, South Ethiopia, 2017.

#### **3.2 Specific Objectives**

1. To determine infant and young child feeding practices.
2. To identify demand side factors that influence infant and young child feeding.
3. To identify supply side factors that influence infant and young child feeding.

## 4. METHODS

### 4.1 Study area and period

The study was carried out in Gibe district, Hadiya Zone, SNNPR, Ethiopia, which is located at 264km from Addis Ababa (capital city of Ethiopia), 230km from Hawassa. The Gibe district is one of the highland areas in the country with an annual temperature estimated average minimum of 18°C and maximum of 38°C that can reach occasionally 45°C and an annual rainfall of 1400mm to 2000mm.

Gibe district has a total population and Households are 126,786 and 23,040 respectively. Among total population of district, 4186 are under two year children. There are 22 kebeles in district. There are 1 primary Hospital, 3 Health Centers and 22 Health Post in district. The data collection period was March 13 to April 13, 2017.

### 4.2 Study Design

A community based cross sectional study design with qualitative was employed.

### 4.3 Population

#### 4.3.1 Source population

All mothers with children under age of 24 months.

#### 4.3.2 Study population

Sampled mothers with children under age of 24 months.

#### 4.3.3 Inclusion Criteria

Mothers with children 0-24 months living in selected kebeles for more than 6 months.

#### 4.3.4 Exclusion criteria

Mothers who are unable to communicate.

### 4.4 Sample size and sampling techniques

#### 4.4.1 Sample Size Determination

The sample size was determined using single population proportion formula.

$$n = \frac{\left(Z_{\alpha/2}\right)^2 P(1-P)}{d^2} = \frac{(1.96)^2 0.22(0.78)}{0.05^2} = 263$$

In a study conducted in northern Ethiopia, only 22.2% of children achieved adequate/minimum dietary diversity(49).

With 95% confidence level, Marginal error of 5%.

$$n = \frac{(Z\alpha/2)^2 * P (1-P)}{D^2}$$

Where;

n= Sample size

Z $\alpha$ /2= Standard variant (1.96) which corresponds to 95% confidence level

P= Proportion minimum dietary diversity=22.2%

D= Acceptable margin of error (precision of measurement) = 5%

By adding 10% non-response rate and design effect of 1.5

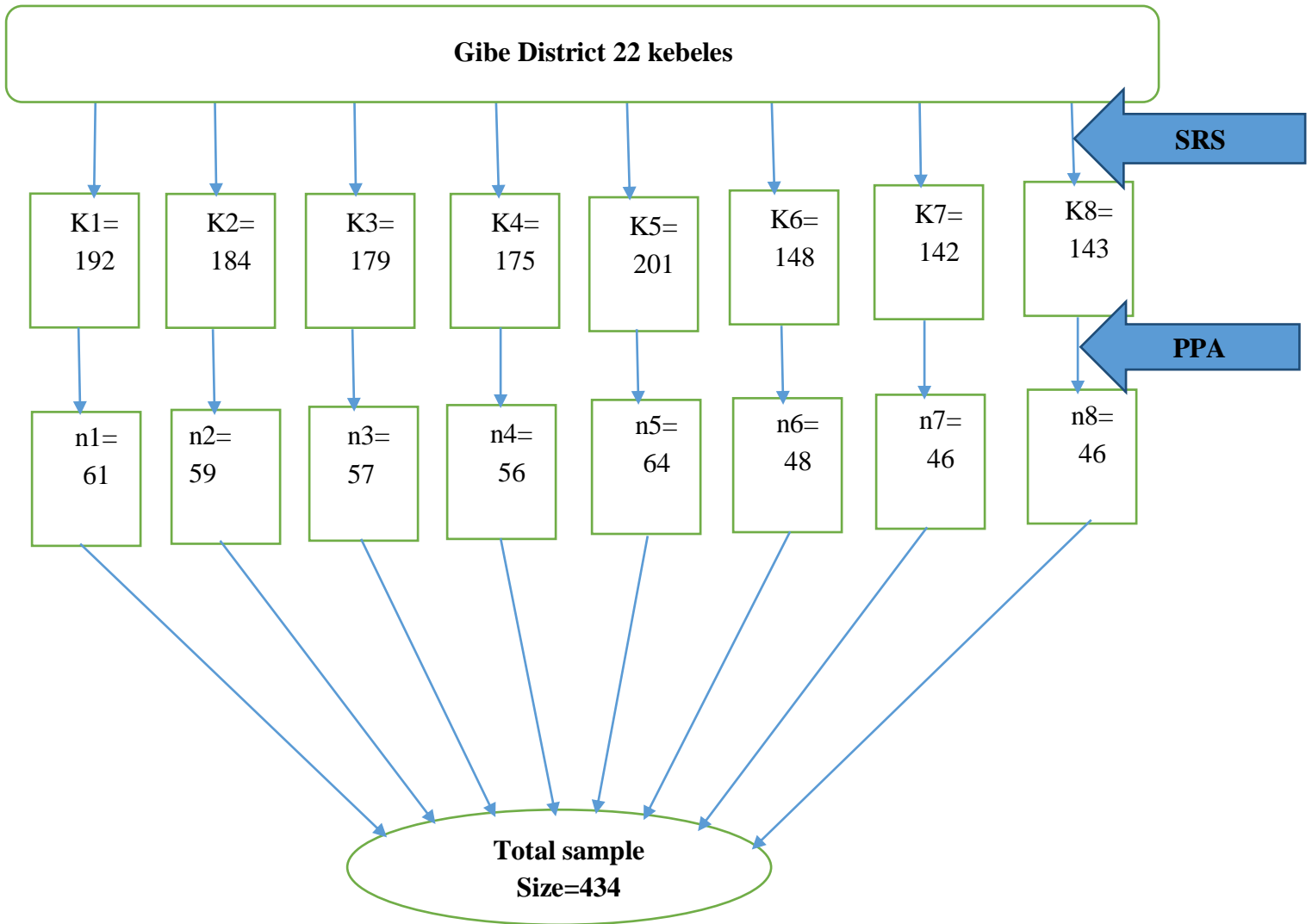
n = 263+ 10% = (263+ 26) x1.5= 434. Thus the final sample size was n=434

#### **4.4.2 Sampling-techniques**

There are 22 kebeles in Gibe district and eight of them were included in the study. First, the sample size was proportionally allocated to each kebele based on total number of mothers who have child 0-24 months. Study participants were selected by Systematic random sampling techniques. Lists of children under of age 24 months were prepared by Health Extension Works (HEWs) from family registration book and used as a sampling frame.

By rule of sampling proportionate to population size 434/1364= 0.32= 32% by the size of respective kebeles, to ensure proportionality. Where, 434; the calculated sample size and 1364; was total number of mothers with less than 24 months, in 2017. Therefore, by multiplying each of selected kebele number with 0.32 to get proportionality.

Sampling Procedure:-



Where; SRS- simple random sampling

PPA-proportion allocation

Figure 2. Schematic presentation of sampling procedure in kebeles in Gibe district, Hadiya Zone, SNNPR, 2017.



### **4.4.3 Sampling techniques of Qualitative Study**

Purposive sampling was used to select participants for the in-depth interview, FGD to reflect infant and young child feeding practices. Health workers working on child nutrition area, traditional birth attendants, religious leaders, breastfeeding mothers, grandmothers and HEWs were taken for in-depth interview in Gibe district. A minimum of 13 participants for In-depth interview, 21 participants in three FGD were included. Thirteen in-depth interviews were conducted with key informants, three with HEWs, one with MCH focal person midwifery nurse, two with traditional birth attendants (TBA), one with religious leader, three with breastfeeding mothers, and three with grandmothers. The aim of qualitative study was to support the findings of quantitative study with triangulation of the data. Totally three FGD's, two with 14 breastfeeding mothers and one with seven grandmothers.

### **4.5 Study variables and measurements**

#### **4.5.1 Dependent variable:-**

- ✚ Infant and young child feeding practice.

#### **4.5.2 Independent variables:-**

##### **Demand side factors**

- ❖ Mothers' knowledge and attitude towards IYCF.
- ❖ Maternal and child health status
- ❖ Number of under five children
- ❖ Child caregivers (parental and non-parental)
- ❖ Mothers health service utilization (ANC, PNC, Place of delivery )
- ❖ Type of delivery
- ❖ Mothers obstetrics (reproductive) history (number live birth, birth interval)
- ❖ (Age of the child, sex of the child, paternal educational status, paternal occupational status, paternal substance use, income, religion, ethnicity).

##### **Supply side**

Support from community members, distance from health facility, Source of Information, Water source

Support from community members, Cost of health services, Distance from health facility and food source, Food options/preference, Seasonality of food availability

Beliefs and norms of the society, Women's status in the community

Food prices and trade, Qualified health care providers, Availability of supplies and micro nutrient rich foods, Food safety and quality, Water and sanitation

#### **4.6. Measurements**

The outcomes of interest for this study infant and young child feeding practice. Infant and young child feeding practice refers as exclusive breast-feeding in children age less than 6 months, early initiation of breast-feeding, non- use of bottle feeding, minimum meal frequency, minimum dietary diversity, timely introduction of solid, semi-solid and soft foods in 6 - 8 months and breast feeding.

These variables were measured and defined as follows:

**Exclusive breast-feeding:** -infants, have received only breast-milk from his/her mother, and no other liquids or solids with the exception of drops or syrup consisting of vitamins, mineral or medicines. EBF measured for child less than 6 months only breast-fed within 24 hour and if child is greater than 6 month by asking mother whether child fed only breast milk up to six month. It was measured by binary variable 'yes' for those who practice mentioned and 'no' for not practice.

**Early initiation of breast feeding:** Putting neonate on mother breast to suck within 1 hour of delivery (including 1 hour). The variable was measured by binary variable 'yes' for those who suck within 1 hour and 'no' for not.

**Non- use of bottle feeding:** a mother who did not use a bottle for under two years. The variable was measured by binary variable 'yes' for those who did not use bottle and 'no' for those use.

**Minimum meal frequency:** children age 6 - 23 months who receive solid, semi-solid, or soft foods the minimum number (3 times for breastfed children and 4 times for non-breastfed children with 24 hours dietary recall. It was measured by binary variable 'yes' for those who practice mentioned and 'no' for not practice.

**Dietary diversity:** measured based on data collected on 7 foods groups within 24-hours dietary recall, which were grains, roots and tubers; legumes and nuts; dairy products (milk, yogurt, cheese); flesh foods (meat, fish, poultry and liver/organ meats); eggs; vitamin-A rich fruits and vegetables, and fruits and vegetables. It was measured by binary variable 'yes' for those who use four or more food mentioned and 'no' for less than four food groups.

**Timely introduction of solid, semi-solid and soft foods in 6 - 8 months and breast feeding:**

Introducing on timely within 6-8 months. It was measured by binary variable 'yes' for those who introduce and 'no' for not introduce.

Appropriate feeding practice for a specific age group received a score of 1, if summed score of the indicators above is equal to 4 or above.

For the assessment of breastfeeding practice currently used definitions and recommendations of WHO, the national strategy for IYCF was used. In this study mothers were requested to provide information regarding the time at which the baby has put to the breast and the 24-hour period feeding practice of the infant prior to the survey.

**To estimate the timely initiation of breastfeeding,** the ratio of infants put to the breast within 1 hour of delivery to the total number of infants was used.

**To estimate the prevalence of exclusive breastfeeding,** the proportion of women (with infants aged between 0 and 6 months) who stated to have fed their children only breast milk in the last 24-hours preceding the survey, was expressed as an exclusive breastfeeding percentage of the total number of children in the same age group. To assess the duration of breastfeeding continued breast feeding rate at one and two years was used.

**To estimate the continued breastfeeding rate at one year,** the proportion of children aged 12-15 months who breastfed in the last 24-hours preceding the survey, was expressed as continued breastfeeding percentage at one year of the total number of children in the same age group.

**To estimate the continued breastfeeding rate at two years,** the proportion of children aged 20-24 months who breastfed in the last 24-hours preceding the survey, was expressed as continued breastfeeding percentage at two year of the total number of children in the same age group.

**Age of the child:** measured from the date of birth to the date of the survey. For those with written evidence, date of birth was obtained from child health cards and for those who didn't have written documents, age was established relying on the date given by the mother. To prevent recall bias of birth date local calendar with common local events was used.

**Income:** if monthly income of the household is <500 lower, 501-1000 low, 1001-1500 medium, 1501-2000 high, and >2000 higher (18).

## **4.7. Data collection procedure**

### **Data collection instrument**

**Quantitative data:** The data was collected using a structured interviewer administered questionnaire which was developed by reviewing different literatures that are related to infant and young child-feeding practices and used to collect the data. The questionnaire has socio-demographic and socio-economic, child characteristics, breast-feeding practices, complementary feeding practices, maternal health service use characteristics, support and source of information for IYCF practices parts.

### **For Qualitative Study**

**For qualitative data:** the data was collected using FGD guide, in-depth interview guide. The participants for the in-depth interview with key informants who were selected purposively based on the assumption that they have more prior information on the issues

Interviews with HEWs, health professionals, TBA, religious leaders, breastfeeding mothers, and grandmothers were carried out independently. The key personnel such as, the OPD heads and the health center administrator, was involved in the in- depth interview. And also, for FGD who were not included in quantitative study.

The principal investigator was conducted the in-depth interview using a simple checklist of questions to be covered to collect the suggestions of the participants. The discussion with HEWs and health professionals, different key informants were carried out until it reached the saturation level. The points were manually written by both the principal investigator and one other note taker. For In-depth Interviews and FGD the questions were similarly translated into the local language, Hadiyisa like that of the standard and structured questionnaire.

### **Questionnaire has the following parts:**

**A.** Respondents' and parents' back ground: This part of the questionnaires were consist of respondents' background (age, sex, grade level) and parental background including education, residence, occupation and income using 16 items /questions.

**B.** Maternal health related factors: Respondents' were assessed using 8 items with yes/no and multiple-choice format. The items were summed up to produce index score; the higher score indicates more maternal health related factors.

**C.** Breast feeding and complementary feeding practices of infant and young children: Respondents' were assessed using 27 items with yes/no and multiple-choice format.

**D.** For Supply side factors: Respondents' were assessed using 13 items.

**E.** Knowledge of mothers: Respondents' were assessed using 9 items with yes/no and choices.

**F.** Maternal attitudes towards breastfeeding and complementary feeding practices: Respondents' were assessed using 25 Likert types of questions.

#### **4.8. Data collection methods**

Data were collected using questionnaires of two languages, on interview basis. The questioners were translated to local languages, Hadiyisa and Amharic, and back translated to English by language experts.

Respondents were asked by interviewer-administered questionnaire at home to home visit. Eight data collectors and two supervisors who were qualified with Diploma in nursing and BSc. in public health, was recruited and trained for both quantitative and qualitative. The data collectors and the supervisors were trained for two days on questions included in the questionnaire, approach to the interviewees, details of interviewing techniques, respect and maintaining privacy and confidentiality of the respondents. Objectives and importance of the study was briefed. Supervisors were supervised and coordinate their respective gotes/zone data collection activity. The investigator was identified study participants and coordinate all over activity.

#### **4.9. Data quality assurance**

Pre-test was conducted on mothers who have infant 0-24 months, at Soro Woreda before the study period and appropriate modification was applied. All filled questionnaires were checked for completeness, accuracy, and consistency. Necessary corrections and changes were made. All supervision was carried out by the Principal Investigator throughout the data collection period. This will help to identify problems that were addressed on the questionnaires.

#### **Tool development, translation, training to facilitator**

Data quality was ensured during instrument development (tool adapted from WHO guide line) collection, coding, entry and analysis. The questionnaire first was translated to Amharic/Hadiyisa language and retranslated back to English language before data collection and different translators were used to keep the consistency of the questionnaire. Then, supervisors and facilitators (since the questionnaire is interviewer-administered) were trained about the purpose of the study and how to supervise and collect interviewer - administered questionnaire respectively.

### **Pretest, checking completeness, coding, cleaning and entry**

The Instrument was tested on 5% of the respondents in Hadiya Zone, Gibe district which is not included in the study, before the actual data collection and correction was taken accordingly. During data collection, questionnaire was checked for its completeness on daily basis by facilitators, supervisors and then by investigator.

If there is a problem encounter during data collection, there was discussion with supervisors and facilitators accordingly. Incorrectly filled or missed questionnaire was discarded from analysis.

### **Trustworthiness**

Credibility was achieved by described the data collection. The interviews were carried out in places and at times chosen by the informants. The word ‘feelings’ is used instead of ‘emotions’ during the interview, because it is more common in everyday speech in Ethiopia. An atmosphere of trust between the informant and the data collector were sought. The lengths of the interviews were varied. Clarified questions were asked to test for misunderstanding. The researcher did the extreme to let the informant’s statements governed each step in addition to reflect and discussed the subject. The categories identified in this proposal were transferable to similar groups of participants and contexts. Dependability was censured by using a digital recorder, note taker, and then the interviews were transcribed to verify the results. The informants were asked similar questions in the same way, and the steps of analysis will be followed and described. Finally, Conformability was achieved by the use of systematic data collection

### **4.10. Data processing and analysis**

Data were checked manually for its completeness. The data were edited, coded and entered in to EPI data version 3.1 and exported to SPSS version 21.0 statistical software for analysis. Further, data cleaning (editing, recoding, checking for missing values, and outliers) were made after exported to SPSS. The data analysis ranges from the basic description to the identification of potential predictors of IYCFP.

Descriptive statistics were computed and presented using frequencies, proportions, summary statistics, graphs and tables. Variables that have P-value < 0.25 on bi-variate analyses were entered in the multivariate logistic regression model to identify independent predictors of IYCFP. All tests were two-sided and P < 0.05 was considered as statistically significant. The strength of association and precision were examined using adjusted odds ratio at 95% confidence interval.

All qualitative interviews were tape recorded and transcribed in full text. The transcribed materials were categorized, sub family and family were created and theme were developed by using ATLAS.ti version 7. Then comparison were done on the responses of different HEWs and health professionals to identify similarities and differences. Finally, information was linked to its congruence with data obtained from quantitative findings.

#### **4.11. Ethical consideration**

Ethical approval was obtained from Institutional Review Board (IRB) of institute of health, Jimma University. Formal supportive letter was obtained from Department of Health Education and Behavioral Sciences. The necessary permission was obtained from Hadiya Zone Health Department, SNNPR, Gibe district health office and finally from Health facilities. Verbal consent was obtained from the study participants (mothers) after explaining the purpose of the study. Participants were assured that their name will not be stated, data will be kept confidential and anonymous and it will be used only for research purpose. The participants were informed that this information was accessed by the investigator. They also informed that they were not forced to answer the entire question and they can withdraw at any time if they don't want to participate.

#### **4.12. Operational and Definitions of terms**

**Appropriate infant and young child feeding practice:**-defined as exclusive breast-feeding in children age less than 6 months, early initiation of breast-feeding, non- use of bottle feeding, minimum meal frequency, minimum dietary diversity, timely introduction of solid, semi-solid and soft foods in 6 - 8 months and breast feeding. A practice that was appropriate for a specific age group received a score of 1, and a practice that was inappropriate received a score of 0.If summed score of the indicators is equal to 4 or above, it was considered as appropriate IYCFP [2].

**Pre lacteal feeding:** -children gave something other than breast milk during the first three days of life.

**Exclusive breast-feeding:**-infants, have received only breast-milk from his/her mother, and no other liquids or solids with the exception of drops or syrup consisting of vitamins, mineral or medicines. EBF measured for child less than 6 months only breast-fed within 24 hour and if child is greater than 6 month by asking mother weather child fed only breast milk up to six month.

**Predominant breast-feeding:**-the infants' predominant nourishment has been breast-milk and allows the infant to receive certain liquids (water and water-based drinks, fruit juice), ritual fluids and ORS, drops or syrups (vitamins, minerals, medicines).Non-human milk and food-based fluids are not allowed.

**Continued breast-feeding at 2 year:** -children 20 - 23 months of age who are breast milk feed.

**Complementary foods:** -any solid or semi-solid or soft foods which are given to the child.

**Timely initiation of breast-feeding:** -Putting neonate on mother breast to suck within 1 hour of delivery

**Minimum Dietary Diversity:**-proportion of children with 6- 23 months of age who received foods from four or more food groups of the seven food groups [6, 14].

**Minimum meal frequency:** - children age 6-23 months who receive solid, semi-solid, or soft foods the minimum number twice for breastfeed infants 6-8 months, three times for breastfeed children 9-23 months, four times for non-breastfeed children 6-23 months (6, 14).

**Minimum acceptable diet:** -a composite indicator of minimum dietary diversity and Minimum meal frequency. When a currently breastfed and non- breast fed child meets both of minimum dietary diversity and Minimum meal frequency.



**Satisfactory Exposure to Media:**-Women aged 15–49 years at least once a week read a newspaper or magazine or listen to radio, or watched television (47).

**Sufficient knowledge of IYCF:** when the respondents correctly answer 60% or above 60% of questions about IYCF knowledge (47).

**Positive attitude about IYCF:** when the respondents agree and strongly agree to favorable questions to appropriate IYCF.

#### **4.13. Dissemination plan**

The findings of this study would be disseminated to faculty of public health and department of Health Education and Behavioral Sciences, to the SNNP Regional Health Bureau, Hadiya Zone Health Department, and Gibe district Health office. The findings would be also disseminated to different stakeholders/organizations that have a contribution to improve IYCF health services. Finally effort would be made to present in various seminars and workshops, for publication in national or international journals.

## **5. Results**

### **5.1. Socio-Demographic Characteristics**

A total 418 of mothers and caregivers of children less than 24 months were included in the study with response rate of 96.3%. The mean age of the mothers was 30.72 years ( $SD\pm 6.4$ ) and ranges from 19 to 47 years. More than half 228(54.5%) mothers were housewives, and 111(26.6%) farmers. Regarding mothers educational status, 170(40.7%) of mothers did not have formal education and 167(40.0%) primary education. Most of respondents were Hadiya by ethnicity (85.6%), Protestant by religion (70.6%). More than half 211 (50.5%) of households had a family size four to six and the median family size was six. Regarding wealth index one to five (20.6%) of respondents were in 3<sup>rd</sup> quartiles (Table 4). Regarding husband education level, 205(49.0%) and 101(24.2%) of them had primary education and secondary education respectively, whereas 245(58.6%) of husbands were farmers by occupation.

Table 1 Socio-demographic characteristics of respondents in Gibe District, Hadiya Zone, SNNPR, and Ethiopia from March 13 to April 13, 2017.

<b>Variables(n=418)</b>	<b>Categories</b>	<b>Number</b>	<b>Percent</b>
<b>Age (years)</b>	≤19	5	1.2
	20 - 29	197	47.1
	30-39	150	35.9
	≥40	66	15.8
<b>Marital status</b>	Married	403	96.4
	Widowed	9	2.2
	Divorced	6	1.4
<b>Educational status</b>	No education	170	40.7
	Primary education	167	40.0
	Secondary education	60	14.4
<b>Religion</b>	Higher education	21	5.0
	Protestant	295	70.6
	Orthodox	105	25.1
	Catholic	16	3.8
<b>Ethnicity</b>	Muslim	2	0.2
	Hadiya	358	85.6
	Gurage	31	7.4
	Amhera	16	3.8
<b>Occupational status</b>	Kambeta	13	3.1
	House wife	228	54.5
	Farmer	111	26.6
	Private	62	14.8
<b>Family size</b>	Government	17	4.1
	1 - 3	47	11.2
	4-6	211	50.5
<b>Income</b>	≥7	160	38.3
	Lower	83	19.9
	Low	81	19.4
	Medium	86	20.6
<b>Educational status of husband (n = 403)</b>	High	84	20.1
	Higher	84	20.1
	No education	38	9.1
	Primary education	205	49.0
	Secondary education	101	24.2
	Higher education	59	14.1

<b>Occupational status of husband</b> (n = 403)	Farmer	245	58.6
	Merchant	75	17.9
	Private	52	12.4
	Government	31	7.4

## 5.2 Child Characteristics

More than half 219(52.4%) of children were females and more than one-third 138 (33.0%) of them were 6-11 months old. More than two in five (65.8%) of children were second to fourth in birth order. About one-third of children (75.8%) birth intervals between youngest child (index child) and his immediate older were less than 24 months (Table 2).

Table 2 . Child characteristics in Gibe District, Hadiya Zone, SNNPR, Ethiopia from March 13 to April 13, 2017

<b>Variable (n = 418)</b>		<b>Number</b>	<b>Percent</b>
<b>Sex</b>	Male	199	47.6
	Female	219	52.4
<b>Age (completed months)</b>	0 - 5	90	21.5
	6 - 11	142	34.0
	12 - 17	125	29.9
	18 – 23	61	14.6
<b>Birth order</b>	First born	48	11.5
	2nd - 4th	275	65.8
	5 <sup>th</sup> or more	95	22.7
<b>Preceding birth interval (month)</b>	No previous birth	49	11.7
	Less than 24	317	75.8
	More or equal to 24	52	12.4
<b>Mother's perception of birth size</b>	Small	48	11.5
	Normal	269	64.3
	Large	78	18.7
	Don't know	23	5.5

### 5.3. Maternal Health Services Use Characteristics

A total of 265(63.4%) mothers attended antenatal care. Most of the mothers (35.5%) had antenatal care follow up at least once during their last pregnancy. Only 20.8% attended three-four focused ANC as recommended and during ANC follow up one-third (76.4%) of mothers didn't receive information about IYCFP. Majority, 396 (94.7%) of mothers had spontaneous vaginal delivery. With respect to delivery assist, only 144 (34.4%) mothers gave birth by the assistance of skilled health professionals, 270 (64.6%) gave birth at home and 35.4% of the mothers gave birth to their index child at a health institution. Most 296 (70.8%) of mothers didn't have PNC. Many of them (38.5%) had three-four children. Most 369 (88.3%) of mothers were multi-porous with mean of 4.2 live births and mean of total number of children they had was 3.96 (Table 3).

Table 3. Maternal Health service characteristics in Gibe district, Hadiya Zone, SNNPR, and Ethiopia from March 13 to April 13, 2017.

Variable name(n=418)		Number	Percent
ANC visit	Yes	265	63.4
	No	153	36.6
No. of times ANC visit	1-2 times	148	35.5
	3-4 times	87	20.8
	>4 times	11	2.6
	Don't know	19	4.5
Place of delivery	Home	270	64.6
	Health institution	148	35.4
Mode of delivery	Vaginally	395	94.7
	Caesarean section	22	5.3
Birth attendant	Skilled health professional	144	34.4
	TBA	161	38.5
	Relatives	109	26.1
	HEWs	4	1.0
PNC	Yes	122	29.2
	No	296	70.8
Number of children	1-2	103	24.6
	3-4	161	38.5
	≥ 5	154	36.8
Parity	Null-porous	49	11.7
	Multi-porous	369	88.3

### 5.4. Breast Feeding Practices

Almost all mothers 415 (99.3%) had ever breast-fed their children. Among mothers who are currently breast feed and 386 (92.3%) were also breast fed their children within 24 hour

preceding the survey. Among mothers who were not breast feeding their children currently, more than half (53.1%) reported that they stopped breast-feeding because it was time to stop (Table 4). Slightly less than half of the mothers 203 (48.6%) initiated breast-feeding within the 1st hour of delivery. A two third 273(65.3%) of the mothers gave colostrum's to their infants. Over all exclusive breast feeding for age groups (0-5 months) was 185(44.30%).The study also showed that 207 (49.5%) mothers provided pre lacteal foods for baby. More than half 331 (79.1%) of mothers didn't feed their children using bottle. Nearly 8.9% of the total bottles fed infants were put on the bottle at an age less than a month &12% of them between 3-4 months.

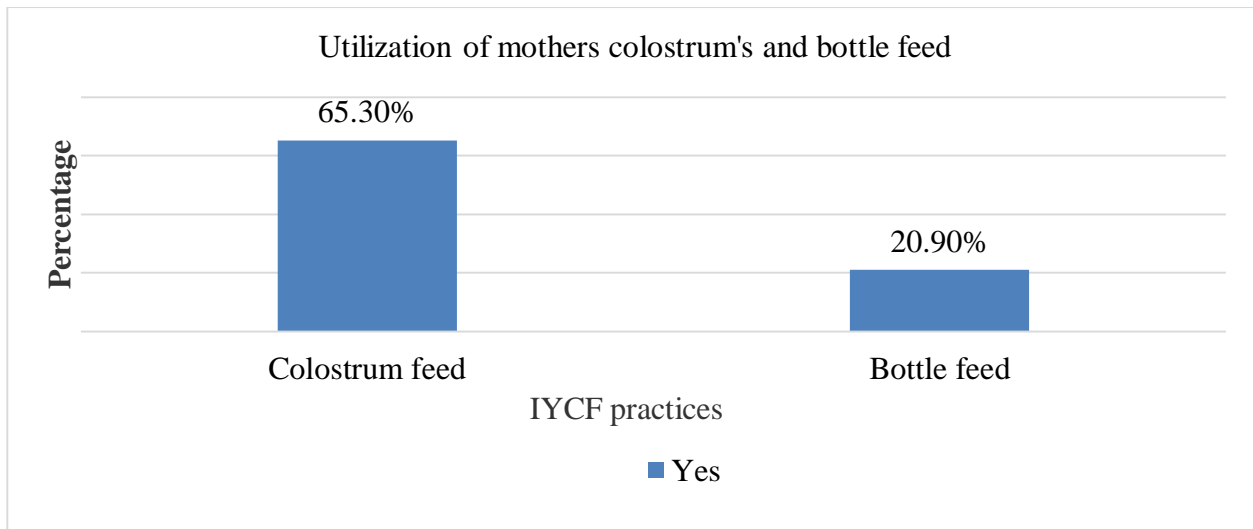


Figure 3. Mothers' utilization of Colostrum's and bottle feeding children's <2 years of age, Gibe district, Hadiya Zone, SNNPR, 2017.

*Most of them stated that "Every infant should be providing "Tenadam "before starting breastfeeding, because it protects the infant from the "evil eyes "of other people."*

*Almost all stated that "we provide "tenadam" with water for infants for two basic reasons: the "tenadam" cleans their mouth and stomach and we give water because of the breast milk has salty in its content, thus, the baby will be thirsty."*

Most mothers' breast-feed their child when child cries 332 (86.0%). The frequency of breast-feeding for those mothers who were currently breast feeding, 241(62.4%) of them reported that they were breastfeeding at least 8 times per day. The proportion of children aged 6 - 23 months who were predominantly breastfed was 183 (56.8%). Types of additional foods introduced before 6 month were, 125 (38.2%) of them introduced cow's milk and 10 (2.4%) fluid foods (Table 4).

Out of 125 mothers who had children age 12 - 17 months, almost all 118 (94.4%) of mothers continued to breastfeed their children until the end of first year. However, among 65 children age 18 - 23 months, 40 (61.5%) of them children continued to breast feed until the end of two years

Table 4 Breast feeding practices among mothers of under 24 months in Gibe District, Hadiya Zone, SNNPR, and Ethiopia from March 13 to April 13, 2017.

<b>Variables</b>		<b>Number</b>	<b>Percent</b>
<b>Children ever breast fed</b>	Yes	415	99.3
	No	3	0.7
<b>Breastfed their children within 24 hours</b>	Yes	386	92.3
	No	32	7.7
<b>Breast feeding frequency within 24 hour (n = 386)</b>	Less than 8 times	144	37.3
	At least 8 times	241	62.4
	Don't know	1	0.3
	Time to stop	17	53.1
<b>Reasons currently not breastfeeding (n = 32)</b>	Pregnancy	8	25.0
	Family planning	4	12.5
	Mother sick	2	6.2
	Small breast milk	1	3.1
	Abdominal pain	83	57.2
<b>Reason not fed colostrum's (n = 145)</b>	Dirty	38	26.4
	Others	24	16.7
	Butter	31	12.1
<b>Type of pre lactation fed</b>	Cow's milk	15	5.9
	Water	206	80.5
	Other	4	1.5
<b>Reason of bottle feeding</b>	Small breast milk	45	35.4
	Best benefit	40	31.5
	Failure to grow	6	4.7
	Others	36	28.4
<b>When do fed breast milk</b>	Child wants	163	42.3
	Child cries	331	85.7
	As schedule	47	12.2
	Breast engorged	189	48.9
	On convenience	41	10.7
	Others	6	1.6

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<b>Type of weaned foods before 6 months</b>	Cow's milk	125	38.2
	Fluid foods	10	2.4
	Water	5	1.5
	Formula milk	5	1.5
	Adult foods	3	0.9

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### **5.5. Complementary Feeding Practices**

Mothers practice of complementary feeding that was assessed in this study included: the practice of timely initiation of liquids, semi-solids and soft foods, dietary diversity, minimum meal frequency and use of bottle with teat to feed children semi-solids and liquids. The mean age for introduction of solid, semi-solid and soft foods was 5.6 (SD  $\pm$  0.9) months.

A total of 172 (52.4%) were introduced complementary food by 6–8 months, 167(50.9%) received the recommended minimum meal frequency, 73 (22.3 %) received the recommended minimum dietary diversity and only 39 (11.89%) received the recommended minimum acceptable diet and 216(65.8%) didn't met requirement.



**Optional breast-feeding indicators and core IYCF indicators.**

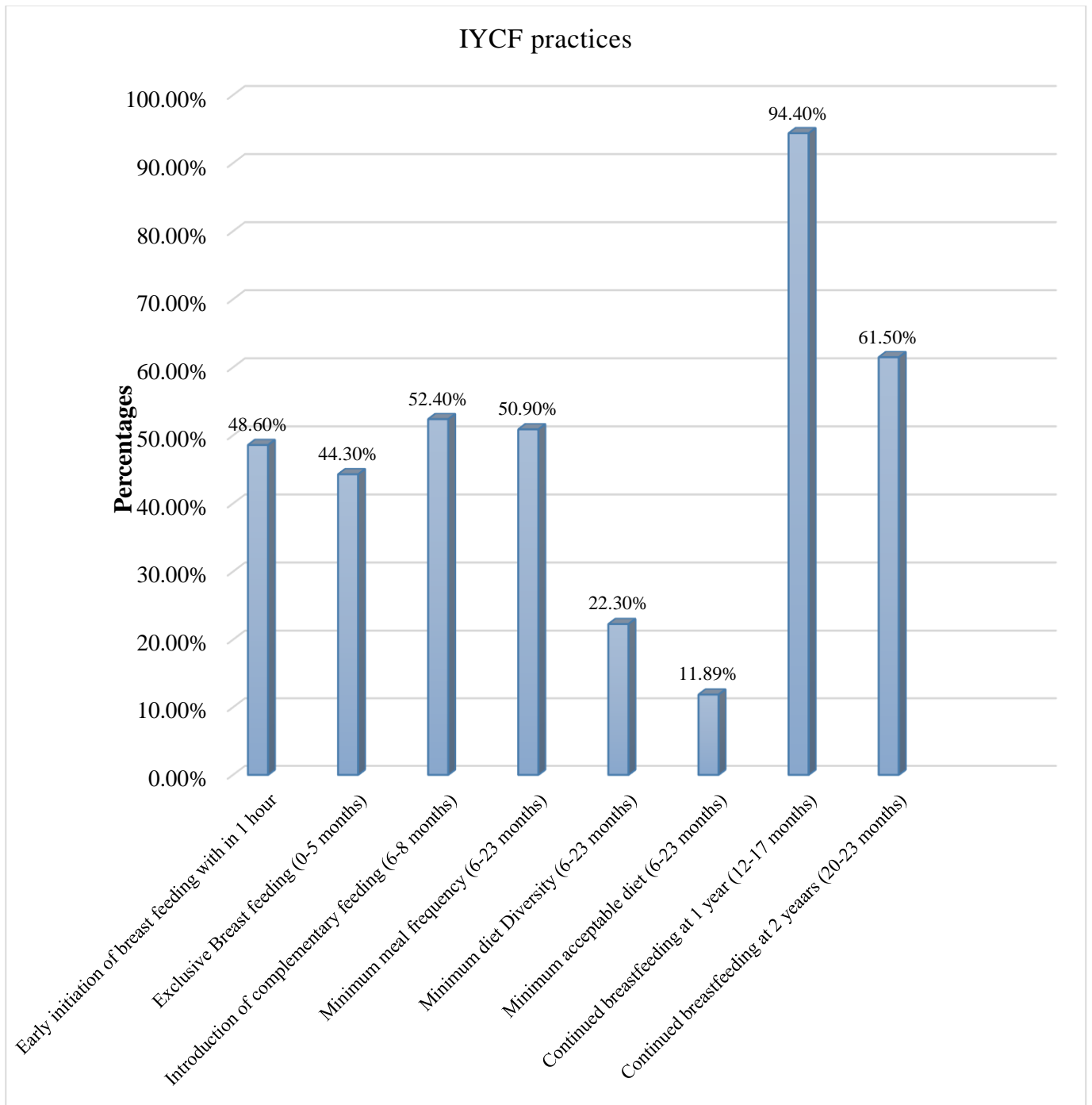


Figure 4 . IYCF practices from 0-23 months Hadiya Zone, Gibe district, 2017.

The primary food source (99.1%) of children aged 6 - 23 months were grains, tubers and roots, followed by dairy products (64.0%), whereas with very smallest number (4.3%) of children were provided with flesh products (Figure 7).

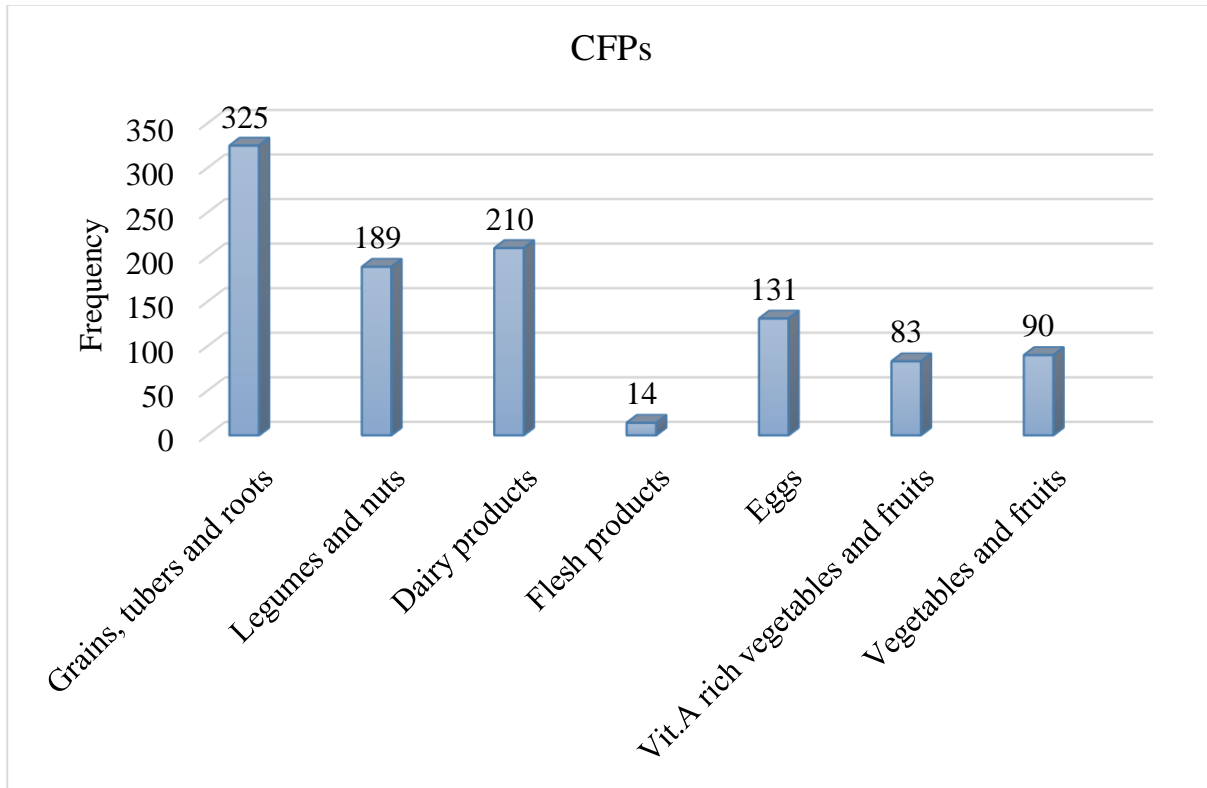


Figure 5. Types of food groups consumed within 24 hours prior to survey by children aged 6-23 months (n=328) in Gibe District, Hadiya Zone, SNNPR, and Ethiopia from March 13 to April 13, 2017.

*Most of them stated that “Even if it is available, we don’t give meat to children below the age of five years. If children start to eat meat at earlier ages, they will share with adults and want to eat more. We get meat once a year during Mesikel holiday.”*

Vegetables and fruits are not common in children’s diet.

*Almost all responded that “If children get a variety of fruits like mango and, papaya and if they also get cow’s milk and breast milk, they will be healthy.” “We are not giving them any fruit...therefore most of them are not strong and healthy.” ...”In this area it’s cold and there is hunger.”*

Garlic and herbs like rue were reported given for treatment of abdominal cramp.

*Most of them stated that “Children start eating egg after the age of 1 year. It predisposes the child to diarrhea and vomiting if given before this age.” “We do not give cabbage for children less than two years old; it will cause worms in their stomach.” “We don’t give meat to children below 5 years. Because they can’t chew and swallow meat at this age. I will give roasted meat after the age of 5 years”.*

Health extension workers (HEWs) have different opinions on feeding a variety of foods to children. HEWs have concerns about the availability of certain grains, fruits, and overall income to feed variety of food to children.

*“Families cannot afford. They can only make the porridge from what they have. It is hard because of poverty.” (Hadaye, HP).*

*“I think mothers can do this if they are advised. If they are aware of this and if they can sell what they have at home to buy other foods, they can do it. It doesn’t require much time and money, and it is easy if the different grains are available at home.” (Ratesh, HEW at HPA).*

The role of health workers, opinion leaders, traditional communicators, NGOs and grandmothers in supporting mothers to adequately feed their infants have been highly valued in the area. In addition, increased workload of women, maternal illness or death after delivery, breast milk insufficiency and the involvement of grandmothers, husbands, friends and other family members play an influential role in the early introduction of complementary foods to infants. Also, mothers’ socio-economic status, culture and tradition have been found to have an influence on early introduction of complementary foods. This study presents an analysis and summary of the data collected during the course of the explorative research conducted in the study area.

### 5.6. Knowledge and Attitude of Mother’s on IYCFP

Out of the total 418, 339 (81.1%) of the respondents had sufficient knowledge on IYCFPs. Out of 418 respondents 189 (45.2%) had positive attitude towards IYCFP.

### 5.7. Infant and Young Child Feeding Practice Status

Indicators used to construct comprehensive infant and young child feeding practices to classify into appropriate and inappropriate feeding were exclusively breast feeding, timely initiation of breast feeding, bottle feeding, timely introduction of solid, semi-solid and soft foods, minimum food diversification, minimum meal frequency and continued breast feeding.

Based on the above indicators of IYCFPs, 284 (67.9%)[95% CI; 63.6-72.5]of under 24 months children were fed inappropriately.

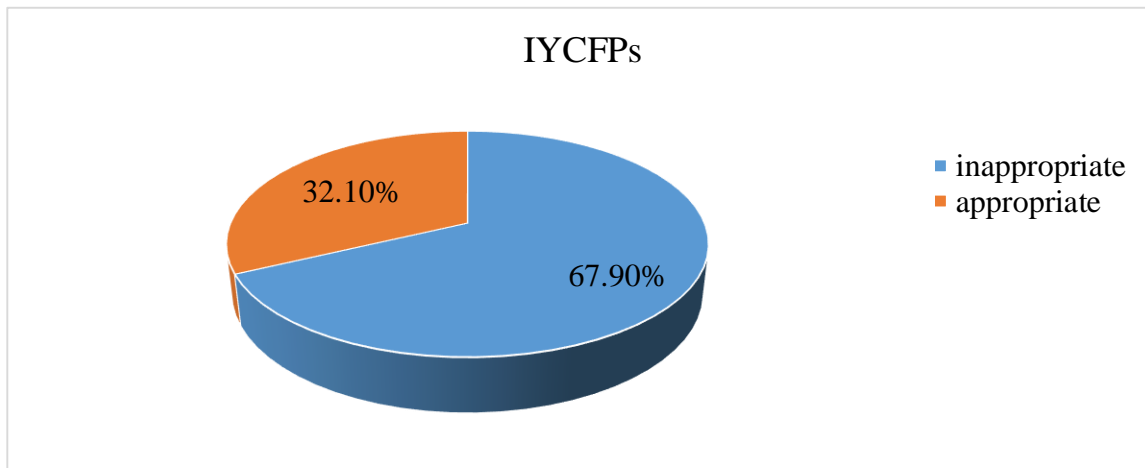


Figure 6. IYCFPs of children under 24 months in Gibe District, Hadiya Zone, SNNPR, and Ethiopia from March 13 to April 13, 2017.

### Supply side factors

#### Source of Drinking Water

Almost more than half of mothers get drinking water from well 312(74.6%), but only 11.5% of mothers use by boiling, majority of them use simply by storing. Most of the mothers 52.3% >1hrs walk to get maternal and child health services at health institutions.

### 5.8. Support and source of information for IYCF.

This study assessed the support the mothers had received for their IYCF practices and the findings are depicted as; key person supporting through words of praise, providing reassurance and opportunity to discuss IYCF. About more than a third 308 (73.7%) of the mothers cited the

child's father and Health worker 61(14.6%) as key persons who supported BF through praising the mothers for their efforts. The mother-in-law accounting to 17(4.1%) had the least proportion of providing words of praise to the mothers in support of IYCF.

Slightly less than half 137 (32.8%) of the mothers cited the health worker as the person who provides reassurance on mothers' practice of breastfeeding. Own mother accounted for 4 (1.0%), child's father 237 (56.7%), mother in law 39 (9.3%), friend 1(0.2%) and 33 (8.8%) of the mothers had no one to reassure them on breast feeding.

About less than half 176(42.1%) of the mothers cited the health worker as the person who gave them opportunity to discuss IYCF practices, 26 (6.2%) their own mother, 132(31.6%) their child's father, 84(20.1%) the mother-in-law as shown in Table 5. These findings indicated that the health workers and the child's father were key persons in offering the mothers IYCF support.

Majority 289 (69.1%) of the mothers hadn't received IYCF information while 129(30.9%) of the mothers had received IYCF information. The mothers stated that the IYCF information was received from mass media (all Radio and television stations 48(11.5%), magazines 4(1%), books 5(1.2%), Health professionals 196(46.9%) and others 12 (2.9%) of the mother had received IYCF information as shown in the table.

Table 5. Support and source of information for IYCF in Gibe district, Hadiya Zone, SNNPR, and Ethiopia from March 13 to April 13, 2017.

Variables		Number	Percent
<b>Support of praise for IYCF efforts and giving opportunity to discuss on IYCF</b>	Child's father	308	73.7
	Health workers	61	14.6
	Mother in law	31	7.4
	Own mother	12	2.9
	No one	6	1.4
Support of Providing reassurance on IYCF	Child's father	237	56.7
	Health worker's	137	32.8
	Mother in law	39	9.3
	Own mother	4	1
	Friend	1	0.2

Support of giving opportunity to discuss on IYCF	Health workers	176	42.1
	Child's father	132	31.6
	Mother in law	84	20.1
	Own mother	26	6.2
<b>Decision maker on child feeding</b>	Mother	345	82.5
	Grandmother	39	9.4
	Father	24	5.7
	Others	10	2.4
<b>Sources of IYCF practice information</b>	Health professionals	208	49.8
	Radio/TV	48	11.5
	Books	5	1.2
	Magazines	4	1
	Others	12	2.9

### 5.9. Factors Associated with Infant and Young Child Feeding Practice Status

According to bivariate logistic regression, occupation, mother educational status, husband occupation, husband educational status, family size, socio economic status, ANC visit, IYCF information, place of delivery, birth attendant, PNC, number of children, age of child, birth order and attitude of mothers toward IYCFP were significantly associated ( $P < 0.25$ ). Multiple logistic regression models to identify independent predictors of IYCFP and control confounding factors.

Assessment of association between infant and young child feeding practices and socio-demographic status of respondents and maternal health characteristics and child characteristics was made by employing binary logistic regression model.

Multiple analyses, adjusting possible confounding variables, husband occupation, socio economic status, ANC, number of children, age of child and attitude of mothers were significantly associated at  $P < 0.05$  with infant and young child feeding practices. On the other hand, occupation of mothers, mother educational status, husband education status, family size, birth interval, birth order, birth attendant, IYCF information, place of delivery and PNC were not statistically associated ( $P > 0.05$ ) with IYCFP in this study (Table 6).

Mothers who were lower income 3.1 times more likely to practice inappropriate feeding when compared with high income [AOR = 3.11 (1.36, 7.07)].

The odds of inappropriate infant and young child feeding practices are significantly higher for children their fathers were government employee than for merchant [AOR = 4.08 (1.65, 10.04). Infants in the age group 0 - 5 months were 2.4 times more likely to practice inappropriate IYCF as compared to those children with age group 18 - 23 months [2.42 (1.02, 5.72)]. Mothers who didn't had ANC visit 2.1 times more likely to practice inappropriate IYCF when compared to those who had ANC visit [AOR = 2.1(1.22, 3.36)].

Mothers who had negative attitude towards IYCFPs 2.4 times more likely to practice inappropriate IYCF when compared with those who have positive attitude [AOR = 2.35 (1.43, 3.84)]. Women with 3 - 4 children 2 times more likely practice inappropriate IYCF compared with women with children 1 - 2 [AOR = 1.99 (1.08, 3.64)]. The study showed that the demand side factors are the major predictors of IYCF practices.

Table 6. Multivariable logistic regression models predicting IYCFP, the supply and demand side factors Gibe District, Hadiya Zone, SNNPR, and Ethiopia from March 13 to April 13, 2017.

IYCFP					
Variables		Inappropriate (%)	Appropriate (%)	COR(95% C.I)	AOR(95% C.I)
<b>Educational status of mothers</b>	No	140(82.4)	30(17.6)	3.29(1.31, 8.31)*	4.77(0.97, 23.48)
	Primary	107(64.1)	60(35.9)	2.95(1.17, 7.43)*	4.16(0.84, 20.55)
	Secondary	29(48.3)	31(51.7)	2.47(0.89, 6.82)	2.58(0.47, 13.97)
	Higher	7(35)	14(65)	1	1
<b>Occupational status of mother</b>	Government	6(31.2)	11(68.8)	1	1
	Private	27(43.5)	35(56.5)	1.70(0.53, 5.47)	0.51(0.05, 5.40)
	Farmer	81(73)	30(27)	5.94(1.91, 18.52)*	0.25(0.02, 3.10)
	Housewife	170(74.6)	58(25.4)	6.45(2.15, 19.34)*	0.44(0.04, 5.14)
<b>Educational status of husband</b>	No	32(84.2)	6(15.8)	10.26(3.42, 30.80)*	0.81(0.09, 7.50)
	Primary	160(78)	45(22)	6.84(3.24, 14.44)*	1.56(0.32, 7.62)
	Secondary	59(58.4)	42(41.6)	2.70(1.24, 5.88)*	0.90(0.22, 3.70)
	Higher	21(35.6)	38(64.4)	1	1
<b>Occupational status of husband</b>	Government	8(25.8)	23(74.2)	6.46(2.88, 14.48)*	<b>4.08(1.65, 10.04)*</b>
	Private	37(71.2)	15(28.8)	2.60(1.32, 5.10)	1.60(0.76, 3.41)
	Farmer	169(73.5)	61(26.5)	1.05(0.58, 1.92)	4.52(0.69, 29.55)
	Merchant	54(72.0)	21(28.0)	1	1
<b>Family size</b>	1-3	18(38.3)	29(61.7)	1	1
	4-6	139(65.9)	72(34.1)	0.15(0.75, 0.31)*	0.38(0.02, 7.35)
	≥7	127(79.4)	33(20.6)	0.50(0.31, 0.81)*	0.58(0.02, 17.07)
<b>Income</b>	Lower	38(45.8)	45(54.2)	2.50(1.23, 5.04)*	<b>3.11(1.36, 7.07)*</b>
	Low	56(69.1)	25(30.9)	0.81(0.41, 1.59)	2.71(0.66, 11.07)
	Medium	59(68.6)	27(31.4)	0.79(0.40, 1.54)	2.18(0.53, 9.01)
	High	69(82.1)	15(17.9)	1.65(0.79, 3.48)	2.57(0.78, 8.48)
	Higher	61(72.6)	23(27.4)	1	1
<b>Age of child (month)</b>	0-5	86(95.6)	4(4.4)	3.90(1.81, 8.43)*	<b>2.42(1.02, 5.72)*</b>
	6-11	95(68.8)	43(31.2)	1.65(0.88, 3.08)	2.00(0.67, 5.96)
	12-17	63(50.4)	62(49.6)	0.73(0.39, 1.35)	0.76(0.24, 2.40)
	18-23	36(55.4)	29(44.6)	1	1
<b>Birth order</b>	1-2	18(36.7)	31(63.3)	0.13(0.07, 0.26)*	0.18(0.00, 8.09)
	3-4	127(63.8)	72(36.2)	0.40(0.24, 0.64)*	0.54(0.05, 6.43)
	≥5	138(81.7)	31(18.3)	1	1
<b>No. of children</b>	1-2	45(43.7)	59(57.3)	1	1
	3-4	115(71.4)	46(28.6)	1.89(1.12, 3.20)*	<b>1.99(1.08, 3.64)*</b>
	≥5	123(80.4)	30(19.6)	0.65(0.36, 1.16)*	0.77(0.39, 1.49)
<b>ANC</b>	Yes	150(56.6)	115(43.4)	1	1
	No	132(86.3)	21(13.7)	1.75(1.15, 2.67)*	<b>2.1(1.22, 3.36)*</b>
<b>Place of delivery</b>	HI	81(54.7)	67(45.3)	1	1
	Home	198(73.3)	72(26.7)	2.40(1.57, 3.67)*	4.35(0.65, 2.83)
<b>Birth attendant</b>	HP	79(56.1)	62(43.9)	1	1
	TBA	118(73.3)	43(26.7)	2.43(1.49, 3.97)*	0.24(0.03, 1.92)
	Others	87(75.0)	29(25.0)	2.30(1.35, 3.89)*	0.29(0.04, 2.11)
<b>PNC</b>	Yes	74(60.7)	48(39.3)	1	1
	No	212(71.6)	84(28.4)	1.60(1.03, 2.48)*	0.76(0.34, 1.72)
<b>IYCF information</b>	Yes	106(52.2)	97(47.8)	1	1
	No	45(72.6)	17(27.4)	2.40(1.29, 4.47)*	1.79(0.71, 4.51)
<b>Attitude of mothers</b>	Negative	168(73.4)	61(26.6)	3.25(2.10, 5.00)*	<b>2.35(1.43, 3.84)*</b>
	Positive	115(60.8)	74(39.2)	1	1

\* Statistically significant at p-value < 0.05, 95% C.I.



## 6. Discussion

This study assessed the demands-supply side factors of infant and young child feeding practice status and associated factors in Gibe District, SNNPR. The magnitude of inappropriate IYCFP in the study area is 67.9%, which is high. In this study, it was found that majority (99.3%) of mothers practiced ever breastfeeding. This result is almost similar with the study done in Mekelle town in 2011 which was 98.9% (50) and Ethiopian ever breast feeding rate was 98% in 2011(14). But it is higher than the ever breastfeeding in Arbaminch which was 95.8% in 2011(15). This high rate of breastfeeding in study may be due to the fact that breast-feeding practice is a common, accessible, acceptable and norm in the society.

In order to reduce malnutrition in a developing country like Ethiopia, adequate, safe and acceptable child feeding practice is crucial. For this reason, WHO and UNICEF have recommended eight core infant feeding practices (2, 3). In this study we found that 52.4% of the mothers initiated complementary feeding at six month, and 48.60% had initiated breastfeeding within 1 hour after birth. About half (50.9%) of the children received the minimum meal frequency, 22.3% achieved minimum dietary diversity and 11.89% of them received the minimum acceptable diet.

Breastfeeding pattern in developing countries is almost universal; however sub-optimal feeding practices such as delayed initiation of breastfeeding, non-exclusive breastfeeding, pre-lacteal feeding and bottle feeding are prevalent in most of the sub-Saharan countries (28). The number of the mothers who initiated breastfeeding within one hour after birth in this study (48.60%) is less than reported in a study conducted in Enderta zone of northern Ethiopia (68.3%) (36), but it is more than the number reported by EDHS (12). It is recommended that a neonate should be breastfed immediately after birth and should be exclusively breastfed up to six months of age. But this is a rare phenomenon in Ethiopia. In our study, for example, about four in ten mothers did not initiate breastfeeding on time, which is a clear manifestation of the severity of the feeding problem in the community.

According to the WHO, complementary food is important to prevent malnutrition and it should be introduced at 6 months of age, when the infant's stomach is ready to digest other foods. In this study, 52.4% of the mothers had initiated complementary feeding by the sixth month of the

child's age, which is less than the percentage of mothers reported in similar studies in northern Ethiopia (79.7%), Mekelle (62.8%), and Harar (54.4%) (29-31), and nationally (61%) (32). This low proportion of initiation of breast feeding within 1 hour of delivery according to recommendation of WHO may be due to socio-cultural constraints or may be due to the mothers don't know when to initiate breast feeding after delivery.

WHO/UNICEF discourages the use of pre-lacteal foods without being medically indicated (27). It is the recommendation of UNICEF that babies should be fed with cups and spoons. Bottle-feeding is not recommended because improper sanitation and formula preparation with bottle-feeding can introduce microorganisms to the infant that increase the child's risk of illness and malnutrition (27), but this study found that about 20.9% of mothers fed their children using bottle. This finding is less than national data (28.5%) (14), also lower than a study in Addis Ababa (54.2%) (36). It is found that deprivation of colostrum, duration of breastfeeding, use of pre-lacteal feeds, age of introduction of complementary feeding and method of feeding are the main factors contributing to under-five stunting (36). This is may be due to many mothers in the study area perceived that bottle feeding has more benefit than breast feeding (23.8%) and increases growth of children (6.9%).

Although, Global strategy on infant and young child feeding recommends feeding colostrum's and discourages pre-lacteal feeds, in this study 65.30% of mothers gave colostrum's to their baby. This finding was lower than the finding of Mekelle town (82%) in 2011(50) and Arbaminch area (89.8%) in 2011(15). This may be justified that in the study area mothers discarded colostrum as they considered that it cause of diseases and abdominal pain (56.9%), dirty (26.4%) and it is water (16.7%)

The prevalence of pre-lacteal feeding in this study is 49.7% which is much higher than the study done in Mekelle town (10.4%) in 2011(50), in south Gonder zone (11.1%) in 2007(36) and 27% in EDHS 2011(14). This result may be due to the traditional practices ("wubaxe") of introducing pre-lacteal feeding especially water (79.7%) in third day of birth for female, in fourth day for males and high home delivery (64.6%) in the study.

This study showed that the prevalence of exclusive breastfeeding for infants less than six months was 44.3%. This result is lower when compared with the findings from Mekelle 60.8% in

2011(50) and Ethiopia (58%) in EDHS 2016(14). This finding is also lower than the national targets (70%) by 2015(13).

*Most of them responded/stated that they used a bottle when the child is less than one year old and that they started to use spoon, cup and their hand after the age of one year.*

To decrease probability of malnutrition and its consequences, in addition to appropriate breastfeeding, children need to receive complementary foods including at least four of the seven food groups after six months of age (14, 36). Prevalence of achieving the minimum dietary diversity was 22.3%, although this is higher than reported by DHS (4.8%) (14), in Tigray (17.8%) (36), and Ethiopia overall (10.8%) (10), it is hardly promising that so few of these children received adequate dietary diversity. In this study, a majority of the children received a diet primarily based on staple foods (grain, roots and tubers), very few of the children received vitamin A rich fruit and vegetables, egg, and flesh foods. Legumes and nuts were more consumed by the 18-23 months age group compared to the other age groups, while other fruit and vegetables were more commonly consumed among 12-17 months age groups.

The percentage of children in our study who achieved minimum meal frequency (50.9%), is less than the magnitude reported from Sri Lanka (88.3%), Bangladesh (81.1%), and Nepal (76.6) (39). Children should achieve minimum meal frequency to increase the probability of reaching the required levels of energy and micronutrient intakes in developing countries with low or average levels of breast milk intake (32). The proportion of the children who received the minimum acceptable diet was 11.89%. This is similar to the number reported in Northern Ethiopia (11.9%) (49), but higher than reported by EDHS (5.2%) (12), this clearly shows that children in the study area are not getting adequate nutrient and energy intakes. The minimum acceptable diet is an indicator of standards of dietary diversity (a proxy for nutrient density) and feeding frequency (a proxy for energy density) and hence is a useful method to track progress of the children feeding.

With respect to dietary diversity, our study indicates that diversity of different food groups offered during the past 24 hours was low, with the lowest rates reported for vitamin A rich fruit and vegetables and flesh foods. Children in the 6–23 months of age group go through a

reasonably rapid dietary transition from exclusive breastfeeding to complementary feeding. Additionally, during this dietary change, they are also prone to some diseases like diarrhea (40, 41). During this period, children need more nutritious food to overcome the adverse effects of such diseases. Unfortunately, the current findings show that the children in this age group were not receiving appropriate complementary foods as recommended by the WHO. Our findings are similar to a national study and another study in the northern part of Ethiopia (12, 41).

Introduction of nutritionally adequate and safe complementary foods promotes growth and good nutritional status among infants and young children. This study revealed that 52.4% of children aged 6 - 8 months receive complementary foods. The finding of this study is higher when compared with EDHS (49%) in 2011(14). This is low when compared with Uganda (75%) (18), Tanzania (92.3%) (19) and Kenya (81%) (8, 40), in 2010. This may be due to mothers' knowledge on what and when to start additional foods to child and their perception that the child is unable to digest foods in this age.

*Almost all mothers have suggested that the gruel and porridge should be prepared at least from two types of cereals. The age for introduction of additional foods ranges from 2 months to 8 months.*

This study also showed that the majority 50.5% of children received minimum meal frequency. However, very few 22.3% children aged 6 - 23 months met the requirements for minimum dietary diversity in the previous day. This is lower than in Tanzania, 38.0% of children age received minimum dietary diversity, but higher minimum meal frequency 35% of children ages 6 - 23 months in 2010(19, 49). In Western Uganda 49% of 6 - 23 months children complemented 3 or 4 times (18). Similarly in South Asia, the minimum meal frequency and dietary diversity was reported by WHO in 2010 to be less than 50% in all countries except Sri Lanka(32). The study finding also high when compared to EDHS 2011 (minimum meal frequency 4% and minimum dietary diversity (5%) (14), this may be due to difference used to calculate minimum meal frequency. In this study the proportion of minimum meal frequency was calculated for 6 - 23 months without considering age specific meal frequency *i.e.* 6 - 8 months, 9 - 11 months and 12 - 23 months.

This study also lower, a community-based cross-sectional study in Southern Ethiopia indicated that the practices of timely initiation of complementary feeding, MMF and MDD were 72.5, 67.3

and 18.8 % among mothers of 6–23 months aged children, respectively. The practice of appropriate complementary feeding was 9.5 %. Child's age (12–17 and 18–23 months) (36).

In this study, 99.1% of food groups given to children are mainly made from grains, roots and tubers, which have relatively low nutrient density. This study also found that, meat products (4.3%), eggs (39.9%) and vitamin A rich foods (25.3%). This is similar with India, consumption of animal origins foods was found to be poor especially for younger age group and less than 8% of all children aged 6 - 23 months had consumed eggs, meat, poultry and fish during the past 24 hours(21).In Tanzania 2010, Proportion of children who were given food made of grains, roots and tubers (93%) and vitamin A rich fruits and vegetables (67.2% ) and animal origin food was very low(19).According to EDHS 2011, foods made from grains (66%) are consumed more often than foods from any other food group (only 15% consumed fruits and vegetables rich in vitamin A,5% of children consumed meat and 8% consumed eggs)(14).This is may be due to negative beliefs of mothers or caregivers or lack of affordability of these foods or inadequate knowledge about the importance of feeding young children variety of foods among mothers and caregivers or associated with household food security.

*Most of them responded/stated that Gruel or porridge is prepared from at least two types of cereals until the child is 2 years old. Vegetables and fruits are not common in children's diet. "Too much food may also predispose them to illnesses."*

*Almost all of them responded/stated that mothers believe the foods are not digestible by children until the age of 5-7 years. Animal-source foods such as meat are expensive. It is not a common practice in the community.*

*Most of them responded/stated that often families are afraid that thick foods will be difficult to swallow and get stuck in the baby's throat. Thick food causes constipation. Extra liquid is added so that it will take less time to feed the baby and make it easier for the young child to eat.*

In the binary logistic regression model, mother occupation, mother educational status, husband occupation, husband educational status, family size, socio economic status, ANC visit, IYCF information, place of delivery, birth attendant, PNC, number of children, age of child, birth order and attitude of mothers toward IYCFP were significantly associated with IYCFPs.

However, inappropriate infant and young child feeding practice was significantly associated with husband occupation, socio economic status, ANC, place of delivery, number of children, age of

child and attitude of mothers after controlling other predictors in the multiple logistic regression model.

Eight infant and young child feeding practices indicators were assessed based on WHO recommendation and used to develop composite variable. Identification of factors affecting IYCFP is important as it can guide implementation of appropriate programs to improve IYCF practices. In this study it was found that only 32.1% of children received appropriate feeding practice. The WHO guidelines on infant and young child feeding practices do not provide the baseline or the minimum standard that needs to be reached nor what percentage should be considered alarming for public health significance. Logically, it is desirable that all children 0 - 23 months meet the recommended feeding practices.

Mothers who were lower income 3 times more likely to practice inappropriate feeding when compared with high income. In this study there was association between mother's monthly income and IYCF practice and it is in line with the study in Saudi Arabia, 2010(35) where low income mothers were more likely practice inappropriate IYCF. In Ethiopia, low income mothers were more likely practice inappropriate IYCF (14).

The odds of inappropriate IYCF practices are significantly 4 times higher for children their fathers were government employee than for merchant. This is line with study done in, Oromia Region. This might be merchants usually stays at home/around, give more attention to their child and have sufficient time, whereas gov't employee might give less attention and obligated to their child early to go to work(47)

Mothers with infants in the age group 0 - 5 months were 2 times more likely to practice inappropriate IYCF as compared to those children with age group 18 - 23 months. Slightly in line with the study Northwest Ethiopia. This might be mother's similar perception about IYCFPs (49). Mothers who didn't had ANC visit 2 times more likely to practice inappropriate IYCF when compared to those who had ANC visit. This finding is consistent with IYCFPs Axum town. This might be because mothers who attend ANC with repeated visits will have a great chance to get maternal health related as well IYCF and child care advices (47)

Mothers who had negative attitude towards IYCFPs 2 times more likely to practice inappropriate IYCF when compared with those who have positive attitude. The finding is consistent with IYCFPs study done in, Oromia Region, This might be mothers with positive attitude would get

advice and accept counseling on IYCFPs by health professionals and HEWs. Women with 3 - 4 children 2 times more likely practice inappropriate IYCF compared with women with children 1 - 2. This finding consistent with IYCFPs study done in Oromia Region (47).

To appreciate similarities and differences of factors associated with inappropriate infant and young child feeding practice in logistic regression specifically supply-demand side factors with other studies are impossible due to lack of study on IYCFP in composite of similar indicators.

The differences in the measurement of the feeding practices, and the real meaning of each practice could be sources of difficulty for building and interpreting composite feeding practice, and perhaps this is also a source of confusion for defining its indices. Despite the lack of a standard definition and the variations in the methods used to construct scores.

## **7. Conclusions and Recommendations**

In conclusion, there is high prevalence of inappropriate IYCF practice in the study area. This prevalence is not acceptable to ensure good health and better nutritional status of children and to achieve SDGs goal. The study showed high proportion of mothers giving pre-lacteal fed, discarding colostrum's and using nipple bottle for feeding. This study has found significant association in demand and supply side factors with infant and young child feeding practices in the study area.

Being government, poorest socio-economic status, not attending ANC visit, and child age 0 - 5 months, negative attitude of mothers and number of children (3 - 4) were significantly associated with infant and young child feeding practice.

Poor IYCF practices are reported in the present study, apart from the high proportion of children who were breastfed. Even though dietary diversity, minimum acceptable diet of the community are far below the WHO recommendations for IYCF practices. Appropriate IYCF should be a high priority to build the health of future generations.



## **Recommendations**

### **For zonal health department and district health office:**

Concerned body should give high attention that health interventions programs be designed to develop individuals' ability to increase IYCFPs.

### **Health institutions**

BCC are recommended at individual and community level in attaining healthy behaviors during the vulnerable period from pregnancy through the first two years of life. Interventional initiatives should focus on improving socio-economic status, mobilizing communities and families to support IYCF practices through the media, through networks such as the Women's Forum and ANC utilization for further improvement of IYCFP. Providing continues health education about the IYCFPs, this can reduce the negative attitude of mothers in the community. Promoting and counselling mothers through IEC and BCC materials specific to IYCFPs.

### **For Health extension workers and health professional**

Special emphasis should be given for mothers with low income statuses, those who do not attend ANC follow up and negative attitude giving continues health education. To change their wrong attitude and perception about IYCFPs of those mothers. Health professionals should provide mothers skilled counseling and help for IYCFPs, for instance at well-baby clinics, during immunization sessions, and in- and out-patient services for sick children, outreach services nutrition services, and reproductive health and maternity services during prenatal, delivery and post natal period. Health information should be given to mothers regarding all components of IYCF practices during their visits/contacts with health workers/health extension.

### **For Non-governmental organizations**

Developing evidence-based guidelines, supporting research projects and to facilitate achievement of the strategy's IYCF. Supporting social-mobilization activities, for example using the mass media to promote IYCF and educating media representatives.

### **For Researchers**

To develop and implement better strategy to improve IYCF , further research should be conducted by using analytic study design to show cause and effects to understand deeply socio-cultural and behavioral related factors towards IYCF.

Further, interventional initiatives should focus on improving socio-economic status, attitudes affect IYCFPs and ANC utilization for further improvement of IYCFP. In addition, longitudinal studies also needed to carefully track IYCFP from birth to 24 months of age and causally link these practices with individual child.

**Strength and limitation of this study**

The current study has strengths like triangulating of both quantitative and qualitative approaches provided. Child feeding indicators were examined based on standard definitions formulated by WHO. It employed community based study and used adequate sample size. Nevertheless, this study has its own limitations. There is social desirability bias since it is self-report. A mother may have difficulty of remembering when she initiated breastfeeding and complementary feeding practice for her child; as a result, timely initiation of breastfeeding, exclusive breastfeeding, and timely initiation of complementary feeding is subjected to potential recall bias.

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**Annex I: Information sheet**

Jimma University, college of health sciences, Health education and Behavioral sciences. Study on Supply and demand side factors influencing infant and young child feeding at Gibe District, Hadiya Zone, and SNNPR.

**Greeting:**

Hello, My name is\_\_\_\_\_. I am here today to collect data on supply and demand side factors influencing infant and young child feeding. The study is being conducted by Mr. Tesfaye Feleke from Jimma University, Health education and Behavioral sciences, post graduate program. The objective of this study is to assess supply and demand side factors influencing infant and young child feeding. I request you to take part in this study and to respond genuinely. Your cooperation and willingness is greatly helpful in identifying problems related to supply and demand side factors in infants and young children. The study will be conducted through interviews and you are being asked for a little of your time, about 25 min, to help us in this study.

Your name will not be written in this form and will never be used in connection with any information you tell us. There is no possible risk associated with participating in this study except the time spent for responding to the questionnaire. All information given by you will be kept strictly confidential. Your participation is voluntary and you are not obligated to answer any question you do not wish to answer. If you feel discomfort with the question, it is your right to drop it any time you want. If you have questions regarding this study or would like to be informed of the results after its completion, please feel free to contact the principal investigator.

Address of the principal investigator:

Tesfaye Feleke Gadore

Cell phone: +251 916293833, E-mail: [tesfayefeleke33@gmail.com](mailto:tesfayefeleke33@gmail.com)

Are you willing to participate in this study?

- 1. Yes - ..... Continue to the next page
- 2. No- ..... Skip to the next participant

**Annex II: Consent form**

In signing this document, I am giving my consent to participate in the study titled “Supply and Demand side factors influencing IYCF practice among mothers of children aged less than 24 months a community based study at Gibe District, Hadiya Zone, and SNNPR”.

I have been informed that the purpose of this study is to assess supply and demand side factors influencing infant and young children. I have understood that participation in this study is entirely voluntarily. I have been told that my answers to the questions will not be given to anyone else and no reports of this study ever identify me in any way. I have also been informed that my participation or non-participation or my refusal to answer questions will have no effect on me. I understood that participation in this study does not involve risks.

I understood that Tesfaye Feleke is the contact person if I have questions about the study or about my rights as a study participant.

Respondent’s signature \_\_\_\_\_

If no, skip to the next participant

Date of interview: \_\_\_\_\_ Time started: \_\_\_\_\_ Time finished: \_\_\_\_\_

Interviewer Name \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_

Supervisor’s name \_\_\_\_\_ Signature \_\_\_\_\_

**Results of interview questionnaire**

- 1. Completed
- 2. Refused
- 3. Partially completed

### Annex III: English version Questionnaire

Jimma University, college of health sciences, Health education and Behavioral sciences  
Questionnaire for assessment of supply and demand side factors influencing infant and young children less than 24 months age in Gibe District, Hadiya Zone, SNNPR.

001. Questionnaire ID number \_\_\_\_\_

002. Address: kebele \_\_\_\_\_

Note: Encircle from the given option and write if any other idea or answer is given  
Questionnaires

#### PART I. Socio-demographic characteristics of mothers with their index child (age 0-24 years)

No	Question	Response	Skip
101	Mother's age (in years)	_____ Years	
102	Marital status	1. Married      2. Single 3. Divorced    4. widow 5. Separated   6. cohabitated	
103	What is your religion?	1. Orthodox    2. Muslim 3. Catholic    4. Protestant 5. Others(specify)_____	
104	Ethnicity	1. Hadiya      2. Kambeta 3. Gurage      4. Amhera   5. Others____	
105	Maternal education	1. No education   2. Primary 3. Secondary      4. Higher	
106	Occupation of mother	1. Government 2. Private 3. Farmer 4. Housewife	
107	Paternal education	1. No education   2. Primary 3. Secondary      4. Higher	
108	Occupation of husband	1. Government 2. Private 3. Farmer 4. Merchant	
109	Do have: A radio A TV Do you read magazines, news, or books	1. Yes            2. No 1. Yes            2. No 1. Yes            2. No	
110	Monthly income of the household	1. <=500        2. 501-1000 3. 1001-1500   4. 1501-2000 5. 2000&above   6. Don't Know	
111	How many children do you have	_____ number	
112	Current child's sex	1. Male            2. Female	



113	Child's age	_____ Months	
114	Birth order	_____ th.	
115	Birth interval between the youngest and his/her immediate elder	1. Nulliparous birth 2. Less than 24 3. More or equal to 24	
116	Mother's perception of birth size	1. Small            2. Normal 3. Large            4. Don't know	
<b>PART II. Maternal health related factors</b>			
201	Did you visit health facility for ANC during your pregnancy for this child?	1. Yes 2. No	If No skip to 205
202	If yes how many times did you receive (number of antenatal care) during your time of pregnancy for this child?	1. 1-2 times        2. 3-4 times 3. >4 times        4. Don't know	
203	Did you get health education on breast feeding at any of your visit?	1. Yes 2. No	If No skip to 205
204	Where did you gave birth to this child/Place of delivery	1. Home            2. Hospital 3. HC            4. Other (specify)____	If 1 skip to 207
205	If the place of delivery is hospital/ health center was (name) delivered by:	1. Vaginal delivery 2. Caesarean section	
206	Who helped you during delivery?	1. TBA                            2. HEW 3. Health professional    4. Relatives	
207	Did you receive advice/ information on BF at PNC?	1. Yes 2. No	
<b>PART III. Breast feeding and complementary feeding practices of IYCF practice</b>			
301	Have you ever breastfeed the child?	1. Yes 2. No	If Yes, skip 303
302	How long after birth did you first put the Child to breast?	1. Within 1 hour        2. 1- 24 hr. 3. 1-3 days            4. After 3 days	
303	Did you give the child pre-lactation food/fluid?	1. Yes 2. No	If No skip to 307
304	If yes, what did you gave him (her)?	1. Butter            2. Sugar solution 3. Salt solution        4. Cow's milk 5. Water            6. Other (specify)____	
305	Did you squeeze out and throw the first milk?	1. Yes 2. No	If No skip to 309

306	Why didn't you give it for your child?	1. It is dirty 2. It creates abdominal pain to the baby 3. Others(specify)_____	
307	Was the child breastfed yesterday during the day or at night?	1. Yes 2. No	If No skip to 315
308	How many times did you breast feed in 24 hours?	_____ times	
309	Did you give the child additional food or fluid other than breast milk in the past 24 hours?	1. Yes 2. No	If Noskip to 314
310	When do you breastfeed?	1. On demand      2. When child cries 3. On schedule      4. On convenience	
311	At what age did the child stop breast feeding?	1. Not weaned      2. _____ months	
312	Have you told to put baby on breast immediately after birth?	1. Yes 2. No	
313	Have you ever breast fed?	1. Yes                  2. No	
314	Age of starting complementary feeding	1. <6 months      2. At 6 months	
315	Have you started timely complementary feeding (6-9 months)?	1. Yes                  2. No	
316	Did ( <i>NAME</i> ) eat any solid, semi-solid, or soft foods yesterday during the day or at night?	1. Yes 2. No	
317	How many times did ( <i>NAME</i> ) eat solid, semi-solid, or soft foods other than liquids yesterday during the day or at night?	Number of times _____ Don't know	
318	Did ( <i>NAME</i> ) drink anything from a bottle with a nipple yesterday during the day or night?	1. Yes 2. No	
319	Did you feed your child per day?	1. Yes                  2. No	
320	Did you include snacks between foods?	1. Yes                  2. No	
321	Did you hear any information about Infant and young child feeding?	1. Yes 2. No	
322	From where did you hear this Information?	1. During ANC(IYCF counselling) 2. HEWs              3. Television 4. Radio              5. Others	

323	Which type of food your child fed? 1. Grain, root and tubers 2. Legumes and nuts 3. Dairy products 4. Vit A rich fruit & vegetables 5. Other fruits & vegetables 6. Flesh foods 7. Egg	1. Yes 2. No	
<b>Part 4 -For Supply side factors</b>			
<b>4.1 Support for IYCF, source of water and distance to health facility</b>			
401	Who has often given you words of Praise For your breastfeeding?	1. Child's father 2. Own mother 3. Mother in law 4. Health worker (CHN) 5. No one 6. Others, Specify__	
402	Who has ever reassured you on breast feeding issues?	1. Child's father 2. Own mother 3. Mother in law 4. Health worker 5. Friend 6. Others, Specify	
403	Who has ever given you opportunity to discuss IYCF issues?	1. Friend 2. Own mother 3. Mother in law 4. Health worker 5. Others, Specify_____	
404	Who has ever given you a visit to support you for IYCF?	1. Women group 2. Own mother 3. Mother in law 4. Neighbors 5. Church 6. Others, Specify	
405	Have you ever had Concerns/questions On IYCF?	1. Yes if yes, go to 411 2. No	
406	Who responded to your concerns to your satisfaction?	1. Neighbor 2. Mother in law 3. Own mother 4. Health worker 5. Others, Specify _____	
407	What was the Source of (name) 's drinking water?	1. Well 2. Bore hole 3. Rain 4. Tap 5. Pipe 6. River 7. Others	
408	Did you do anything to (name) 's drinking water before giving to him/her?	1. Yes, if yes, go to 403 2. No	
409	What did you do to (name) 's drinking Water?	1. Boiling 2. Filter 3. Add chlorine 4. Store 5. Others, Specify_____	

410	Reason for delayed infant and young child feeding? Affordability (supply side).	1. Did not know about IYCF. 2. Health Center is far 3. Lack of money 4. Thought the child would get better 5. Wanted to try home remedies first 6. Absence of responsible person 7. Infant don't eat too much 8. Other_____	
411	If you identify /recognize any sickness to your infant how many hours /days you take to show to the health care provider/Doctor?	1. <30 min                      2. 1 Hrs. 3. 1-3 Hrs.                      4. 4-5Hrs 5. > 6Hrs	
<b>4.2 Sources of information on IYCF</b>			
412	Have ever received IYCF information?	1. Yes, if yes, go to 413 2. No	
413	What was the source of Information?	1. Radio, TV 2. Books 3. Internet 4. Magazines 5. CHN/HEWs 6. Others, Specify_____	
414	Which information did you find useful?	1. Duration of BF    2. Frequency 3. Management of Bf difficulties. 4. Complementary feeding 5. Others, Specify_____	
415	Which method of giving support for IYCF do you think is the best?	1. Women's Groups. 2. One to one 3. Health facility based 4. Community based 5. 1 to 5 network        7. Phone/Internet	
416	Who motivated you Most to breast feed and complementary feeding?	1. Own mother 2. Mother in law 3. Child's father    4. Friend 5. Health worker 6. Others	
417	Are you still Breast feeding?	1. Yes If yes, go to 418. 2. No	
418	What were your reasons for stopping breastfeeding?	1. No enough breast milk 2. Child cry a lot 3. Breast problems 4. Advice from others; 5. Others, Specify_____	
<b>Part 5 Knowledge questions</b>			
501	What do you think should the first feed of a newborn baby be?	1. Water 2. Glucose water 3. Breast milk 4. Infant formula milk 5. Medicines 6. Other (Specify) 7. Do not know	

502	How soon after birth should a baby start breastfeeding?	Hours_____ Do not know	
503	What do you think just delivered, do with the first yellow breast milk?	1. Give it to the baby 2. Throw it away 3. Other (Specify) _____ 4. Do not know	
504	At what age should a baby start taking water?	1. Months_____ 2. Do not know	
505	For how long do you think should a baby receive only breast milk and nothing else?	1. Months_____ 2. Do not know	
506	Until what age can a baby continue to drink breast milk?	1. Months_____ 2. Do not know	
507	What do you think are the advantages of breastfeeding for the baby?	1. Perfect food for babies 2. Healthy baby/Protects against diseases 3. Bonding between mother and baby 4. No advantages 5. Do not know	
508	What do you think are the advantages of breastfeeding for you?	1. Easy/Less trouble 2. Helps with child spacing 3. Bonding between mother and baby 4. Free 5. Mother loses weight faster 6. No advantages 7. Do not know	
509	In your opinion, at what age should a baby start taking soft foods?	1. Months_____ 2. Do not know	

**Items measuring maternal attitudes towards Breast-feeding IYCF practices.**

Items Measuring Maternal Attitudes towards Breast Feeding. Read the following statements very carefully and write your choice from the given for alternatives which are “Strongly disagree”/SD, “Disagree”/D, “Neutral/Don’t know”/N, “Agree”/A, “Strongly agree” SA, by putting a thick mark “☐” on the space provided corresponding to each statement.

S. No	Statement	SD	D	N	A	SA
		1	2	3	4	5
1	I breast fed my child on my own interest					
2	I breast fed just only to avoid pregnancy					
3	I breast fed only because I have nothing to feed					
4	Although I don't have sufficient milk, I don't refrain from breast feeding					
5	I hate breast feeding because it is time taking					
6	I prefer breast feeding to the mistrusting feeding of care takers					
7	God created breast on me to feed my child					
8	Breast feeding beyond 6 months is improper					
9	I dislike breast feeding because it makes my appearance thin					
10	Breast feeding distorts the shape of my breast					
11	Because others reveal concern for me I like breast feeding					
12	Encouragement of family members made me love breast feeding					
13	As it is our culture, breast feeding should not be neglected					
14	Now a days breast feeding is becoming old fashion					
15	Breast feeding keeps me with my child in close proximity					
16	Breast feeding makes the child healthy and strong					
17	Breast feeding is a difficult way of infant feeding					
18	Generally breast feeding is an enjoyable practice					

**Items Measuring Maternal Attitudes towards Complementary Infant Feeding**

S. No	Statement	SD1	D	N	A	SA
			2	3	4	5
1	I provide complementary foods because it makes my infant fat					
2	I have enough money to buy complementary food items instead of suffering myself by breast feeding					
3	My breast milk is not sufficient to my infant so just after birth I like to introduce complementary foods to my infant					
4	Since others can help me by providing complementary foods I like it					
5	Breast feeding makes my appearance thin so I like to give complementary foods to my infant					
6	Providing my infant with complementary foods make him/her healthy and strong					
7	After six months in addition of breast feeding complementary foods are preferable.					

**Thank you for your cooperation!!**

## Annex 2

### Focused Group discussion /FGD GUIDE

Good morning/afternoon.

My name is \_\_\_\_\_. We are conducting a study on supply and demand side factors influencing infant and young child feeding in Gibe district. You are kindly requested to be included in this study, which will have an importance in improving maternal and child health services. The study has approval from Jimma University. “May I continue?” The discussion will take about 60-90 minutes. No information concerning you, as individual or a group will be passed to another individual or institution without your agreement. Your participation is voluntary and you have the right not to participate fully or partially. We have also a tape recorder for information this is also based on your permission. Only honest answers would contribute to improvement of health planning.

If agreed, give codes and start.

Kebele FGD conducted .....

Date of FGD conducted: .....

#### Participants back ground

(Don't write their name, under the column headed discussant code)

S/N	Discussant code	Age	Educational background	Gravidity	Parity	Gestation age (Months)



## **FGD Guide**

1. What do you think Child feeding practices, beliefs and opinions IYCF?
  - a. Exclusive breastfeeding
  - b. Bottle feeding
  - c. Complementary foods
  - d. Animal-source foods
  - e. Diet diversity
  - f. Desired consistency of complementary foods
2. How optimal feeding is needed in the first 2 years of life?
3. When does malnutrition start and how?
4. What do you think the challenge of using traditional complementary foods?
5. What traditional beliefs and misconceptions affect optimal IYCF?  
Probe, why...how... traditional beliefs and misconceptions affect IYCF in the community?
6. What are barriers that can affect IYCF behavior of mothers with infant 0-24 months?
7. What is your counseling knowledge, practice and opinions IYCF?

**Thank you for your cooperation!!**

## **In depth interview /IDI guides**

### **KEY INFORMANT IN-DEPTH INTERVIEW GUIDE LINE**

Good morning/afternoon!

My name is \_\_\_\_\_. I represent the research team from Jimma University. We are conducting in-depth interview with individuals who are selected purposively based on their experience and rich source of information concerning infant and young child feeding practices in this community. Thus, this interview is prepared for this purpose to get appropriate information on concerning infant and young child feeding practices in Gibe district. The information that we will obtain using this interview will be used only for research purpose and, we need to assure you that confidentiality of your response will be kept. The study has no risk to you and your family members but time consuming. Therefore, I politely request your cooperation to participate in this interview. You do have the right not to respond at all or to withdraw in the meantime, but your input has great value for the success of our objective.

#### **Part I: General Information**

1. Position (responsibility) \_\_\_\_\_
2. Work experience in the area \_\_\_\_\_

#### **Part II: Socio demographic information**

1. Age: \_\_\_\_\_
2. Sex: \_\_\_\_\_
3. Educational status and qualification \_\_\_\_\_

### **In depth interview /IDI guides**

1. What do you think Child feeding practices, beliefs and opinions IYCF?
  - a. Exclusive breastfeeding
  - b. Bottle feeding
  - c. Complementary foods
  - d. Animal-source foods
  - e. Diet diversity
  - f. Desired consistency of complementary foods
2. How optimal feeding is needed in the first 2 years of life?
3. When does malnutrition start and how?
4. What do you think the challenge of using traditional complementary foods?
5. What traditional beliefs and misconceptions affect optimal IYCF?  
Probe, why...how... traditional beliefs and misconceptions affect IYCF in the community?
6. What are barriers that can affect IYCF behavior of mothers with infant 0-24 months?
7. What is your counseling knowledge, practice and opinions IYCF?

**Thank you for your cooperation!!**

## Hadiyisi xamicha

### Luxxi 1: Hegeqi duha'a mo'o amo'i xamicha chiluwwi (0-24) umuri affebe'e

Xig	Xammicha	Dabacha	Urima/higimma
101	Amaki umuri	_____hincho	
102	Alibach/tidali ogori	1. Agiso'okotanne 2. Mulateme/agiso'ibeetane 3. Tito'okotane 4. Mini-anichilehakkokotanne 5. Anani'ikookotanne 6. Mahimibeetane	
103	Ki ammanati marucho?	1. Oritodoxa 2. Isilamma 3. Catolikka 4. Protestanta 5. Mulanne( cakisse)_____	
104	Gichchi	1. Hadiyya 2. Kambeta 3. Gurage'e 4. Amhera 5. Mulanne(cakisse)___	
105	Amaki losani gabali	1. Mahami loso'oyo 2. Luxxi gabala 3. Lami gabala, lobane	
106	Min amaki baxi	1. Adil baxanchote2. Gaqi baxanchote 3. Abullancho4. Dadaranchote	
107	Mini-anichiki Losanni gabali	1. Mahami losubee'anne 2. Luxxi gabala 3. Lami gabala, lobanne	
108	Min-anichiki baxi	1.Adil baxancho2. Gaqi baxancho 3. Abullancho 4. Dadarancho	
109	Kina hunikki yokko: A redo'i A TV Annani anianni kitabuwwa qannanacha xantohonnihe	1. Oyya 2. Aha'e 1. Oyya 2. Aha'e 1. Oyya 2. Aha'e	
110	Aganni sixxo'i gaballi hinkanna?	1. <=500 2. 501-1000 3. 1001-1500 4. 1501-2000 5. 2000&hannani 6. La'omoyyo	
111	Kinna mee'i ciilluwwi yokko?	_____ xigi	
112	Ciilich Alibachi	1. Goncho 2. Landichotte	
113	Ciilichi Umuri	_____ Aganna	

114	Qaranchi ogori/mee'anne?	_____th.	
115	Umulli annannati lobi ciillanne hoffi ciillanne	1.Mahimibee/ehannamme 2. _____hincho	
116	Amaki woroli sawitti qacalli ciilli bikkinna	1. Gottokicho 2. Likkancho 3. Lobanne/Gejja 4. La'umoyyo	
<b>Lammi II. Amakka fayya'omma mo'isso xammichuwwa</b>			
201	Fayya'omi egechi minnee lamiforri ikka mattahinihe kaciilichinna?	1. Oyya 2. Aha'e	Aha'e marre'e 205
202	Oyya yitilas mee'i kore mattito?	1. 1-2 kore 2. 3-4 kore 3. >4 kore 4. La'omoyyo	
203	Fayya'omi losano annuna icissimi bikinna sidahinihe?	1. Oyya 2. Aha'e	Aha'e marre'e 205
204	Hannonette kaa ciilla qattitokki?	1. Minnetette Hospitalannette 3. Xenna xaba'annette 4. Mulekki	2. Dabachi ihulasi marre'e 207
205	Qatti bagi hospital/xenna xaba'a ihulas inka'issinne qatitto?	1. Ladi orachinne 2. Opireshinninne	
206	Qarimmi ammanne ayyi haramotto issukko?	1. Hegeqi qassissanni/TBA 2. Fayya'omma harassimi baxanni/HEW 3. Fayya'ommi lachi mani/Hakkimuwwi 4. Qarimmani 5. Mulekki (cakkisha)_____	
207	Qatta lassage annunna iccissi awwaxi bikkinna losanno sidahinnihe?	1. Oyya 2. Aha'e	
<b>Saxxi III. Annunna iccissimma, hassisso hurbatta uwwimi halato'o</b>			
301	Hundi ammannemi annunna iccissohonnihe(8-12) kori affebe'e?	1. Oyya 2. Aha'e	Oyya marre'e 303
302	Qatta lasage hinkanni amannina ciilicho annunanne disitoto/	1. 1 sa'atinna 2. 1- 24 sa'atinna. 3. 1-3 ballinna 4. >3 ballinna	
303	Annunna uwwimi gasitta huribaata/aga'a uwitohonihe?	1. Oyya 2. Aha'e	Aha'e marre'e 307
304	Oyya yitilas, marucho uwito'o issenna/ixxenna?	1. Burro'o 2. Sukkara wo'o 3. Soqido'o wo'o 4. Laalewwi addo'o 5. Wo'o xale'e 6. Mulekki (cakkisha)	

305	Luxxi annunni addo'o gosha hottohonnihe?	1. Oyya 2. Aha'e	Aha'e marre'e 309
306	Mahinnate ciilinna luxxi addo'o iccisso bee'kki?	1. Jori ihhu bikkinna 2. Cilikka godabo xississo bikkinna 3. Mulekki (cakkisha)_____	
307	Bee'eballa ciilli balla/himmo'o annunna icahinnihe?	1. Oyya 2. Aha'e	Aha'e marre'e 315
308	24 sa'atanne mee'ikore iccissotto?	_____ kore	
309	24 sa'axxi woronne huribaata/aga'a uwwitahinnihe?	1. Oyya 2. Aha'e	Aha'e marre'e 314
310	Hinkammanne annunna iccissotokki?	1. Ciilli hawwisso ammanne 2. Ciilli laro'o ammanne 3. Programminne 4. Maku sa'atanne	
311	Hinkanni umurannete ciillich annunna urokokki?	Uroyyo'o _____agannannette	
312	Ciilli qaramukkisami annunni hanenne dissimmi hassiso'issa kurakkatenne?	1.Oyya 2. Aha'e 3. La'ummoyyo'o	
313	Hundi amannemi annunna iccissohonihe?	1.Oyya      2. Aha'e 3. La'ummoyyo'o	
314	Annunnisse'e mulli hurbaata uwwakkami umura laqo'o?	1. <6 agannanne 2. 6 agannanne	
315	Annunnissi mulli hurbaata (6-9) aganni woronne ashesissohonihe?	1.Oyya      2. Aha'e 3. La'ummoyyo'o	
316	Summa kutto'o? cilli itukki hurbaaxekka beeballa ballanne/himmonne uwwitokka/ittukkokka'a?	1. Oyya 2. Aha'e 3. La'ummoyyo'o	
317	Mee'i kore'e uwwitito'o/ittukko'o xalla'e hurbaata	_____kore'e La'ummoyyo'o	
318	Ciilli ago'o luwwa beeballa balla'anne/himmonne uwitta'a?	1.Oyya      2. Aha'e 3. La'ummoyyo'o	
319	Mee'i ammanne agissito'o?	1. Mati koche'e      2. 2-3 kore'e 3. 3-4 kore'e      4. 4+ kore'e	
320	Hoffi hoffokkami hurbaaxi ichchi ammanninse haxonne ciillina hurbaata uwito'o?	1. Oyya 2. Aha'e	

321	Qacalli ciilluwwi bikkinna laqo'oluwwi yohonnihe?	1. Oyya 2. Aha'e	
322	Hanni sidito'o losanno/informationa	1.Hakkimuwwise'e 2. Fayya'omma harassimi baxxanisse'e/HEWs 3. Televisionisse'e 4. Rado'isse 5. Mulekki (cakkisha)_____	
323	Hinki hurbaata ciillinna duti ammanne uwwito'o? 1. Kashari lugumo'o 2. Attara'a/baqella/boqolla/ 3. Addo'o/buro'o/sallallo'o 4. Karotta'a & dubikasha'a 5. Mulli misha'a & muza'a 6. Maara'a 7. Qunqa'a	1. Oyya 2. Aha'e	
<b>Soilli 4 –Hassisokki luwwi xammicha'a Qacalli ciilluwwa'a haramokki manni xammicha'a</b>			
401	Ciillinna annunna iccissotti ammanne lophakka ayyi gallaxokko/haramokko?	1. Ciilli anni 2. Ciilli ammaa 3. Ballo'o 4. Fayya'ommi egeranni/HEWs 5. Iyyimmi gallaxoyo'o 6. Mulekki (cakkisha)_____	
402	Annunna iccissimmi bikkinna qoxxisukkokki/sogukkoki ayyette?	1. Ciilli anni      2. Ciilli ammaa 3. Ballo'o      4. HEWs 5. Beshuwwi 6. Mulekki (cakkisha)_____	
403	Kinna ayyette makkissukkokki attoratonna qacaalli ciilluwwi bikkinna	1. Beshuwwi      2. Ciilli ammaa 3. Ballo'o      4. HEWs 5. Mulekki (cakkisha)_____	
404	Qacalli ciilluwwi ammadimmi bikkinnakesse'e harammukkokki ayyette?	1. Ammo'i wixxitti2. Ciilli ammaa 3. Ballo'o      4. Olla'i manni 5. Xalloxxi minni manna 6. Mulekki	
405	Kinna hundi ammanemi xammichi he'oo qacalli ciilluwwi bikkinna?	1. Oyya , yitilas 411 2. Aha'e	

406	Kinna ayyi danami/hassissokki dabacha'a uwwakka liransokko'o?	1. Olla'i manni 2. Ballo'o 3. Ciilli ammaa 4. HEWs 5. Mulekki (cakkisha)_____	
407	Agimminna wo'o hanni sido'o?	1. Bu'issi 2. Barissi 3. Xennissi 4. Bombissi 5. Tubo'issi 6. Dajissi 7. Mulekki (cakkisha)_____	
408	Qacalli ciillinna uwwiminssi gassitta'a wo'o issito'ossi yohonnihe?	1. Oyya , yitilas 403 2. Aha'e	
409	Qacalli ciillinna aggo'okki wo'o maha'a issitta'a uwwito'o?	1. Huffa'a lassage sigissa uwwommo'o 2. Axxara'a uwwommo'o 3. Chlorinna eddaa lasage'e 4. Wixxa'a dissa lasage 5. Mulekki (cakkisha)_____	
410	Qacalli ciillinna itisakkamibee'issa issokkimashikka'i maha?	1. Qacalli ciilluwwa aboyyimi bikkinna laa'omoyo'o 2. Fayya'ommi minni qella 3. Sannitibi beecha'a 4. Manni yokki yanni 5. Minnenne yokki luwwa awwaxxonna hassimi/yimmi 6. Minnene ciillibikkinna haramokki manni bechi 7. Ciilli ittokki bee'e bikkinna 8. Mulekki (cakkisha)_____	
411	Ciilli xissukkita'anni hinkanni sa'ata minnise qellokko'o fayya'omi egechi mini affebe'e?	1. <30 daqiqa'a 2. 1 sa'ata. 3. 1-3 sa'ata. 4. 4-5 sa'ata 5. > 6 sa'ata	
<b>Hassissokki maraja'a/losanno Qacalli ciilluwwinna</b>			
412	Hundi ammannemi qacalli ciilluwwi bikkinnalosanno sido'o?	1. Oyya , yitilas 413 2. Aha'e	
413	Losanno sidotti bagi hannissette?	1. Radio, TV 2. Maxaffuwwi 3. Internetti 4. Magazinnissi 5. Fayya'ommi egeranni/HEWs 6. Mulekki (cakkisha)_____	
414	Hunnikki losanni lophakka kinna awwadokko?	1. Annunna iccissimi ammanni bikkinna 2. Hundi ammannemi balla'a/himmo'o	



		iccissimmi bikkinna 3. Ogorammi'ssinne annunna uwwimmi bikkinna. 4. Annunni edakka'a mulli hurbaata uwwimi bikkinna 5. Mulekki (cakkisha)_____	
415	Hunkki harammaxxi gogi lopa'a qacalli ciilluwwinna ellokko'o yita'a sawwitto'o?	1. Ammo'i wixxitti 2. Mati-mati ihhiminne 3. Fayya'ommi egechchi minni kollinne 4. Hegeqi minnadaphi kollinne 5. 1-5 mati ihhiminne 7. Silikkinne 8. Internetinne	
416	Annunna iccissimi bikkinna odimmi lohhi aganni lasage mulli hurbaatimi hassisso'issa lophakka ayyi harammokko?	1. Ciilli ammaa      2. Ballo'o 3. Ciilli anni      4. Beshuwwi 5. HEWs      6. Muleki_____	
417	Kabadi affebe'emmi annunna iccissollanihe?	1. Oyya , yitilas 418. 2. Aha'e	
418	Annunna iccissimma ullissimmikki mashikka'i marucho'o?	1. Annunanne addi bechcha 2. Ciilli larakka hawwissimma'a 3. Annunni xissimma'a 4. Beshuwwi sogittano'o 5. Mulekki (cakkisha)_____	

<b>Qaxxi-5. Ammo'ikka lachcha keennimi xammichcha</b>		
501	Qacalli ciilli luxxi hurbaati maha yitta sawwitotto'o?	1. Wo'o2. Gulukkossa 3. Annunni addo'o4. Gudukki addo'o 5. Qarare'e6. Mulekki(cakkisha)____ 7. La'ummoyyo'o
502	Qacalli ciilli qaramukki hinkanni sa'axxi lasage annunna iccokko'o?	Sa'ati_____ La'ummoyyo'o
503	Ciilli qaramukkissami luxxi addo'o maa'issitotto?	1. Ciillinna uwwommo2. Gosha horommo'o 3. Mulekki(cakkisha)_ 4. La'ummoyyo'o
504	Qacalli ciilli wo'o agimma mee'i aganni lasage asherokko?	1. Aganni_____ 2. La'ummoyyo'o
505	Annunni addi'i xalle'e mee'e aganninna massokko?	1. Aganni_____ 2. La'ummoyyo'o\
506	Annunni addo'o muli hurbaati maqiremme mee'e aganni/hinch affebe'e uwwitotto?	1. Aganni_____ 2. La'ummoyyo'o
507	Annunni axxi awwadi hinkanne yitta sawwitotto?	1. Hanqo'i hurbaata ciillinna 2. Ciilla jabbi egerokko/horokko 3. Ammakka ciillikka mateyyomma eddokko 4. Mulekki(cakkisha)_____ 5. Mahammi awwadoyyo 6. La'ummoyyo'o
508	Annunna iccissimmi kinna uwwokki awwaddi hinkka labo'o	1. Qalalli ihukki bikkinna 2. Qellisanssakka'a qarrimminna 3. Ammakka ciillikka mateyyomma eddokko 4. Bitta'akkammi bee'e bikkinna 5. Gurrato'o dilissimminna 6. Mulekki(cakkisha)_____ 7. Mahammi awwadoyyo 8. La'ummoyyo'o
509	Qacalli ciilli qaccaalli hurbaata hinkanni agannanne asherokko'o?	1. Aganni_____ 2. La'ummoyyo'o

**Ammo'ikka hallaxxi xammichcha qaccalli cilluwwa annunna iccissimmi bikkina**

Xig	Xammichcha	HI	Iyo	L	Imo	AI
		1	2	3	4	5
1	Qaccalli ciilla iccissomokki igaqi hasanninette					
2	Qaccalli ciilla iccissomokki muli qachchi afuro bee'issinnate					
3	Iccssomokki muli uwwommi luwwi bee'e bikkinatte					
4	Annunne addi hofte'utannimi iccissimma uromoyyo'o					
5	Annunna iccissimma hayyomoyyo araqi sa'atta gullokki bikkinna					
6	Annunna iccissimi ellokki bikkinna					
7	Waa'i qoccukkokki iccissakonatti ihukki bikkinna					
8	6hi aganni lasage iccissimmi hassisoyyo					
9	Annunna iccissimmi badissokkokki amma'a wicissokki bikkinna					
10	Annunne hagarra qayarokki bikkinna					
11	Annunni mahissemmi lobanne					
12	Minni manni harammatti iccissimma ittomisinna issakko'o					
13	Iccissimmi woga'a/ bahilla ihukki bikkinna					
14	Abbissi dolli kidi annunna iccissimmi hossukuyya warakko					
15	Annunna iccissimmi ciillikka ikka mateyyomma qoxisokko					
16	Annunna iccissimmi cilla'a fayya'a/qoxxalla/xalliga issokko					
17	Annunna iccissimmi kemmalla					
18	Annunna iccissimmi horemme mishisokki wossa'a					

**Key:**

**HI**-Horiyyemmi ittamomoyyo'o

**Imo**-Ittamommo

**Iyo**-Ittamomoyyo'o

**AI**-Araqa ittamommo

**L**-La'ummoyyo'o

**5.2. Ammo'ikka hallaxxi xammichcha qaccalli cilluwwinna 6hi agani lasage hurbaata uwwimmi bikkinna**

Xigo	Xamichcha	HI1	Iyo 2	L 3	Imo 4	AI 5
1	Ciilla'a fullisokko'o					
2	Santibi/birr yokki bikkinna hurbaata bita'a uwwomo annunnisi haxxanne					
3	Annunni addi ihokki bee'e bikkinna qaramma hoffi qaxxi aganni lasage muli hurbaata eddimma itommo'o					
4	Muli manni/abarossi hasisokki hurbaata uwwomissina haramokko					
5	Annunna iccissimmi wiccisokki bikkinna muli hurbaata uwwimma ittommo'o					
6	Annunnisi muli hurbaata uwwimmi fayya'a/qoxalli ciilla'a issokko'o					
7	6hi aganni lasage annunnisi haxonne muli hurbaata uwwimmi horiyyemi dannammo'o					

**Key:HI**-Horiyyemmi ittamomoyyo'o

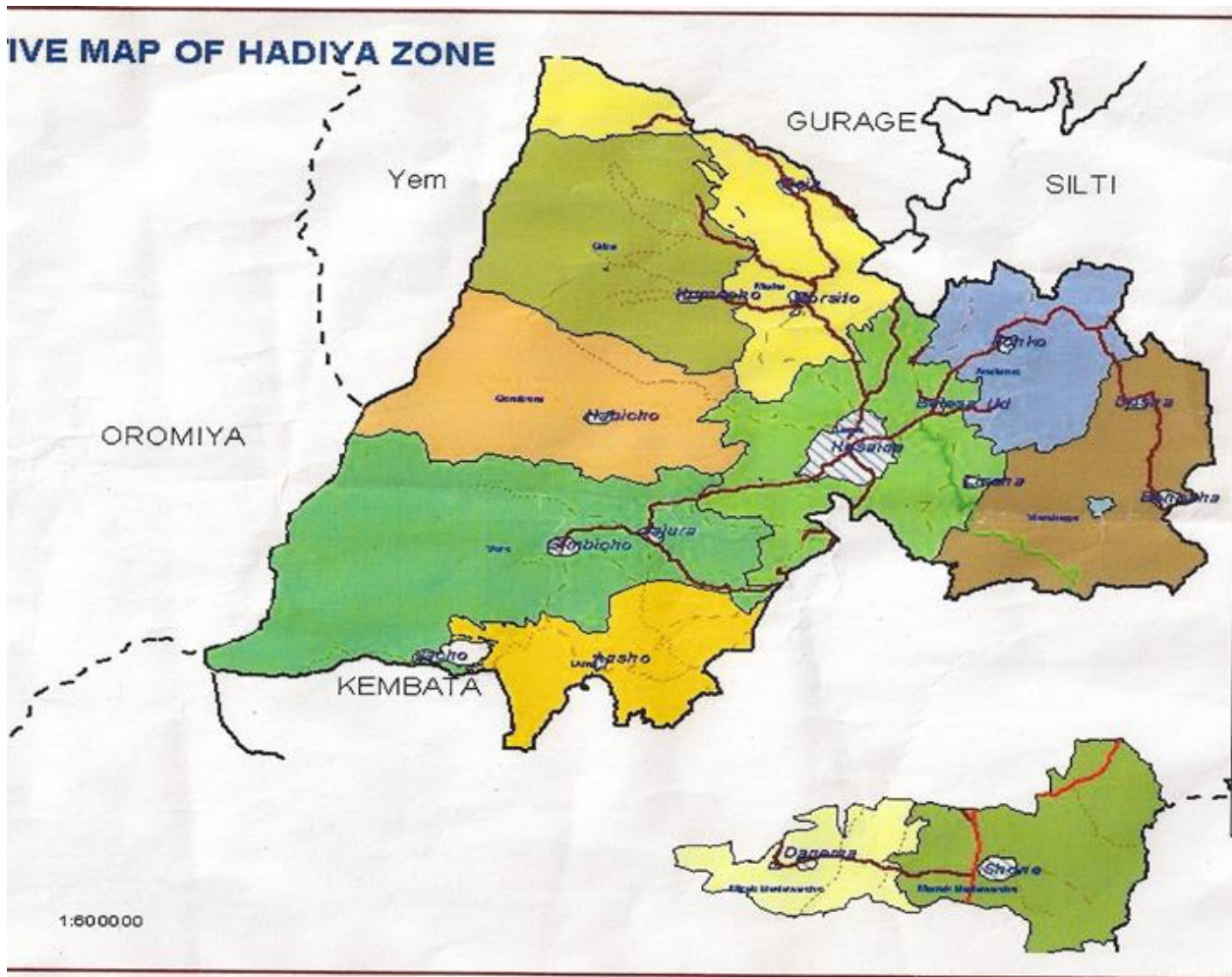
**Iyo**-Ittamomoyyo'o

**L**-La'ummoyyo'o

**Imo**-Ittamommo

**AI**-Araqa ittamommo

Figure 7. Map of Hadiya Zone



**ASSURANCE OF PRINCIPAL INVESTIGATOR**

The undersigned agrees to accept responsibility for the scientific ethical and technical conduct of the research project and for provision of required progress reports as per terms and conditions of the Faculty of Public Health in effect at the time of grant is forwarded as the result of this application.

Name of the student: \_\_\_\_\_

Date. \_\_\_\_\_ Signature \_\_\_\_\_

**APPROVAL OF THE FIRST ADVISOR**

Name of the first advisor: \_\_\_\_\_

Date. \_\_\_\_\_ Signature \_\_\_\_\_

**APPROVAL OF THE SECOND ADVISOR**

Name of the first advisor: \_\_\_\_\_

Date. \_\_\_\_\_ Signature \_\_\_\_\_