

**IMPACT OF HOUSEHOLD HEADS' ALCOHOL CONSUMPTION ON
THE NUTRITIONAL STATUS OF CHILDREN UNDER FIVE YEARS OF
AGE IN OL'LESSOS DIVISION, NANDI DISTRICT, KENYA**

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DECLARATION

I, JELIMO SAINA, hereby declare that this dissertation is my original work and to the best of my knowledge it has not been presented for the award of a degree in any other University.

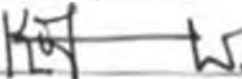
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DEDICATION

This work is dedicated to my dear husband Dan Nyamwega for his support and continuous encouragement through the study period. To our children: James, Grace and Joe for their encouragement and support. To my parents Samson and Elizabeth Saina for laying a good foundation that enabled me to further my studies.

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ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
CBS	Central Bureau of Statistics
CI	Confidence Interval
CU	Consumer Unit
CoA	Children of Alcoholics
EPI	Expanded Program on Immunization
FA	Field Assistant
FAO	Food and Agriculture Organization of the United Nations
FGD	Focused Group Discussion
GAM	Global Acute Malnutrition
GOK	Government of Kenya
HES	Household Economic Status
HFA	Height-for-Age
HH	Household
HHH	Household Head
IYCF	Infant and Young Child Food
KDHS	Kenya Demographic Health Survey
MUAC	Middle Upper Arm Circumference
MPND	Ministry of Planning and National Development
NDDP	Nandi District Development Plan
NGOs	Non Governmental Organization
NCHS	National Centre for Health Statistics
NACADA	National Agency for the Campaign Against Drug Abuse

P-Value	Probability Value (Level of Significance)
PEM	Protein Energy Malnutrition
RHHH	Relationship to Household Head
RDA	Recommended Dietary Allowance
SD	Standard Deviation
SPSS	Statistical Package for Social Scientists
UNODC	United Nations Office on Drugs and Crime
UNICEF	United National Children Emergency Fund
WFA	Weight-For-Age
WFH	Weight-For-Height
WHO	World Health Organization

OPERATIONAL DEFINITIONS

Acute Malnutrition: The result of a recent failure to receive adequate nutrition and may be caused by acute illness, especially diarrhoea.

Alcohol: It is an end product of energy metabolism of sugars by yeasts under anaerobic conditions. When ingested by humans, it is intoxicating with severe health consequences when consumed in excess or abused.

Alcoholic Households: In this study it refers to those household units where the caregivers or household head was consuming alcohol.

Alcohol Abuse: In this study Alcohol Abuse means somebody consuming one litre and above of alcohol at least 3 days or more in a week. It has morbidity impact effect where one experiences loss of control and begins to suffer from health, social and occupational effects (NACADA, 2006).

Child Care Giver: Refers to any person providing care to the child.

Chronic Malnutrition: The result of an inadequate intake of food over a long period and may be exacerbated by chronic illness manifested by stunting.

Diarrhoea: Refers to the passage of three or more loose or watery stool in 24 hours period.

Dietary Diversity: Is the sum of the number of the different foods or food groups consumed by an individual or household over a specific time period.

Focus Group Discussion: A non-randomly selected group of people brought together to discuss and explore a limited number of defined topics.

Household: All the people living under the same roof (including extended families, servants, visitors) for a minimum of three months and who eat from the same pot and share livelihood sources, and provide services for household livelihood.

Livelihood A level of wealth and of stocks and flow of food and cash which provide for physical and social well-being and security against becoming poorer.

Malnutrition: The state of nutrition where the height- for- age, weight-for-age and weight- for- height indices fall below -2z scores of the national centre for health statistics (NCHS) reference.

Malnutrition may be acute or chronic.

Stunting: Is a condition where height-for-age has Z-score of -2 standard deviations (SD) below the NCHS/CDC WHO International Reference Population

Wasting: A wasted child has a weight-for-height Z-score that is -2 SD below the NCHS/CDC WHO International Reference Population.

Underweight: This refers to low body weight relative to age.

Underweight Child Has a weight-for-age below -2 standard deviations (or -2 z-scores) of the median value of the NCHS/CDC WHO International Growth Reference for weight-for-age.

ABSTRACT

There are many causes of malnutrition. Drugs and substance abuse, a serious global problem with adverse effects on national securities and socio-economic development is a major contributing factor to malnutrition. Using a descriptive cross-sectional research design, this study investigated the impact of household heads' alcohol consumption on the nutritional status of children under five years of age in Ol'lessos Division, Nandi District, Kenya. The specific objectives included, establishing the demographic and socio-economic status of households, determining the level of consumption of alcohol among households, the nutritional status, dietary diversity, morbidity, and the relationship between alcohol consumption and the nutritional status of children under five years of age in households in Ol'lessos Division. Data were collected using a structured questionnaire and focus group discussion.

A total of 170 households involving 876 persons were studied. Of these, slightly more than half were women. Forty nine per cent were male, 51.3% female and 25.7% children under five years of age. About 50 percent (100) boys and 49.7% (99) girls fitted the study. The mean household size was 5.2 members. A high percentage of non-alcoholic households (53.2%) were married. Of alcohol consumers (47.1%) were married, (18.8%) were single and others (75%) widowed. Out of 170 household heads, there were 82.9% male-headed and 17.1% female-headed households. Alcoholic households had the highest percentage (36.5%) of non-educated household heads compared to 16.3% of non-alcoholic households. This justifies the levels of malnutrition that is caused by illiteracy levels among households. Fifty three point one percent (53.1%) of alcoholic households had temporary houses (thatched roof, mud walls and mud floor) as compared to 46.9% of non-alcoholic households. In temporary households 4.2% of children were severely malnourished and 9.6% moderately malnourished, while in the permanent

households only 0.6% were severely malnourished and 2.4% were moderately malnourished [$\chi^2=0.002$: $p<0.05$]. This brings in poverty as a confounding factor to malnutrition of children under five years of age. In land ownership 78.4% households had less than three acres. Malnutrition levels were highest (33.3%) in households with no land and 14.4% in households with land [$\chi^2=0.030$: $p<0.05$]. Main source of income in households was farming (64.1%). Households that earned a salary had the highest percentage of alcoholics (53.3%), while (50.5%) farming and the rest (41.9%) were practising business.

More than 75% male headed and 25% women headed households consumed alcohol [$\chi^2=0.020$: $p<0.05$]. Many of the consumers (41.7%) drank in the evenings. Households that consumed 3 litres of alcohol had the highest number of malnourished children though tests performed showed no statistical difference. There was no correlation between amount of alcohol used and children's nutritional status. A high percentage (38.1%) of children from alcohol consuming households were underweight, 26.3% stunted and 14.3% underweight compared to children from non-alcohol consuming households. The relationship between alcohol consumption and food diversity was statistically significant [$\chi^2=0.012$: $p<0.05$]. About 55.1% of children from alcohol consuming households were ill within two weeks prior to the research study as compared to 44.9% of non-alcoholic households [$\chi^2=0.045$: $p<0.055$].

From the study the relationship between alcohol consumption and food diversity of children in households' in Ol'lessos Division was established. Recommendations made include: establish the factors behind high level of alcohol consumption (alcohol abuse), health workers should educate the community on the importance of various food groups and that government, research institutions, non-governmental organizations and public and the private sector should put their resources together replicate the present study with larger sample sizes in the same or

different area using stratification method of sampling.

CHAPTER 1: INTRODUCTION

1.0 Background

The Food and Agricultural Organization (FAO) indicates that world population continues to increase at an alarming rate of 85 million per year (FAO, 2001). Unfortunately also, millions of people across the world suffer from malnutrition (Gupta, et al, 2007; Hong, 2006; UNICEF, 2006). There are many causes of malnutrition. Alcohol and drug and substance abuse are some of the causes of malnutrition and are serious global problems with adverse effects on national securities and socio-economic development (UNODC, 2008).

Studies by the National Agency for Campaign Against Drug Abuse (NACADA) indicate that drug abuse in Kenya has permeated all strata of society than previously appreciated (NACADA, 2004 and 2007). Marketing strategies, particularly in the areas of advertising, sponsorship and production of new drinks, appear targeted to attract young people to alcoholic beverages. The beverage industry is highly innovative; coupled with new product development, a vital factor in its profitability. There is also a huge explosion of disposable income, especially among the youth, and an increase in social drinking (Rutherford, 2009). Today's users are looking for products that are aligned with global trends. Youngsters seeking western lifestyles typically begin by drinking beer and move into spirits. Brand positioning is designed to attract these upwardly mobile and inspirational customers (Rutherford, 2009). Special case for Kenya relate to illicit traditional drinks and cannabis which are rampant despite low income among users in rural areas such as Ol'lessos in Nandi district.

The widespread use of alcoholic beverages is associated with a range of health and social problems including road traffic fatalities, industrial and domestic accidents, suicides, sports and leisure injuries, violence and reduced productivity in the workplace (NACADA, 2009:

Rutherford, 2009). Alcohol is an addictive drug with a tendency of physiological effects on the user. Repeated high volume consumption of a drug leads to reduced sensitivity effect (tolerance). Once addicted, reduction in consumption is accompanied by recognized withdrawal syndrome, while a proportion of all individuals who consume alcohol become permanent dependants on it (NACADA, 2009).

Alcohol dependence and use becomes harmful when it affects the user and third parties (Rutherford, 2009). Alcohol abuse is when one drinks excessively and becomes violent and injurious to themselves and others. When such a person fails to fulfil their responsibilities and obligations (e.g., to themselves, their family and their employer) then alcohol is considered seriously as counterproductive. Alcohol abuse or alcoholism compromises the health, safety and security of the individual and other people they interact with, and generally has a negative effect on the family and society (NACADA, 2009). Such outcomes from alcohol abuse by the users in the household are likely to have grave consequences on other members of the household, who depend on alcohol abusers for their livelihood.

Previous research is replete with information on the effect of alcohol on abusers. From a rights-based programming vantage-point, it is highly probable that many alcohol abusers are not only malnourished, but are also most likely to abdicate their responsibilities as caregivers and to provide for their families' nutritional needs. Needless to state, alcohol abuse is a very expensive affair, in financial terms. Finances are more likely to be diverted to satiating the craving for alcohol than to purchasing food and other basic necessities. In other words, it is necessary and not just sufficient, to worry about an alcohol abuser without due consideration for his or her family and other third parties (Rutherford, 2009), particularly children under five years of age.

Nutritional status of young children, and the attendant issues of infant and child mortality

and morbidity, is a sensitive indicator of changes in the health status and food availability (MPND, 2002-2008). It is a useful tool as an early warning of distress and ill health within the population. It gives the current status of children in terms of immediate (acute) determinants of malnutrition, such as inadequate current intake of food, childhood diseases and diarrhoea, which lead to wasting, while the accumulated impact of chronic deprivation leads to stunting.

1.1 Statement of the Research Problem

Few studies however have included investigations on effect of alcoholism on the nutritional status of the abuser and dependents. Specifically there is not much literature on effect of alcohol on the alcohol abuser's children. Therefore there is a dearth of information on the role of alcohol consumption in household as a potential determinant of malnutrition in the dependants of household heads who abuse alcohol. This study thus concerned itself with determining the impact of alcohol consumption by household heads on the nutritional status of children under five years (See Fig 1).

1.2 Justification of the Study

Researching the nutritional status of children seems a logical starting point in efforts aimed at minimizing alcohol abuse and raising health standards of a country's populace. Alcohol consumption greatly affects the consumer and, more importantly perhaps, the dependants. Passive drinking (Rutherford, 2009) refers to the consumption of alcohol, which causes harm to people other than the drinkers themselves. The government of Kenya has been trying to curb the problem; however, more needs to be done, hence the present study.

Alcohol abuse tendencies are in general strongly associated with hopelessness and poverty in a society. Alcohol-related mortality is often highest among the poor in society (Rutherford, 2009). Research is, therefore, necessary to elevate the visibility of alcohol issues

among the hierarchy of public health and non-communicable disease issues burdening humankind (Rutherford, 2009). The present study contributes towards this goal by focusing on the impact of alcohol on the nutritional status of abusers' dependents: namely children under five years of age, at a critical stage of their growth and development. Results from this study shall widen the malnutrition intervention knowledge base in Ol'lessos Division, Nandi District and Kenya in general. Additionally, the study has made some contribution towards the Global Strategy to Reduce Harmful use of Alcohol (Rutherford, 2009) aimed at protecting at-risk populations, young people and those affected by the harmful drinking of others

1.3 Aim of the Study

The aim of this study was to establish the relationship between alcohol consumption and nutritional status of children in households in Ol'lessos Division, Nandi District and help illuminate on mitigation strategies for reversing child malnutrition attributed to alcoholism in Kenya.

Alcohol Consumption Conceptual Framework

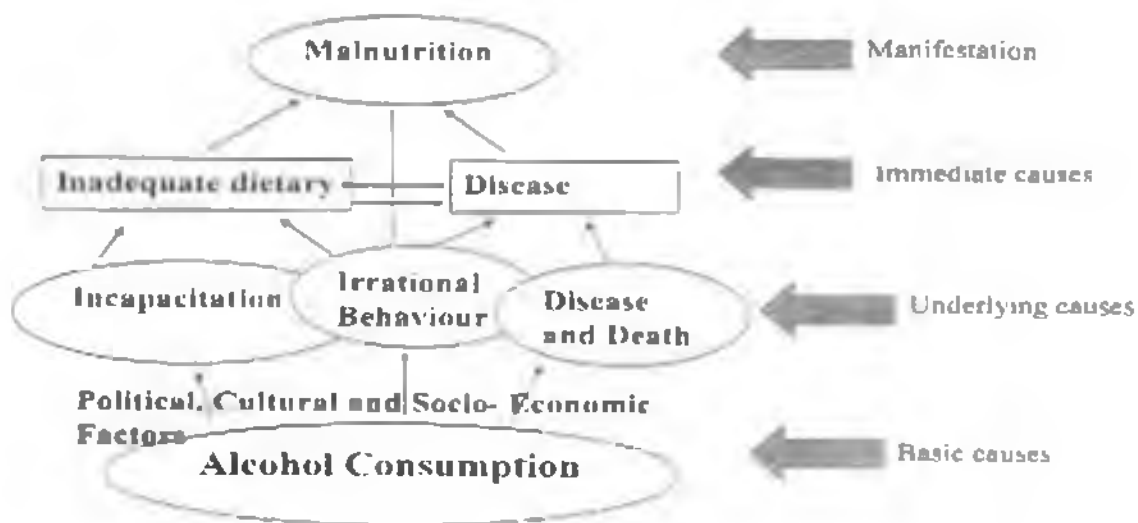


Figure 1: Alcohol Consumption and Malnutrition Conceptual Framework

Source. Adapted from UNICEF 1998.

1.4 Purpose of the Study

The purpose of this study was to establish the role of alcohol consumption on the nutritional status of children in Ol'lessos Division, Nandi District

1.5 General Objective

The general objective of this study was to assess the impact of alcohol consumption by household heads on nutritional status of children in Ol'lessos Division, Nandi District, Kenya.

1.5.1 Specific Objectives

The specific objectives of this study were to:

- Determine the nutritional status of children under five years of age in households in

Ol'lessos Division.

- Determine dietary diversity among children under five years of age in households in Ol'lessos Division.
- Determine morbidity among children under five years of age in households in Ol'lessos Division.
- Determine the level of alcohol consumption among household heads in Ol'lessos Division.
- Determine the relationship between alcohol consumption by HHH and dietary diversity and also the nutritional status of children under five years of age in households in Ol'lessos Division
- Describe the demographic and socio-economic status of households in Ol'lessos Division.

1.6 Hypotheses

The following were the hypotheses for this study:

- There is no difference in the nutritional status of children under five years of age due to alcohol consumption by key duty bearers in Ol'lessos Division
- There is no difference in dietary diversity among children under five years of age due to alcohol consumption by key duty bearers in Ol'lessos Division.
- There is no relationship between level of alcohol consumption by key duty bearers and the nutritional status of children under five years of age in Ol'lessos Division.

1.7 Research Questions

This study answered the following questions:

- What is the level of alcohol consumption among households in Ol'lessos Division?

- What is the nutritional status of children under five years of age in households in Ol'lessos Division?
- What is the dietary diversity in households where the head was an alcohol user in Ol'lessos Division?
- What is the morbidity rate for children under five years of age in households in Ol'lessos Division?
- Is there a relationship between alcohol consumption by key household duty bearers and the nutritional status of children under five years of age in households in Ol'lessos Division?

1.8 Limitations of the Study

Inquiring into the harmful consequences of the misuse of alcohol is not an easy task given the complex nature of the issues surrounding alcohol (Rutherford, 2009). The greatest limitation of this study was in the unwillingness of some of the respondents to give information freely and without fear of being seen in negative light. Some even ran into the maize plantations when they saw our car arriving, thinking we were policemen coming to arrest them! The researcher used method triangulation (to compare data across data collection sources) to corroborate information shared by respondents.

Another limitation was related to some respondents being too drunk to participate. The researcher simply re-scheduled the data collection with such respondents (i.e., by visiting them early in the morning).

1.9 Expected General Outcomes of the Study

The expected general outcomes of the study were:

- The nutritional status of children under five years of age in households in Ol'lessos

Division determined.

- Dietary diversity among children under five years of age in households in Ol'lessos

Division determined.

- Morbidity among children under five years of age in households in Ol'lessos Division determined.

- Level of alcohol consumption among households in Ol'lessos Division determined.

- Relationship between level of alcohol consumption by key household duty bearers and the nutritional status of children under five years of age in households in Ol'lessos Division determined.

- Demographic and socio-economic status of households in Ol'lessos Division determined.

CHAPTER 2: LITERATURE REVIEW

2.0 Overview of Malnutrition

Childhood malnutrition is a major public health concern in developing countries, with over 200 million children under the age of five years being malnourished. Of the nearly 12 million children under five years who die each year in developing countries, over 6 million are either directly or indirectly attributed to malnutrition (Gupta, et al, 2007; UNICEF 1998). Kenya is among six African countries where five million children below the age of five years are suffering from malnutrition (Koross, 2009). UNICEF estimated that for the whole of 2009 some 500,000 children under five would suffer from life-threatening severe acute malnutrition. What is worse a report, (CBS 2009), says that many Kenyan children suffer from effects of malnutrition – a condition that impairs physical and mental development (Kigotho, 2009). According to the report, there are links between long-term effects of health and nutrition in early childhood and educational outcomes. Kigotho cites Lewin who says many children less than five years of age in Sub-Saharan Africa fail to reach their potential in cognitive development because of poverty, poor health and nutrition and deficient care. Such children, when they eventually grow up, will have low incomes, high fertility and provide poor care for their children leading to intergenerational transmission of poverty. Both malnutrition and mortality take a tremendous toll on young children. Malnutrition compromises child health, making children susceptible to illness and death. Infectious diseases, such as acute respiratory infections, diarrhoea, and malaria account for the greatest proportion of infant and under-five mortality.

Malnutrition is the outcome of diverse and interrelated factors, which may operate singly or in combination. Malnutrition may be as a result of immediate and underlying causes. Inadequate dietary intake and disease are the immediate causes of malnutrition (UNICEF 1990).

Dietary inadequacies may be caused by factors such as meal frequency, amount of food per meal, energy and nutrient density of food, biological utilization and/or mothers' limited time to prepare food or feed their children. Disease may result from lack of or low utilization of health services, inadequate water supply and sanitary facilities and poor hygiene or inadequate child care (UNICEF 1990). Underlying causes of malnutrition include insufficient household food security and inadequate maternal and child health services, and unhealthy environment. Immediate and underlying causes of malnutrition are in turn caused by a combination of economic structures, political and ideological super structure as well as cultural beliefs (UNICEF 1990).

2.1 Methods and Techniques of Data Collection

2.1.1 Anthropometric Measurements

The nutritional status of a population can be assessed using the following indicators: Height-for-Age (HFA), Weight-for-Age (WFA) and Weight-for-Height (WFH) according to the National Centre for Health Statistics (NCHS) reference value taking minus 2 standard deviations (-2SD) as the cut off point. The nutritional status is reported as z-scores rather than as percentages of the reference median or percentiles. Generally a z-score above -2SD is considered to indicate a state of adequate nutrition while that below -2SD indicates an adequate nutritional state.

Stunting is the relationship of observed height to expected height for a specific age and sex. HFA reflects deficits in linear growth and hence the nutritional history of an individual. It is interpreted as indicator of past nutritional adequacy, with a low HFA indicating chronic malnutrition which may have resulted from inadequate dietary intake over a long period of time. A child below -2SD from the median is considered too short for his/her age or stunted, reflecting

the cumulative effect of chronic malnutrition. This occurs especially during the first two years of life when growth is most rapid. Although improved diet may result in the increase in height some permanent retardation may occur if the period of deprivation is prolonged.

Underweight – or Weight-for-Age, is the relationship of observed weight to expected weight for a specific age and sex but does not distinguish between present and long term malnutrition. It gives a mixed reflection on both stunting and wasting (i.e., it generally measures the degree of underweight and is thus a useful measure of nutritional progress in a community). If the child is found to be underweight, the cause can include chronic or acute malnutrition, among other causes (WHO, 1995).

2.1.2 Household Dietary Diversity

In this study Household Dietary Diversity Score was used to reflect, in a snapshot form, the ability of the study households to consume a variety of foods. Dietary Diversity scores are created by summing up food groups consumed over a reference period. They give a valid picture of the Dietary Diversity at the community level only. Scores to capture Diet Diversity still need further standardization to be used at the global level (Swindale & Blinsky, 2006).

2.2 Determinants of Malnutrition

Determinants of malnutrition are multi-factorial and include factors such as general socio-economic status, dietary intake, sources of drinking water and mother's education. Hong (2006) examined the association between economic inequality and chronic childhood under-nutrition among children in Ghana. A total of 3077 children aged 0–59 months from a nationally representative sample of 6251 households were included in Hong's 2003 Ghana Demographic and Health Survey. Bivariate and multivariate analyses were used to estimate the effects of household economic status (HES) on stunting. The findings indicated that children in the poorest

20% of households are more than twice as likely to suffer from stunting as children in the richest 20% of households. These are independent of the child's age, sex, birth order, breast-feeding duration, birth weight; mother's age at childbirth, body mass index, education; and household access to safe drinking water, hygienic toilet facilities, residence and geographic region (odds ratio \approx 2.3; 95% confidence interval 1.4–3.7). Also children in the next poorest and in the middle quintiles were significantly more likely to be chronically undernourished compared to children in the richest 20% of households. Hong (2006) concluded that economic inequality is strongly associated with chronic childhood under-nutrition. He recommended that reducing economic inequalities and making services more accessible to the poor are critical to improving the health and nutritional status of children in Ghana

Khandare et al. (2001) conducted a rapid survey on nutritional status for 118 households in four villages in Thane district of Maharashtra India, through clinical examination, anthropometry, dietary intake and general socio-economic status. Data on food and nutrient intake indicated that rice was consumed as the major dietary staple in the region, followed by ragi (*Eleusine coracana*), wheat (*Triticum aestivum*) and bajra (*Pennisetum typhoides*). The daily average calorie intakes per consumption unit (CU) were observed to be 1857 kcal and 42g protein, which were less by 23, and 30% of RDA after calories and protein respectively. Data on prevalence of malnutrition among 0-6 years old children showed that about 69% were moderately underweight (<median -2SD), while about 29% were severely underweight (<median <-3SD). The overall prevalence for stunting (<Median-2SD) of children was 60.4% while those with severe stunting (<Median-3SD) were 38.5%. The prevalence for current nutritional status and wasting as indicated by Weight-for-Height was 30.2% and 4.4% respectively. The results of Khandare et al. (2001) rapid survey indicated that various factors including health status of

mothers, dietary and socio-economic factors were contributory to the malnutrition of the children. Underweight status was indicative of children who suffered from chronic or acute malnutrition or both, influenced by both short- and long-term determinants of malnutrition.

Gupta, et al (2007) conducted a cross-sectional study (over 374 children aged 6 -23 months in Senegal's' Podor Health District) with the objective of determining association between early introduction of water and complementary foods (CFs). Results indicated that water was introduced to about 85% of the children in the first 3 months of life, while 62% were fed CFs before 6 months. Overall, 16% of children had clinically significant wasting (Weight-for-Height Z-score (WHZ) less than 22) and 20% were stunted (Height-for-Age Z-score (HAZ) of less than 22). There was no significant association between wasting or stunting and introduction of water before 3 months. A significant association was found between wasting and male sex on one hand and age in drinking river/pond water and large family size. Stunting on the other hand was associated with age and drinking tap water. Results in Gupta, et al (2007) study suggested that early introduction of water and CFs was frequent but not associated with increased risk for malnutrition among children in the district.

A study conducted in Ethiopia in 2003 by Macro International Inc. (2008) compared children's nutritional status and variables such as mother's education, source of drinking water and feeding practices for children aged 0 – 59 months old. The study results indicated that maternal education had an inverse relationship with stunting and wasting in Ethiopia. Stunting was found to be twice as high, wasting more than five times and underweight three times as high among children of mothers with no education, when compared to children educated to secondary and higher levels. Among the households with children under five years, 57 percent had access to an improved water source, while 43 percent used water from non-improved sources. Children

whose drinking water was from a non-improved water source were more likely to be stunted than children with access to an improved water source. Levels of wasting and underweight did not vary significantly by water source. The introduction of liquids to infants namely: water, sugar, juice, formula, and solid foods took place earlier than the recommended age of six months. Twenty-three percent of breastfed children aged 6-23 months were fed with recommended dietary intake of all three Infant and Young Child Food (IYCF). Eleven percent of non-breastfed children aged 6-23 months were fed with all the three IYCF. Overall, 22 percent of children were fed according to the IYCF recommended practices.

Studies by Macro International Inc. (2008) on nine Sub-Saharan countries namely: Ethiopia, Rwanda, Chad, Kenya, Cameroon, Uganda, Tanzania, Eritrea and Democratic Republic of Congo, compared prevalence of stunting, wasting and underweight according to standards for infants and children developed by WHO in 1997. In the nine countries, the percentage of children under five years who were stunted ranged from 30 to 47 percent. The percentage of children under five years in the nine countries who were wasted ranged from 3 to 14 percent. Children under five years in the nine countries who were underweight ranged from 18 to 40 percent. Other findings from Macro International Inc. (2008) indicated that Kenya's infant mortality rate was 77 deaths per 1,000 births. This means that 7% of children born in Kenya die before their first birthday. This rate is one of the highest among Sub-Saharan African countries. In addition, the study indicated that Kenya's under-five mortality rate was 115 deaths per 1,000 births, implying that roughly 11 percent of children born in Kenya die before their fifth birthday. Again this rate is one of the highest among Sub-Saharan African countries

The Kenya Central Bureau of Statistics (CBS) conducted the fifth national nutritional survey in 1994 on child survival and child anthropometry for 10,857 households countrywide;

targeting children aged 6 to 60 months. The findings showed that overall, 34 per cent of the under fives in 1994 were moderately and severely stunted, while 8 per cent were wasted. The highest stunting levels were found in Eastern Province (38.5 per cent), followed by the Coast (38.3 per cent) and Nyanza (36.4 per cent). Malnutrition in under-fives was found to be strongly associated with morbidity patterns, female illiteracy, poor sanitation, unsafe water sources, household size and household food expenditure patterns.

Table 2.1 shows stunting and wasting rates in Nandi district, the selected study area

Table 2.1: Summary of Results on Stunting, Wasting and Underweight in Nandi District

	Height-for-Age		Weight-for-Height		Weight-for-Age		
	Below	Below	Below	Below	Below	Below	
	3SD	2SD	3SD	2SD	3SD	2SD	
Nandi	9.3	29.4	0.5	5.2	2.3	19.1	214
National	14.7	33.6	2.1	7.8	5.6	22.5	8,942

Of the 214 under five year old children who were measured in Nandi district in 1994, 29 per cent were moderately stunted while 9 per cent were severely stunted. Five per cent of these children were moderately wasted, while 1 per cent was severely wasted. Nineteen per cent of the target children were underweight for their age, while 2 per cent were severely underweight. The CBS (1994) survey concluded that malnutrition exists where the basic material needs are not adequately met. Such inadequacies can be precipitated by irrational allocation of resources as happens in cases of households headed by an alcohol consumer. Of interest was that female literacy was the most significant variable in controlling stunting levels in children.

In conclusion three studies of the six cited above (i.e., Khandare et al., (2008), Macro International Inc. (2008) and Gupta et al., (2007)) demonstrated dietary intake as an important variable in determining children's nutritional status. Two studies (i.e., Macro International Inc. (2008) and Gupta et al., (2007)) demonstrated effect of water quality on children's nutritional status. Three studies (i.e., CBS (1994); Khandare et al., (2008) and Macro International Inc. (2008)) demonstrated the significance of mother's health and education on nutritional status of children. Two studies (i.e., Hong (2006) and Khandare et al., (2008)) showed socio-economic variables as relevant determinants of nutritional status of children. The role of alcoholism has not been specifically dealt with in all these studies as a confounding determinant of nutritional status of children. These findings however confirm existence of stunting, wasting and underweight among Kenyan children that need to be addressed. The above studies are complemented by this study given its emphasis was on the effect of alcohol consumption on the nutritional status of children.

2.3 Overview of Alcohol (Ab) use

Alcohol is a chemical compound produced by fermentation of sugars using yeast (NACADA 2006). Such sugars are derived from grains, coconut, fruit juices, cane sugar, potatoes, and honey. Some of the alcoholic products that are consumed and which result from fermentation of the above sugar sources are: beer and wines, whisky and brandy, chang'aa, mnazi, busaa and muratina. The different types of alcoholic products contain different amounts of ethanol (e.g., beers 5% v/v wines 12% v/v, spirits 40% v/v). One of the leading causes of alcohol abuse is increased availability of alcohol, especially the illicit brews. Other causes include affluence and poverty resulting in frustrations and consequently leading to abuse of drugs and alcohol (Weru, 2009). Weak social control systems (Rutherford, 2009) accelerate

drugs and substance abuse. Our society has increasingly failed to provide proper guidance and care to youths. When parents, community and religious groups abandon their role of nurturing the youth, they (the youth) become vulnerable to peer pressure and especially when youth think alcohol drinking is a fad and normal, in social functions. The situation is compounded by the growing hopelessness in society. Young people can no longer access job opportunities and, as we are all aware, an idle mind is the devil's workshop. This makes young people experiment with substances, including alcohol (Weru, 2009). There is laxity and corruption among law enforcement agents such as chiefs and their assistants who receive protection fees from brewers and/or collaborate with them (NACADA, 2004). Exposure to television programmes and other media, mostly from the West, erodes the morality of most young people who have taken wayward celebrities as their role models. It is thus not surprising that youth are considered an ill-informed and "misguided generation" (Sunday Nation Team, (March 4th p. 5).

2.3.1 Research on Effect of Alcoholism on Nutritional Status of Children Internationally

Based on clinical observations and preliminary research in India, a relationship between parental alcoholism and child abuse was observed in a large proportion of child abuse cases (Rao et al., 2001). Findings from Rao et al (2001) study showed that children of alcoholics were at higher risk for physical injuries and malnutrition. In the Rao et al study, neglect and physical abuse of children of alcoholics were compared with children of non-alcoholics in a General Hospital in a Medical College in India. Specifically, 72 children of alcoholics were compared with 81 of non-alcoholics as controls. Results showed that eighty six per cent of children in the experimental group and 49.4 per cent in the control group were malnourished to various extents. Forty five percent of the children of alcoholics had physical injuries, in contrast to twenty three percent of children of non-alcoholics. Malnutrition co-existed in almost all injured children of

the alcoholics. Noteworthy, Rao et al. observed that alcoholism in parents of malnourished and injured children was frequently ignored in routine clinical evaluation. This assertion lends credence to the present study with the aim of assessing the magnitude of risk for the children in Kenya becoming malnourished due to alcoholism.

Children of alcoholics are likely to be vulnerable to malnutrition and their growth development remains poor. The effects of alcohol on an unborn child, for instance, are irreversible. Some children born of mothers who drink while pregnant can have foetal alcohol syndrome (FAS), a lifelong set of physical, mental, and neurobehavioral birth defects.

Living with an alcoholic in the family can contribute to stress for all members of the family. Children often live with pervasive tension and stress, have low self-esteem, experience higher levels of anxiety and depression, exhibit higher rates of behavioural disorders, perform poorly in school, and have problems coping with everyday life. That said, each member may be affected differently. Not all alcoholic families experience or react to this stress in the same way. Children of alcoholics can learn to trust and handle their feelings in healthy ways, and build a positive nurturing relationship that protects them from problems with alcohol.

There is strong, scientific evidence that alcoholism tends to run in families. Children of alcoholics are four times more likely than those of non-alcoholics to develop alcoholism. However children of alcoholics can learn to build positive relationships, and avoid the same problems with alcohol. The level of dysfunction or resiliency for a non-alcoholic spouse is the key factor in mitigation of alcoholism effects that impact negatively on the children. Many children in the US, for instance, are raised by addicted parents. With more than one million children confirmed each year by state child protective service agencies as victims of child abuse and neglect, state welfare records have indicated that substance abuse is one of the top two

problems exhibited by families in 81% of the reported cases (Turney, 2007). Although there is dearth literature on alcoholism and child abuse in Kenya, an educated guess is that alcoholism is a contributing factor to child abuse in Kenya.

Research data suggest close relationship between alcohol problems and mental health (Turney, 2007). People with mental health problems are at an increased risk for alcohol problems and vice versa. The 2004 National Survey on Drug Use and Health demonstrated that the prevalence of alcohol dependence overall, is more than twice as high in those with mental disorders as in the general population. The same study found that 8.3 percent of the adult population had one or more mental disorders, but that figure rose to 20.6 percent when alcohol abuse or dependence was a factor. It is not clear whether mental health problems are a cause or a consequence of alcohol problems. People may use alcohol to cope with a variety of mental health problems, including depression, anxiety, obsessive-compulsive disorder, bipolar disorder, and schizophrenia. On the other hand, alcohol abuse or dependence can cause a range of problems such as family conflict, job loss, and financial worries that are likely to result in increased levels of anxiety and depression. Some researchers believe there is a common genetic or early family environmental factor that may contribute to both a mental health problem and an alcohol problem in some individuals.

2.3.2 Research on Effect of Alcohol Consumption in Kenya

Data collected by the Tegemeo Institute of Egerton University indicates that the older generation is the one doing the hard work on farms (Weru 2009). Meanwhile the youths spend their prime years in alcoholism, and only 30 per cent of agricultural production is in the hands of people aged below 50 years. Such situation can be confirmed by the fact that the average age of the Kenyan farmers is 59 years, and about 30 per cent of them are older than 65. This means that

Kenya relies largely on the older generation for food production. According to Dr. Mary Mathenge (Weru 2009), the elderly are generally associated with traditional methods of farming, while the youth tend to have higher adoption rates for new technology (Weru, 2009). With reduced involvement of youth in agriculture, there is likely to be lower productivity in agriculture. Thus the rural economy is threatened with collapse due to idleness and drunkenness among people who are young and strong. Worse still, those below 50 years of age are also productive and have the highest number of children whose nutritional status is likely to be affected by alcoholism. This situation has serious implications on the nutritional status of the populace in general and worse still for an alcoholic and his dependents. While illicit brews appear "pocket friendly," in reality however, they are very costly in many other ways given that they are a risk to the health of abusers and their families.

The dire consequences on the Kenyan economy due to the prevalence of alcohol abuse among the youth has been comprehensively reviewed (e.g., in the Daily Nation of 4th April 2009). Seventy per cent of people under the age of 29 are abusing alcohol. Western Kenya leads in alcohol abuse with a prevalence of 90 per cent among the youth, followed by Nairobi (89.9 per cent) and Nyanza (86.1 per cent) (Weru, 2009). North Eastern Province with alcohol abuse rate of about 15.6 per cent is lowest (Weru, 2009). The youths, according to Daily Nation of 4th April 2009, neglect their wives and marriages, abdicate their responsibilities and are simply wasting away and unable to take care of their families if they have them. Alcohol abuse also exposes many young people to HIV/AIDS and their education standards go down due to drugs and alcohol abuse. Their meagre resources are spent on alcoholism. Alcohol abuse also causes death to many people, creating orphans or children brought up by single parents, and destroy happiness and peace in the family and society

2.3.3 Alcoholism and Children's Nutritional Status

The studies cited above provide useful information about the effect of alcohol on families, including children. Whereas this information was important for the present study, it was insufficient in so far as it did not link alcohol consumption to the nutritional status of children.

2.4 Gap in Knowledge

Studies highlighted in this chapter focused on the relationship between nutritional status and factors such as socio-economic status, introduction of complementary foods and dietary intake. There is a dearth of research information linking nutritional status of children born in alcoholic homes and alcohol consumption by household heads (HHH). This research study was, therefore, meant to bridge this gap of information

CHAPTER 3: RESEARCH METHODOLOGY

3.0 Study Setting

3.1 Study Area

The study area was Ol'lessos, one of the nine Divisions of Nandi district and currently divided into seven locations. Nandi district is on the Western side of the Rift Valley Province and lies between latitudes 0.111° South and 0.561° North, and longitudes 34.737° and 35.435° East. It borders Uasin Gishu, Kericho, Kisumu, Vihiga and Kakamega districts. The district covers an estimated area of 2,873km² (CBS, 2001) (see Appendix 6), and has its main town as Kapsabet.

3.1.1 Population and Population Growth

The population of Nandi district was estimated at 578,751 persons in 1999 (CBS 2001) and projected to increase to 751,351 people in 2008 at an annual growth rate of 2.9%. The population of Ol'lessos division was estimated to be 22,000 people and an average household size was given as 5-7 persons in 1999 (CBS 2001).

3.1.2 Topography of the Area

The topography of the district is dominated by Nandi Hills and Nandi Tea Zone. Local people are mostly of the Nandi tribe.

3.1.3 Health

Infant mortality rate in Nandi district stands at 66/1000 live births and is not significantly different from the national average of 62/1000. The crude birth and total fertility rate for the district during 1979 and 1989 stood at 50/1000 and 7.6 respectively. Life expectancy is 48 years for males and 51 years for females, while the Crude Death Rate (CDR) is given as 8.8/1000

population (Central Bureau of Statistics, 2001). In 1995, there were 956 reported cases of malnutrition in the district. Nandi District has 106 established health facilities. The most prevalent childhood illness in the district is malaria (GoK, 2002). Other illnesses include respiratory tract infection and skin disease.

The prevalence of HIV in the district is a worrying factor. The rate has increased from 2.3 per cent in 1988 to 12.9 per cent in 1999, and alcoholism is expected to have played a role in the worsening of the situation. The most affected age group is 22 – 39 years old. This is the most active and productive age group in terms of economic activities. The doctor:patient ratio is very low (1:80,000). Table 3.1 below summarises facts related to health in Nandi District.

Table 3.1: Health Facts in Nandi District

Most Prevalent Diseases	Percentage (%)
Malaria	38
Respiratory Tract Infections	23
Skin Diseases	6.2
Doctor/Patient Ratio	1:80,000
No. of Health Facilities	106
No. of Hospitals	3
No. of Health Centres	15
No. of Dispensaries	60
No. of Clinics	28
Average Distance to Nearest Health Facility	6 km
% of Household with Access to Health Facilities	55

Source: MPND (2002-2008).

3.1.4 Economy and Livelihoods

Agriculture is the backbone of the Nandi district's economy. Over 90% of the district population is engaged in this sector. The sector contributes over 52% of household income.

Agriculture has the largest work force of 325,000 people and the highest potential for investment. In addition, it is a high-income generating sector and therefore contributing immensely towards poverty reduction. The main food crops cultivated are maize, beans, Irish potatoes, sorghum and millet while the main cash crops are tea, coffee, sugarcane and pyrethrum. The main livestock breeds include zebu cattle, dairy cattle, sheep, goats and poultry. From personal observation and experience alcohol production and consumption has been one of the sources of livelihood and social recreation for some households in the division.

3.1.5 Social Services

About 23% of households in the district are female-headed and the ones worst affected by poverty (CBS 2001). There are disparities in the provision of education to girls. Though the ratio of girl to boy child is 1:1, this is not reflected in the enrolment in education institutions and especially secondary schools, where there are only 6,824 girls enrolled against 7,559 boys (CBS, 2001). Organizations such as Maendeleo ya Wanawake and National Council of Women of Kenya have launched vigorous campaigns in the district aimed at making women aggressive for their rights (CBS 2009).

3.2 Research Methods

3.2.1 Sample Size Determination

The sample unit was the household. Fischer's formula (Fischer et al, 1991) was used to calculate the sample size in the two study groups as follows:

$$n = z^2 pq / d^2$$

Where, n = the desired minimum sample size.

z = statistically certainty chosen at 1.96 corresponding to 95% confidence interval.

d= desired accuracy 5% (0.05)

p= estimated prevalence % of malnutrition.

q= 1-p

$$n = \frac{(1.96)^2 (0.08) (1-0.08)}{(0.05)^2}$$

=113 HH

5% attrition = 5.6 HH

=113 + 6 attrition therefore n=119HH + 51 weighting = 170HH

For good comparison, there ought to be equal chances to both alcohol- and non-alcohol consumer groups. During data collection, however, the researcher found out that the sample for alcoholic households was insufficient after completing 119 households. The researcher thus resorted to weighting and collected data from a further 51 households through random sampling. The 51 households fit the inclusion criteria and were considered sufficient enough statistically for comparison purposes of the two groups.

3.2.2 Study Population

The sample population consisted of 84 alcohol consuming and 86 non-alcohol consuming households with children 6-59 months in Ol'lessos Division for a total of 170 households.

3.2.3. Study Design

A cross-sectional research study design was used in data collection for the two study groups of the households to determine the effect of alcohol consumption on the nutritional status of children aged 6-59 months.

3.2.4 Sampling Procedure

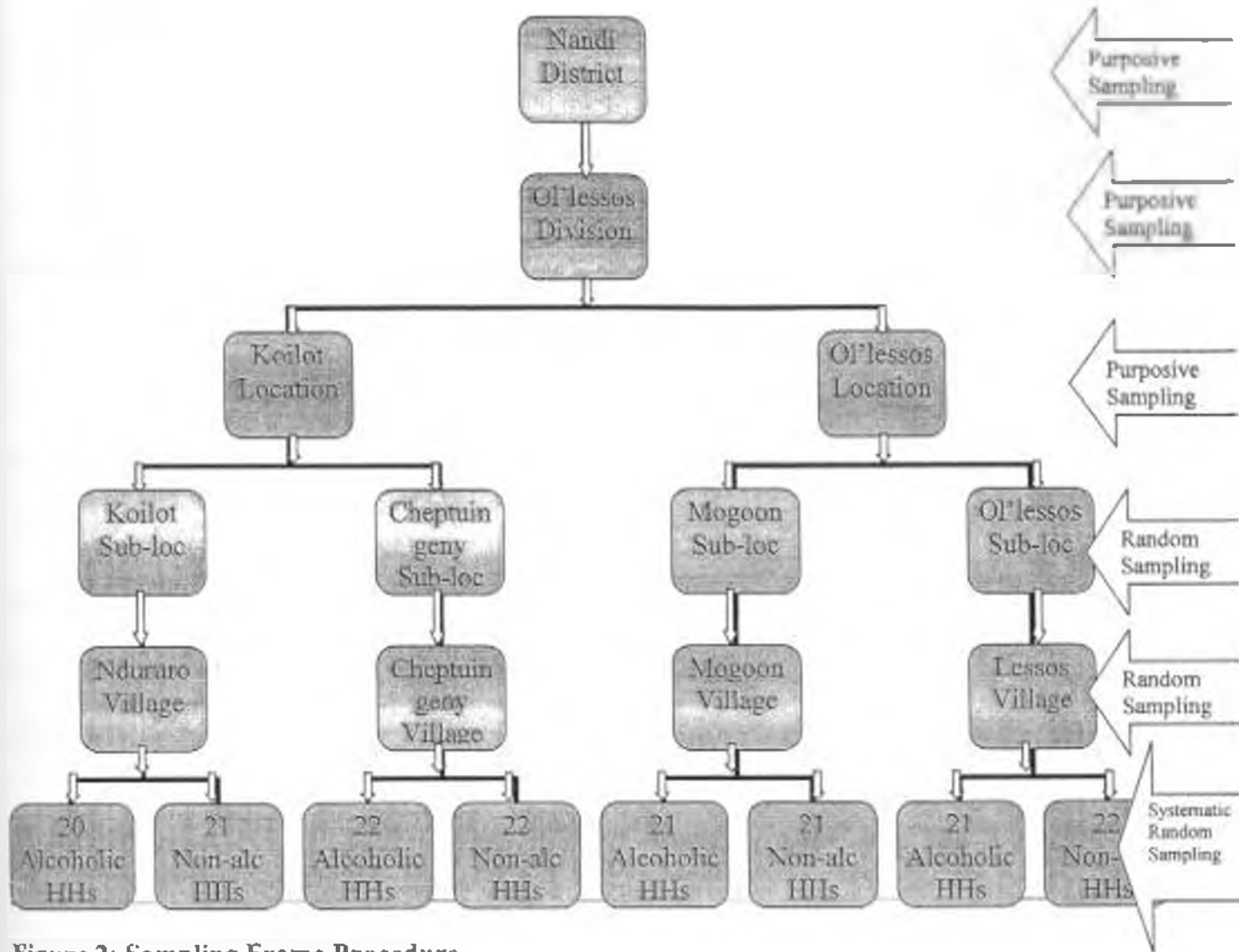


Figure 2: Sampling Frame Procedure

Nandi district was purposively selected because in the researcher's own observation, there was high poverty level due to alcohol consumption. Ol'lessos division was purposively selected out of nine divisions in the district because of high population of alcohol consumers according to the researcher's estimation. Two out of four locations of Ol'lessos were purposively selected. Four sub-locations were purposively selected; two from each location. Through simple random sampling, one village was picked from each sub-location and 42, 43, 42 and 43

households were selected through simple random sampling respectively from each village.

3.2.5 Study Unit and Inclusion Criteria

The study unit was the household. The inclusion criteria were households with child caregivers/duty bearers who were alcohol and non-alcohol consumers and children aged 6-59 months. The caregiver/duty bearer was the main respondent for data collection on alcohol consumption and other dietary information. There was further sampling of children in households that had more than one eligible child, through balloting (yes and no) system to ascertain the nutritional status of children within the household. Measurements of both children were taken to ascertain or compare the most affected between the older and the younger one.

3.3 Research Tools

1) **Questionnaires:** A structured questionnaire was designed and pre-tested. It was then used to collect quantitative data on:

- Demographics: sex, age, marital status, education, occupation, religion, alcohol status, main source of livelihood.
- Socio-economic status: housing, land and expenditure.
- Nutritional status through anthropometry: age, weight, height, MUAC and oedema.
- Dietary diversity through 24-hour recall.
- Morbidity - sickness of the target child in the last two weeks prior to data collection.
- Mortality - death in the household in the last three months.

2) **Focus Group Discussion:** A focus group discussion forum was used to collect qualitative data on the livelihood practices of alcoholics and non-alcoholics.

3) Case Studies: Case studies were done on three categories of care givers/duty bearers namely:

i) Alcoholics ii) Non-alcoholics and iii) Rehabilitated alcoholics. The exercise was used to develop an in-depth snap-shot into the lifestyles of alcohol abusers.

3.4 Resource Requirement

The following resources were helpful in conducting the research.

- **Personnel:** Ten (10) field assistants, One (1) Statistician consultant, Two (2) Supervisors.
- **Equipment:** Five (5) Salter Scale, Tape Measures, Plastic Pants, Measuring Boards and Measuring Cylinders.
- **Stationery**
- **Travel and per diem allowances.**

3.5 Data Collection Procedures

(i) Recruitment and Training of Field Assistants

With the help of the divisional officer, ten field assistants were recruited. Priority was given to local people able to speak the native language, Nandi. In addition, they had to have a minimum of form-four level of education and willing to participate in the exercise. Those with prior experience in questionnaire administration were given preference. A two-day training session was conducted for the assistants. The training entailed questionnaire administration techniques and the use of equipment and tools (see Appendix 3).

(ii) Pre-Testing of Questionnaire

The questionnaire was pre-tested away from the study site but in an area with the same characteristics desired. The 10 pre-tested households were thus not included in the present study. Following the pre-test, corrections were made before the main data collection.

(iii) Demographic and Socio-Economic Data

Data on household composition, education level, marital status, occupation and income levels were collected using the structured questionnaire.

(iv) Nutritional Status

Anthropometric measurements of children between 6 and 59 months were taken to determine their nutritional status. The tools and equipment used included Salter scale, plastic hanging pant, digital scale, sisal rope, height/length board and MUAC tape.

The ages of children were determined using clinic attendance cards to ascertain their ages. Where this document was unavailable, information on the age of the child was obtained from the care-giver.

The length for children below two years of age, were measured using the measuring board by laying the child horizontally on the measuring board. Their lengths were then read, and readings recorded to the nearest 0.1 cm. The process was repeated once and the readings recorded again. Each child's average length was then calculated using the computer

For children above two years, their vertical height was measured using the measuring board in an upright position. The child was requested to stand bare-footed on the flat side board, with their hands hanging freely, feet parallel to the floor with knees and buttocks, shoulders and back of the head touching the upright measuring board. The headpiece of the board was lowered gently such that it touched the crown and the head. Then the child's height was measured to the

nearest 0.1 cm. The process was repeated once for accuracy and the readings averaged.

The children were weighted using a Salter scale. A plastic pant was first put on the lower end hook of the scale and the scale adjusted to zero. The pant was then removed and put on a child with light clothing. The pant with the child was then hooked onto the scale and allowed to hang unsupported for the reading to be taken. The weight was read to the nearest 0.1 kg with scale at high level. The weighing was repeated and the readings recorded and averaged.

(v) **Middle Upper Arm Circumference (MUAC)** was taken and recorded for all children using a MUAC tape.

(vi) **Alcohol Consumption**

On alcohol consumption data collection, research assistants approached the household head with confidence using the common local name for alcohol consumers "*tos iboisie tukcho bo bolsiek?*" Meaning, "Do you use those things that old men use?" This is because it is respectable that way and one is sure of truthful response. For the amount consumed, the research assistants used local cups commonly used by alcohol consumers to be able to estimate the quantity.

(vii) **24-Hour Recall and Dietary Diversity**

Dietary diversity was obtained using 24-hour recall. Every household was asked to give the record of food that they had consumed in the past 24 hours. A structured questionnaire (see Appendix 1) was used to collect this information.

3.6 Ethical and Human Rights Consideration

A research permit from the University in collaboration with the Ministry of Higher Education Science and Technology was sought before commencing the research work. In addition, local leaders and relevant authorities in the study area were contacted before the start of

the study and informed accordingly. Consent (verbal and written as appropriate) was obtained from the respondents before administering the questionnaire or taking of any measurements. In this regard, study objectives were explained to all respondents, who were then assured about confidentiality in handling any information disclosed by them. To this end, pseudonyms are used to maintain anonymity of respondents. Throughout the research process privacy, respect and dignity of all respondents was upheld and their safety safeguarded. For instance, children were not stripped naked when their weights were being taken, and instead, were required to wear light clothing to avoid inaccuracies in weight readings. The respondents were promised a report of the study results after the conclusion of the study. Another right was that the respondents were free to withdraw from participation at any point without explanation or intimidation.

3.7 Data Cleaning

Data cleaning was done daily to minimize errors. Specifically, each questionnaire was screened to ensure that all questions had been answered correctly and clearly. Errors were corrected by the researcher re-visiting respondent for further clarification.

3.8 Data Management and Analysis

3.8.1 Data Quality Control

The validity of the tools of the study was assessed through pre-testing. Close supervision of the interviewers was also done. Measurements of all weights and heights were done in kg and cm respectively and the measuring equipment calibrated during this process. The data collected were screened and cleaned for inconsistencies (e.g. height/length measurements in cm not inches, age in months 6-59, etc). Outliers in Anthropometry data were taken care of using SMART Flags found in ENA software package.

3.8.2 Data Management and Analysis

Table 3.2: Key Indicators and Cut-off Points

Indicator	Cut-off Points
Alcohol Consumers	Anybody consuming alcohol more than 500ml per day
Alcohol Abusers	Anybody consuming three or more litres of alcohol per day and more than three days in a week
Wasted	Weight-for-Height ≤ -2 z-scores
Stunted	Height-for-Age ≤ -2 z-scores
Underweight	Weight-for-Age ≤ -2 z-scores
Low Dietary Diversity	Those consuming less than 4 food groups
Under Five Mortality Rate	Accepted $< 1/10,000/\text{day}$. Alert $\geq 1/10,000/\text{day}$

Mortality rate was calculated as follows:

$$\text{Mortality rate} = \frac{\text{No. of deaths in a year of children 6-59 months}}{\text{No. of live births in the same year}} \quad (\text{Mausner 1985})$$

Upon arrival from the field, data were cleaned, entered, and analysed using SPSS and ENA for SMART software. The variables for each objective were defined and coded for ease of analysing the data. Frequencies, means, standard deviation, percentages were determined and used to report results. The study hypotheses were also tested to determine any association between variables.

Data on the anthropometry was converted to Weight-for-Height (WHZs), Weight-for-Age (WAZs) and Height-for-Age (HAZs) Z-scores below the mean with reference to NCHS (1977) and WHO (2005) growth reference values using the ENA for SMART software. WHZ < -2 Z-scores indicated wasting or thinness due to recent and severe weight loss, often associated with acute starvation or severe disease. WAZ < -2 Z-scores indicated cases for underweight.

HAZ. <2 Z-scores indicated chronic stunting, often due to repeated exposure to adverse conditions. Statistical and graphical distributions of the main exposures, outcomes and confounding variables were used for descriptive analysis. The unadjusted associations of the main exposure and outcome and confounding variables were determined by Chi-Square analysis and expressed as odds ratios and 95% confidence intervals. For secondary analyses, linear regressions for the associations were conducted using WHZ and HAZ as continuous variables. Effect modifiers (interactions) were explored by stratified analyses. Multiple tests of statistical significance of factors were done to determine rejecting or retention of null hypotheses. All analyses were performed using the SPSS 11.5 statistical software package.

3.8.3 Development of Data Entry Template

Data entry template was developed and tested with pre-test data before data collection. This made it easy for daily entries of data collected in the field.

CHAPTER 4: RESULTS

4.0 Nutritional Status of Children 6 to 59 Months in O'lessos Division

Children under study from both alcohol and non-alcohol consuming households had their weight, height/length measured and their ages determined to ascertain their nutritional status. As shown in Table 4.1 and Figure 3 and 4, a higher percentage of children (38.1%) of alcohol consuming households were underweight compared to that of non-alcohol consuming households (33.0%). A higher percentage of children (36.3%) of alcohol consuming households were stunted compared to that of non-alcohol consuming households (29.1%). Likewise a higher percentage of children (16.7%) of alcohol consuming households were wasted compared to that of non-alcohol consuming households (16.6%). As much as the nutritional status of children from alcohol consuming households appeared poorer than that of children from non-alcohol consuming households, this difference was not statistically significant [$\chi^2=0.247$: $p> 0.05$], but between male and female there was a statistical significant difference portraying that boys are prone to malnutrition more than girls [$\chi^2=0.048$: $p<0.05$].

Table 4.1: Malnutrition in Children

	Wasting (WFH)(N=28)		Underweight (WFA)(N=60)		Stunting (HFA)(N=52)	
	Alcoholic % (N=84)	Non-Alcoholic % (N=86)	Alcoholic % (N=84)	Non-Alcoholic % (N=86)	Alcoholic % (N=84)	Non-Alcoholic % (N=86)
Severe	2.4	7.1	6.0	5.9	10.0	7.6
Moderate	14.3	9.5	32.1	27.1	26.3	21.5
Normal	83.3	83.3	61.9	67.1	63.8	70.9
Males	15.9		37.1		40.0	
Females	11.5		20.6		37.8	

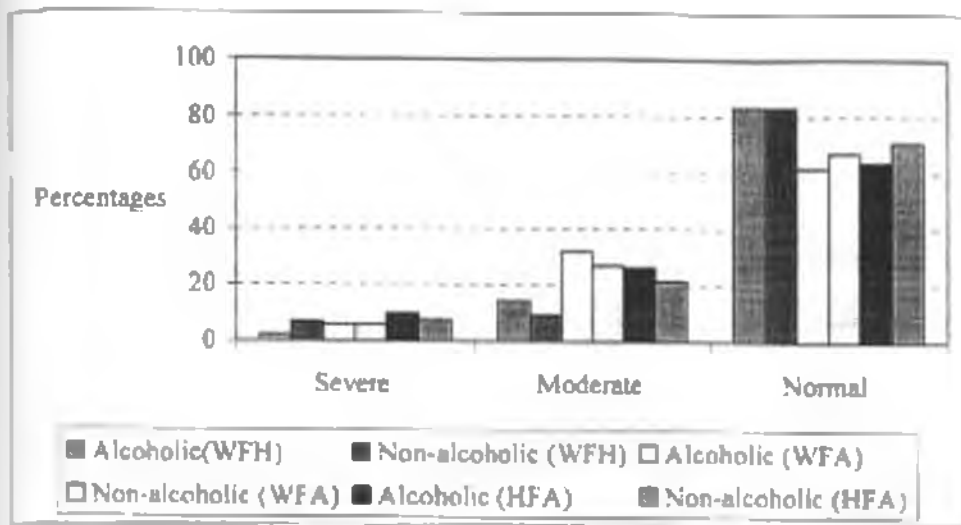


Figure 3: Children's Nutritional Status by Alcohol Status of household heads (HHH)

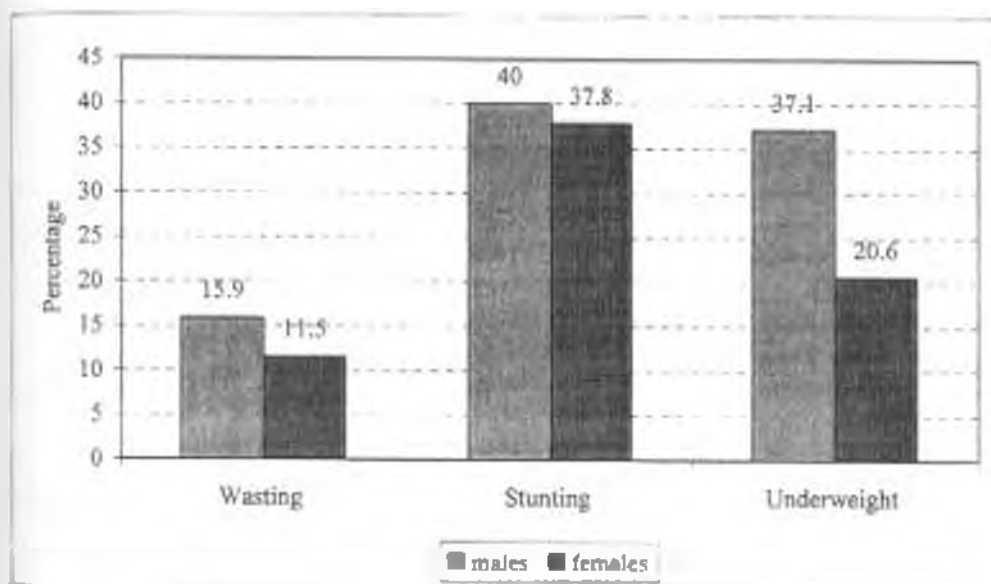


Figure 4: Nutritional Status of Children by Sex

4.1 Dietary Diversity

Dietary diversity is a measure that determines the number of food groups consumed in a household within a twenty-four hour period. The goal usually is to find out whether households are eating a balanced diet that constitutes not less than four food groups. Twenty four-hour recall

of food consumption in the households was used to determine dietary diversity. Questions asked targeted the type of food consumed such as cereals and cereal products, milk and milk products, meat, poultry, pulses, fruits and vegetables. From Table 4.2 the results show that households consumed a mean of 6.2, median 6 and a mode of 6 different types of food. Thirteen households consumed less than four types of food groups. From Chi-Square analysis, the relationship between alcohol consumption and food diversity was statistically significant [$\chi^2=0.012$; $p<0.05$]. Those HH with alcohol consuming HHH had 12 HH consuming <4 types of food groups while those of non-alcohol consuming HH only one consumed less than 4 types of food groups.

Table 4.2: Dietary Diversity by Type of Household

Total Number of Food Groups	No. of Alcoholic Households	No. of Non-Alcoholic Households	Total No. of Households	Percentage (%)
3	2	0	2	1.2
4	10	1	11	6.5
5	19	10	29	17.1
6	26	32	58	34.1
7	21	32	53	31.2
8	4	11	15	8.8
9	0	2	2	1.2
Total	84	86	170	100.0

4.2 Relationship between Morbidity and Alcohol Consumption

The present research sought to determine the morbidity among children under five years of age in households. Alcohol consumption contributes to child negligence and high morbidity. As shown in Table 4.3, a high percentage (55.1%) of children from alcohol consuming households were ill within two weeks prior to the research study compared to those of non-alcoholic households (44.9%). Further statistical analyses confirmed that the morbidity level was

significantly higher among children from alcoholic households than among those from non-alcoholic households ($\chi^2=0.045$; $p<0.05$).

Table 4.3: Illness in Child and Alcohol Consumption of Household Head

Ill	Alcohol Consumption %	
	Yes	No
Yes	55.1	44.9
No	39.7	60.3
Significant Levels	0.045	

4.3 Households and Prevalence of Alcohol Consumption

As shown in Table 4.4, 50.6% (86) household heads of 170 households did not have alcohol consumers while 49.4% (84) were consuming alcoholic beverages. More male-headed (75%, N=63) than women-headed (25%, N=21) households consumed alcohol. Chi-Square analysis performed to determine gender differences in alcohol status of household heads was statistically significant ($\chi^2=0.020$; $p<0.05$). Odds ratio showed that males consumed alcoholic beverage three times more than women [OR: 2.54, CI: 1.63-3.99]. This is a contributing factor to malnutrition given that males are considered breadwinners in the household studied yet they are the ones with the highest percentage of alcohol consumption.

As shown in Table 4.4, the highly consumed type of alcohol in the area is Busaa (46.4%), followed by Chang'aa (22.6%). Only 7.1% of the respondents consumed Beer. Findings show that 23.8 % consumed alcoholic beverage that they can find at any time. Many of the consumers (41.7%) drink in the evening. About 4% drink in the morning, 20.2% in the afternoon, while the rest 34.5 % drink any time. Data reveal that 21% (18) of household heads do not abuse alcohol (consume two or less litres of alcohol per week), while the rest 79% (66) are alcohol abusers (consume three or more litres of alcohol in a day for more than three days in a week).

Table 4.4: Respondents Views about Alcohol*Responses on Alcohol and Alcohol Abuse (%)*

Number of Households (household heads) (N=170)	Without Alcohol Consumers (N=86)	50.6
	With Alcohol Consumers (N=84)	49.4
	Alcohol Abusers (N=66)	79
	Non-Abusers (N=18)	21
	With both HHH and Spouse Consumers (N=7)	8.3
	With more than one Consumers(N=28)	33.3
Alcohol Consumers by Sex (child care providers' household heads) i.e.	Male (N=63)	75
	Female (N=21)	25
	TOTAL (N=84)	100.0
Type of Alcohol	Busaa	46.4
	Chang'aa	22.6
	Beer	7.1
	Mix	23.8
	Male (N=63)%	Female(N=21)%
Busaa	51.2	20.2
Chang'aa	17.9	3.6
Beer	6	1.2
Time of Consumption(N=84) %	Morning (Before 1 pm)	3.6
	Afternoon (Between 1pm and 6 pm)	20.2
	Evening (After 6 PM)	41.7
	Anytime	34.5
Action after Consumption (N=84)%	Beat Wife	13.1
	Beat Husband	1.2
	Beat Children	4.8
	Chase Away Everybody in House	13.1
	Stay Calm	59.5
	Go to Sleep	8.3

4.3.1 Amount (litres) Consumed in the Last Seven Days

The amount of alcohol consumed in the last seven days is very important in this research as it helps to show whether amounts of consumption has any relationship with malnutrition of child in the household. As shown in Figure 5, only 18 households consume ≤ 2 litres of alcohol in a week while the rest consume >3 litres a week. This has a negative impact on the nutritional status of children in O'lessos.

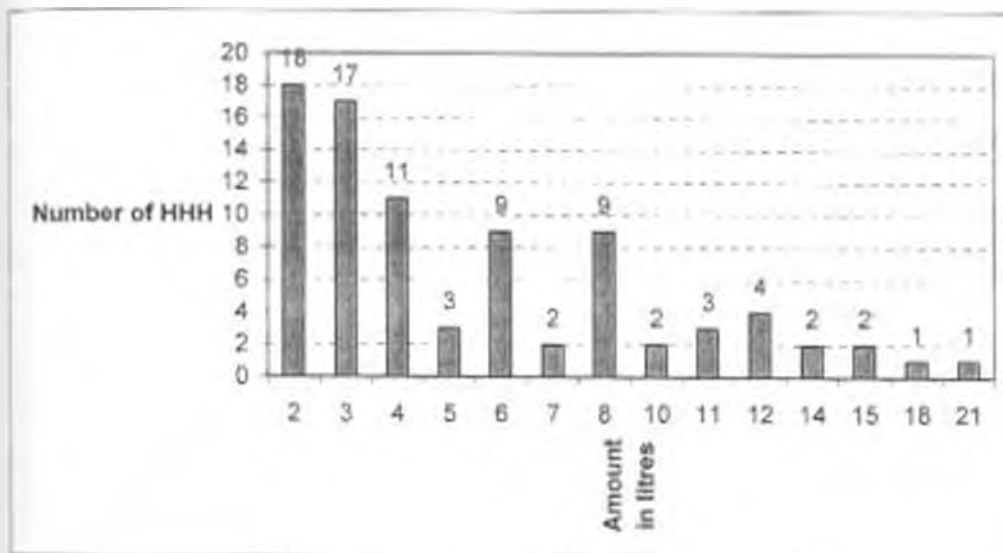


Figure 5: Amount (litres) Consumed in the Last Seven Days

4.3.2 Amount of Alcohol Consumed in Litres and Nutritional Status of Children

Alcohol consumers in this study are said to abuse alcohol when their consumption is more than three litres a week. It is highly probable that high alcohol consumer households have malnourished children. As shown in Table 4.5, households that consumed 3 litres of alcohol had the highest number of malnourished children. Independent Sample *t*-test was performed to determine whether there was significant mean difference in WFA and HFA between consumer- and non-consumer households. Analysis shows that there was no statistical difference between the means of consumer and non-consumer households [WFA T-test $t = -1.437 = p \text{ value} > 0.05$]

and [HFA T-test $t = -1.166 = p \text{ value} > 0.05$].

Table 4.5: Amount of Alcohol Consumed versus Number of Children Malnourished

Amount in Litres	No. of HH(N=84)	No. Wasted(N=13)	No. Underweight(N=29)	No. Stunted(N=29)
2	18	2	7	8
3	17	2	10	7
4	11	3	2	1
5	3	0	1	2
6	9	2	3	1
7	2	2	2	1
8	9	0	0	2
10	2	0	0	0
11	3	1	1	1
12	4	1	1	2
14	2	0	0	1
15	2	0	1	2
18	1	0	0	1
21	1	0	1	0

As shown in Figure 6, there were a higher number of malnourished children in male-headed households consuming alcohol than in female-headed households in Ol'lessos. Children in households headed by a male and consuming alcohol are likely to have a higher prevalence of malnourished children than the households headed by female.

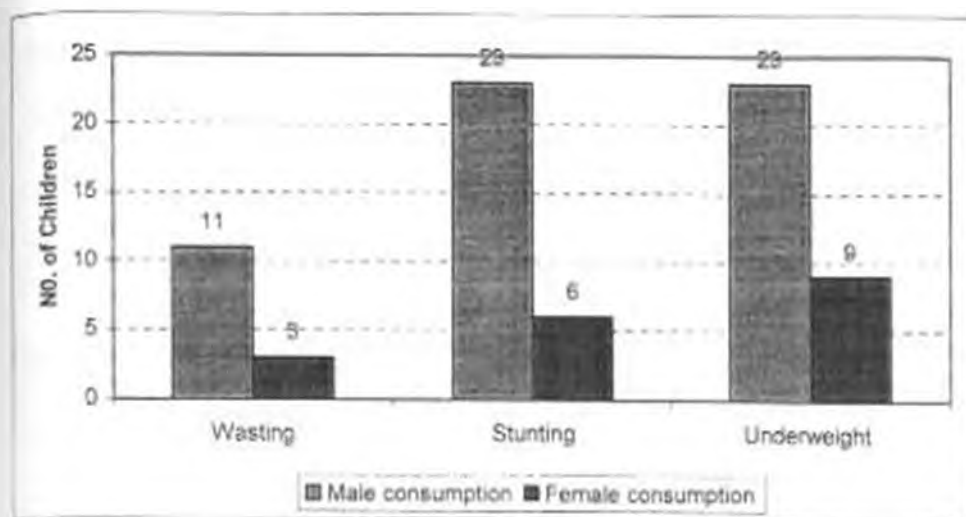


Figure 6: Amount of Alcohol Consumed and Malnutrition in Children

4.3.3 Relationship between Amount of Alcohol Consumed and Some Selected Variables

Results from Table 4.6 show that independent variables important in predicting amount of alcohol consumption are: source of livelihood, type of house, food expenditure and acres of land. Data shows that the more one consumed alcohol the less they spend money on food [$B = -.265$; $p = .028$], a statistically significant finding. So if the population reduced alcohol consumption in a week then there would be more amount of money to be spent on food.

Adequate food may reduce malnutrition in children

Table 4.6: Stepwise Regression of Amount of Alcohol Consumed and Selected Variables

Variables	Amount of Alcohol Consumed in Seven Days	
	Beta	P-value
Source of Livelihood	-.144	.215
Type of House	-.009	.937
Food Expenditure	-.265	.028
Acres of Land	-.118	.305

4.3.4 Amount of Alcohol Consumed in the Last Seven Days and Nutritional Status of Children

Amount of alcohol consumed by a household head is assumed to have a positive correlation with irresponsible behaviour including abdicating of one's responsibilities to provide their family's dietary needs, with obvious consequences to the nutritional status of children. Noteworthy, and as shown in Table 4.7, Pearson correlation (2-tailed) analysis yielded [$\chi^2 = -.016$; $p > 0.05$] (WHZ), [$\chi^2 = -.009$; $p > 0.05$] (WAZ) and [$\chi^2 = -.041$; $p > 0.05$] (HAZ) indicated no correlation between amount of alcohol consumed and children's nutritional status.

Table 4.7: Amount of Alcohol Consumed in the Last Seven Days and Malnutrition

Alcohol Consumption in the past 7 Days		WHZ-NCHS	WAZ-NCHS	HAZ-NCHS
Pearson Correlation		-.016	-.009	-.041
Sig. (2-tailed)		.887	.934	.720
N		84	84	80

4.3.5 Correlation with Malnutrition Z-Scores

Results in Table 4.8 showed that the independent variable important in predicting Weight-for-Age (under-weight) was dietary diversity [$r = .2269$; $p = .050$]. In turn the independent variable important in predicting dietary diversity was the amount of alcoholic beverage consumed in a week [$r = -.3534$; $p = .002$]. This means that the more one consumes alcohol the poorer the nutritional status of a child is in terms of weight, which is contributed by low dietary diversity.

Table 4.8: Significant Factors for the Three Nutritional Indicators

Correlation	Underweight		Stunting		Wasting		Food Diversity	
	R	p-values	R	p-values	R	p-values	R	p-value
Amount Consumed in 7 Days	-.0659	.585	-.1103	.360	.0581	.631	-.3534	.002
Food Diversity	.2269	.050	.1533	.202	.1268	.292	-	-

4.3.6 Action after Consuming Alcohol and Nutritional Status of Children

Action after alcohol consumption determines the care a child is given. Unruly situations challenge the care and security of the child therefore rendering the child vulnerable to malnutrition. As shown in Figure 7, more than half (60%) of the alcohol consumers stay calm after consuming alcohol, 13% beat their wives, another 13% chase away everybody from the house and 1% beat her husband.

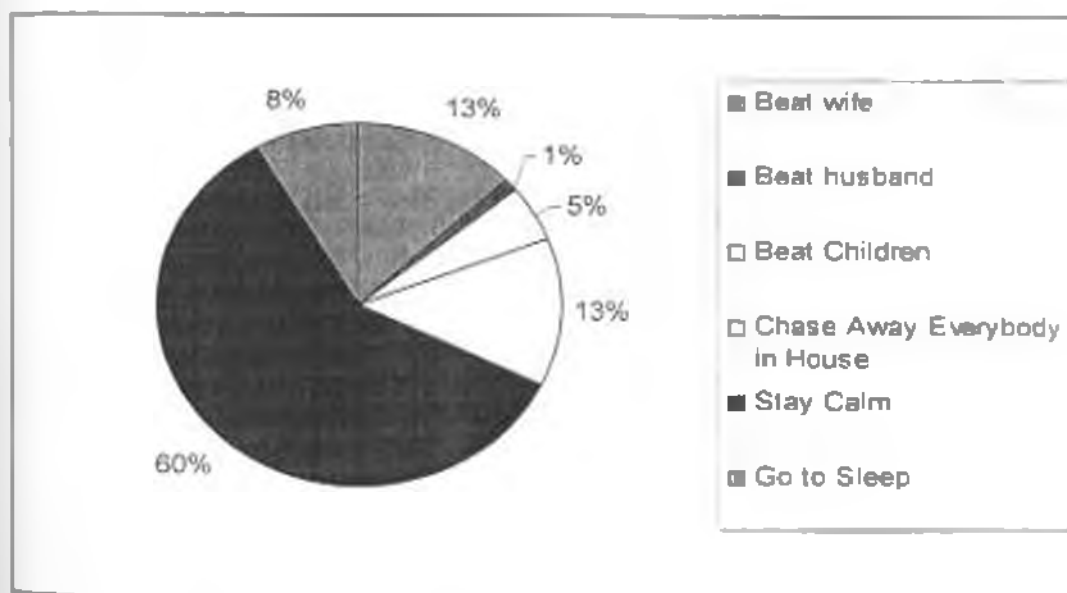


Figure 7: Actions after Alcohol Consumption

Chi-Square analysis on action after consuming alcohol and nutritional status of children was not statistically significant [$\chi^2 = .732$; $p > 0.05$]. From Table 4.9, most of the malnourished children come from households where household heads consume alcohol in the afternoon, followed by those children where household heads consume in the evening. Although there were very few alcohol consumers who became violent, it can be challenging to that particular child who lives under such conditions.

Table 4.9: Time of Alcohol Consumption and Nutritional Status of Children

	Wasting %	Underweight %	Stunting %
Morning	30.3	33.3	32.3
Afternoon	16.3	57.1	46.2
Evening	15.7	41.2	43.4
Any time	17.6	27.3	25.9

4.3.7 Those that Found Alcohol an Issue and Sought Help

As shown in Table 4.10, 38.1 % (32) males and 17.9% (15) women of the 84 alcoholic households found alcohol consumption an issue (cannot do without yet do not have enough money to spend for alcohol and household food). Twenty five per cent (21) males and 4.8% (4) females had sought help from various sources. A further 72% (18) of these male and 16% (4) of the female had sought counselling while the rest 12% (3) males had sought rehabilitation.

Table 4.10: Those that Found Alcohol a Problem and Sought Help

	Males (N=63) %	Females (N=21) %	Total (N=84) %
Alcohol an issue	38.1	17.9	56
Sought help YES	25	4.8	29.8
Type of help			
Counselling	72	16	88
Rehabilitation	12	-	12

4.4 Relationship between Alcohol Consumption and Nutritional Status of Children

Respondents were asked whether or not alcohol consumption had any effect on children's nutritional status. As shown in Table 4.11, duty bearers with malnourished children (N=14) consumed an average of 5.50 tins of alcoholic beverage while those with normal children (N=70) consumed an average of 5.24 tins. Independent sample *t*-test was used to determine the relationship between amount of alcohol consumed in the last seven days prior to data collection and effect on children's nutritional status. Results show that the mean difference (0.26) was not statistically significant [*t*-test=*p* 0.830; C.I. -2.177 – 2.706; *p*>0.05]. This implies that a child is at risk of malnutrition whether or not their caregiver abuses alcohol.

Table 4.11: Alcohol Consumption by Household Head and Children's Nutritional Status

	Children's Status (N=84)		Mean Litres Per Week
	Alcohol Consuming Household Head	Malnourished	14
	Normal	70	5.24

To further determine whether or not alcohol consumption had an influence on the nutritional status of children, several independent sample *t*-tests were conducted. Results indicated that the means between the groups were not significantly different. Further χ^2 for difference was not statistically significant. As shown in Table 4.12, analysis for GAM (16.9% Alcohol Consumers and 16.9% Non-Alcoholics) yielded [$\chi^2=0.97$; *p*>0.05] For Underweight, [$\chi^2=0.45$; *p*>0.05] (38.5% Alcohol Consumers and 33% Non-Alcoholics) while for Stunting (36.7% Alcohol Consumers and 29.1% Non-Alcoholics) [$\chi^2=0.309$; *p*>0.05]. None of these tests were statistically significant.

Table 4.12: Malnutrition by Gender of HHH and Alcohol Status

HH Characteristics(N=170)	Wasting (N=28)	Stunting (N=52)	Underweight (60)
With Alcohol consumption	17	36.7	38.5
No Alcohol Consumption	16.8	29.1	33
Male Consumption	11	23	23
Female Consumption	3	6	9
Statistical Significance (p value)	0.97	0.309	0.45

4.5 Household Characteristics of the Study Population

In every kind of research the demographic and socio-economic background of the community under study must be established. The researcher applied the same for Ol'lessos division. Table 4.13 shows some selected general characteristics of the study population.

There were a total of 876 persons in the 170 households studied. Of these, slightly more than half were women. Forty nine per cent (427) were male, 51.3% (449) were female and 25.7% (225) were children under five years of age. About fifty percent (100) boys and 49.7% (99) girls fitted the study. The mean household size was 5.2 members (see Figure 4.13).

Table 4.13: Selected General Demographic Characteristics of the Study Population

Sex of Household Member	Alcoholics (%)	Non-alcoholics (%)
Male (N=427)	15.9	84.1
Female (N=449)	6.9	93.1
Male Headed Households (N=141)	44.7	55.3
Female Headed Households (N=29)	72.4	27.6
Marital Status of Household Head		
Married (N=139)	47.1	53.2
Single (N=11)	81.8	18.2
Separated (N=5)	40	60
Divorced (N=3)	-	100
Widow (er)(N=12)	75	25
Under Five Years of Age (N=225)	25.7	
Boys under Study (N=100)	50.3	
Girls under Study (N=99)	49.7	
Mean Household Size	5.2	
Mean Age of Household Head	33 years	
Mortality Rate	1.84 (95% CI 0.63 – 5.27) children out of 10,000 per day.	

4.5.1 Marital Status of Household Heads in the Study Population

Marital status was categorized into five groups (i.e., married, single, separated, divorced and widowed). Majority of household heads (81.8%) in the study population were married. As shown in Figure 3, of those who were married, 47% were alcohol consumers while 53% were non-alcohol consumers. About four percent of household heads were single. Of those who were single, 81.8% were alcohol consumers while 18.2% were non-alcohol consumers. Five percent of household heads were separated. Of those who were separated, 40% were alcohol consumers while 60% were non-alcohol consumers. About two percent of household heads were divorced. Of those who were divorced, none were alcohol consumers. About seven percent of household

heads were widowed. Of those who were widowed, 75% were alcohol consumers while 25% were non-alcohol consumers.

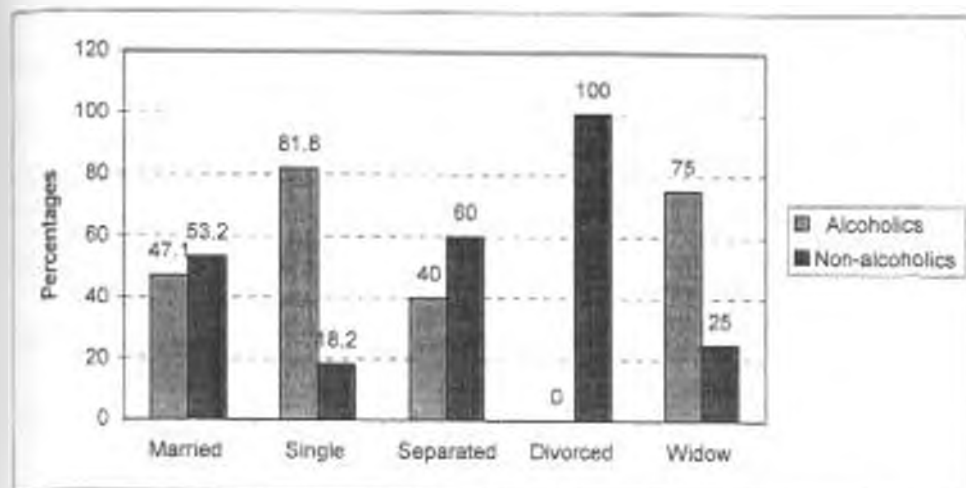


Figure 8: Distribution of Study Household Heads by Marital Status

Where household heads consume alcohol as demonstrated in the data aforementioned, resources are diverted to buying the alcohol instead of food. Malnutrition in children sets in. In addition, character and behaviour is difficult to control. Separation and divorce become apparent. Malnutrition of children sets in because one parent may not satisfactorily meet the needs of the growing child. Addiction to alcohol could result in death leaving children uncared for and subsequently malnourished.

4.5.2 Distribution of Children by Age and Sex

From the data shown in Table 4.14, the distribution trend of children is highest at 30-41 and the ratio is equal. The ratio of boys to girls is high at the age 54-59 months.

Table 4.14: Distribution of Children by Age and Sex

	Boys (N=100)%	Girls (N=99)%	Total (N=199)%	Ratio Boy: girl
6-17 Months	45.3	54.7	26.6	0:8
18-29 Months	47.5	52.5	20.1	0:9
30-41 Months	50.0	50.0	29.1	1:1
42-53 Months	57.1	42.9	21.1	1.3
54-59 Months	66.7	33.3	3.0	2.0

These results imply that at this age (54-59 Months) the boys are safer than girls in terms of being vulnerable to diseases and death in general. The ratio of 1:1 at the age of 30-41 months implies that the chances of child survival for both boys and girls at this stage are equal.

4.5.3 Level of Education in the Study Population by Sex

Figure 9 shows that 3.9% of males and 4% of females in the study population had tertiary education (college and university), 49.9% male and 51.7% female had only primary school education and about 34.4% male and 32% female had no education.

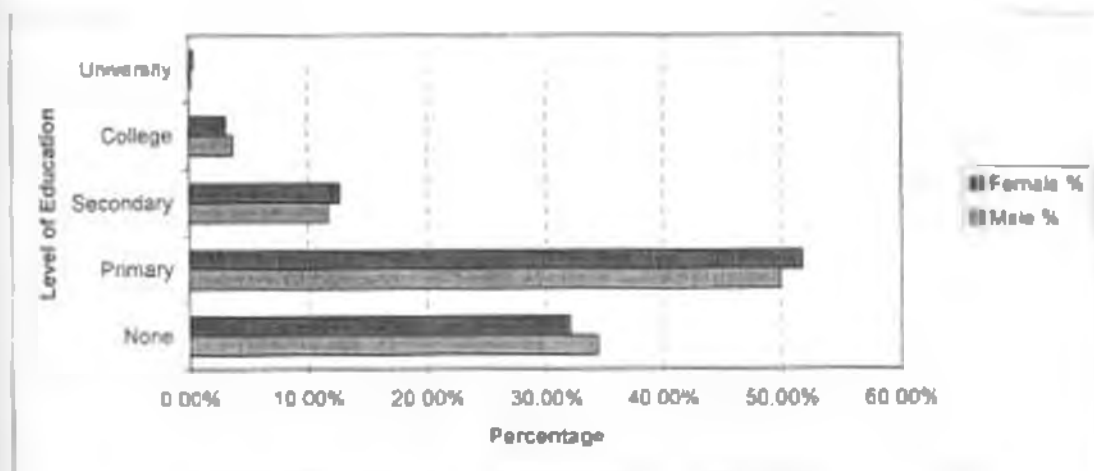


Figure 9: Level of Education in the Study Population by Sex

Findings on the education level in the study population imply that many participants had low levels of education (i.e., the highest level was primary school education).

4.5.4 Household Heads by Gender, Education Level and Alcohol Status

As shown in Table 4.15, there were more male-headed (82.9%) than female-headed (17.1%) households. This difference was statistically significant [$\chi^2 = 0.000$; $p < 0.05$]. The majority of the household heads have attained primary education and below (96 out of 141 males; 20 out of 29 females). In other words, two-thirds of household heads have low levels of education. The majority of household heads who consume alcohol have attained primary education and below (44 out of 63 males; 17 out of 21 females). In other words, two-thirds of household heads with low levels of education consume alcohol.

Table 4.15: Household Heads Gender and Education

Level of education	Male N=141(82.9%)		Female N=29(17.1%)	
	Alcoholic (N=63)%	Non-alcoholic (N=78)%	Alcoholic (N=21)%	Non-alcoholic (N=8)%
None	12.7	3.8	23.8	12.5
Primary	57.1	62.8	57.1	25.0
Secondary	27.0	23.1	19.0	50.0
College	3.2	9.0	0	0
University	0	0	0	12.5

Previous research (e.g., Khandare et al (2008); Macro International Inc 2008) shows that level of education of the caregiver influences nutritional status of the child in the household. In Ol'lessos, two-thirds of household heads have low levels of education. A logical conclusion is the existence of a link between level of education of the household heads in Ol'lessos and nutritional status of their children.

4.6 Socio-Economic Status of Households

Whether or not one owned a house, the type of housing, land acreage, occupation and

expenditure on food per month were factors used in this study to gauge households' socio-economic status.

4.6.1 Type of Housing and Alcohol Status of Household Heads

Type of housing was important to the present research study in that it portrayed levels of wealth or poverty in the household. The difference between type of housing and alcohol status of household heads was statistically significant [$\chi^2 = 0.020$; $p < 0.05$]. As illustrated further in Figure 10, more household heads that consume alcohol (53.1%) had temporary houses (thatched roof, mud walls and mud floor) compared to non-alcohol consuming household heads (46.9%). Conversely, more non-alcohol consuming household heads (72%) had permanent houses (iron roof, stone/brick walls and concrete floor) compared to household heads that consume alcohol (28%).

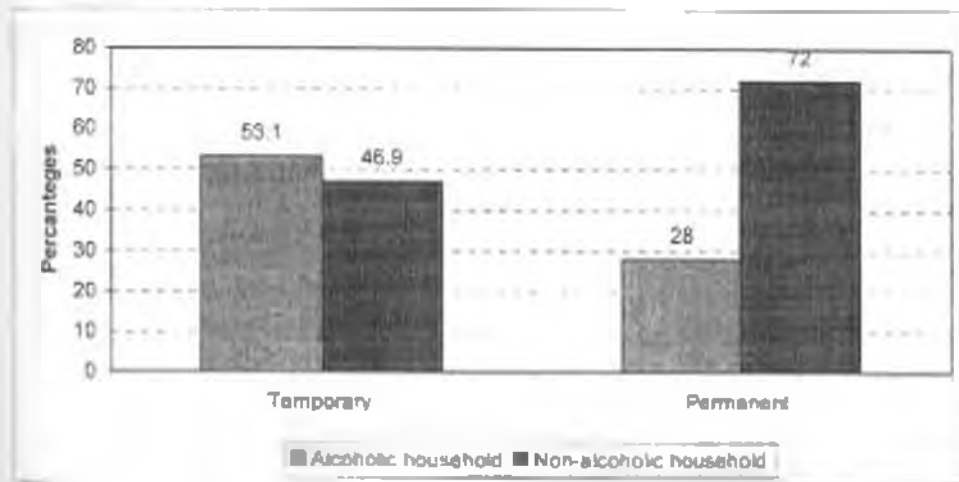


Figure 10: House Type by Alcohol Status

From the results above, many households in O'lessos had temporary type of housing depicting their socio-economic status. In other words, temporary housing is associated with high levels of poverty, a critical underlying factor of malnutrition (see Figure 10). When this situation

is combined with alcohol consumption within households, there are important implications on the nutritional status of those households, especially on children under five years of age as shall be demonstrated below.

4.6.2 Type of House and Malnutrition

In temporary type of housing, 4.2% of children were found to be severely malnourished and 9.6% moderately malnourished, while in permanent type of housing only 0.6% were severely malnourished and 2.4% were moderately malnourished. In other words the poorer the quality of housing, the higher the malnutrition and vice versa. Previous research (e.g., Hong (2006); Khandare et al (2008)) indicates that poverty (indicated by factors such as type of housing) contributes greatly to malnutrition. Findings from the present study confirm that there is indeed a relationship between type of housing and malnutrition [$\chi^2 = 0.002$; $p < 0.05$].

Table 4.16: Type of Housing and General Malnutrition

	Temporary (N=142)%	Permanent (N=25)%	Significance Level
Severe	4.2	0.6	.020
Moderate	9.6	2.4	.033
Normal	71.3	12.0	
Total	85.0	15.0	$\{\chi^2 = 0.002; p < 0.05\}$

4.6.3 Land Ownership

In Ol'lessos, land is very valuable because the main source of income is farming. From Table 4.8, 87.1% (148 out of 170) households owned land while 12.9% (22) did not have any. About seventy eight percent households had less than three acres, while 19.6% had between four and ten acres and 2.0% had between 11 and 50 acres. More household heads who consume

alcohol owned land (50.7%) compared to non-alcohol consuming households (49.3%). This shows that many households do not have enough land to cultivate food for sale and for subsistence purposes. From the same table and figure, malnutrition levels are highest in households with no land (33.3%) compared to those in households with land (14.4%). This difference was statistically significant [$\chi^2=0.03$; $p<0.05$].

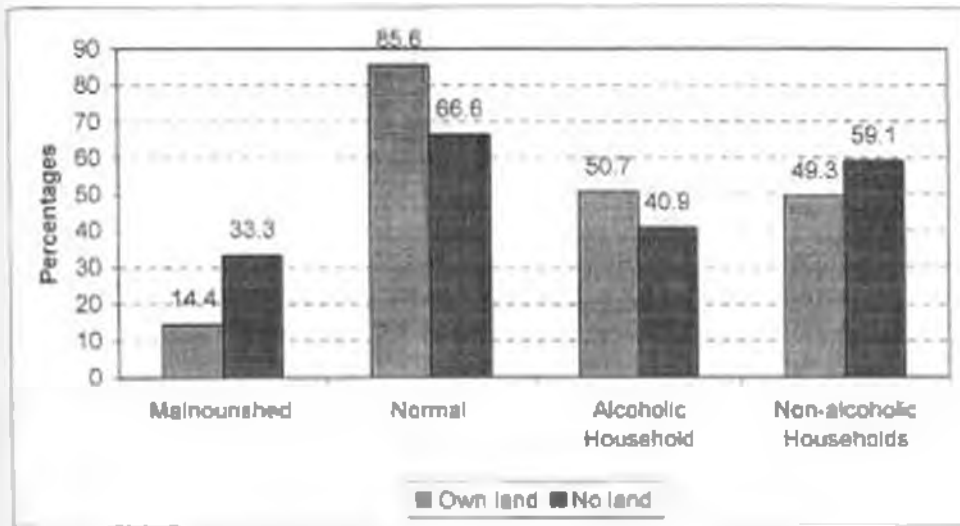


Figure 11: Land Ownership versus Malnutrition and Alcoholism

Without land there is no cultivation. This means food security is compromised. The end product is, more often than not, malnutrition experienced in households. The most affected are often children under five years of age

4.6.4 Sources of Income

Income is very important as it determines the well being of a household. Sufficient income sustains a household and minimizes the likelihood of malnutrition. From Figure 12, the main source of income in households in Ol'lessus was farming (64.1%). Few people (18.2%)

did business or earned a salary [from civil service or casual labour] (17.6%). Households that earned a salary had the highest percentage of alcoholics (53.3%), while (50.5%) farming and the rest (41.9%) were practicing business. Interestingly also, the highest percentage of malnutrition (18.3%) was from those households that practiced farming.

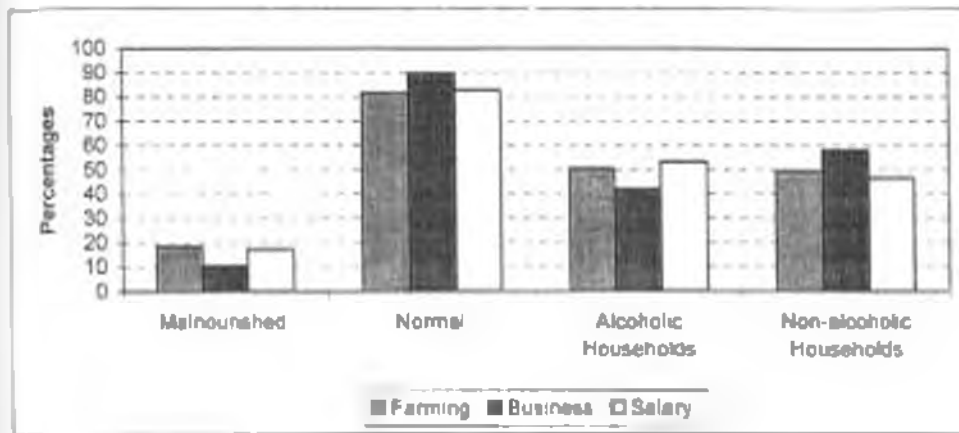


Figure 12: Sources of Income versus Malnutrition and Alcoholism

As aforementioned in the previous section, many households had less than three acres of land. This land is too small to yield much produce for sale and for subsistence. Consequently, very little income can be generated from farming. Neither can it be saved from earnings because resources get diverted to alcohol consumption. It is thus not surprising that malnutrition is an obvious outcome of such households.

4.7 Summary of Key Findings

This chapter presented key findings from the study on the impact of household heads' alcohol consumption on the nutritional status of children under five years of age in Ol'lessos division, Nandi district, Kenya. The key findings indicate that there are many factors that affect the nutritional status of children in Ol'lessos. Alcohol consumption was shown to have an effect

on the children's nutritional status. However, there were other immediate and underlying factors that affected the nutritional status of these children, including dietary diversity, child morbidity, and household heads' level of education, type of housing and ownership of land and the size of the land owned. The results of the present study correspond with those cited in previous research, which states that malnutrition is the outcome of diverse and interrelated factors, which may operate singly or in combination (UNICEF, 1990, 1992).

CHAPTER 5: DISCUSSION

5.1 Nutritional Status of Children Under Five years

GAM results showed that boys were at a higher risk of malnutrition than girls, consistent with literature globally. High percentages of wasted, stunted and underweight children are from alcohol consuming households due to negligence. High percentage of male child was malnourished compared to the girl child. According to this research, factors that contributed to the high percentages of malnutrition were low dietary diversity, alcoholism, literacy levels and poverty among others.

5.2 Household Dietary Diversity

Alcohol consumers often abdicate their responsibilities. That was the case in Ol'lessos Division as most of the alcohol consuming households consumed less than four food types implying they did not vary their diet as much. This resulted to high percentage of malnutrition in the area. Findings of the present study on household dietary diversity are consistent with those in Khandarc et al.'s (2008) rapid survey, where dietary intake was cited as a contributory factor to the malnutrition of children (N.B. in the conceptual model it is one of the two immediate causes of malnutrition).

5.3 Morbidity

Alcoholic caregivers often abdicate their duties of caring and providing for their children's basic needs. In the case of Ol'lessos, high morbidity levels are from alcohol consuming households. Infant and child morbidity is a sensitive indicator of changes in the health status and food availability (MPND, 2002-2008).

Malnutrition compromises child health, making children susceptible to illness and death.

Malnutrition in under-fives was found to be strongly associated with morbidity patterns (CBS, 1994). Consistent with previous research (e.g., Gupta, Gehr and Stettler, 2007; UNICEF 1998), the main diseases affecting children in the research site included coughing, diarrhoea and malaria. This research thus supports the continued concern for the health and general well being of the under fives.

5.4 Alcohol and Alcohol-Related Issues

Results indicated that some household heads abused alcohol (i.e., took more than three litres of alcohol per week). Though the amount of alcohol consumed, according to statistical analyses, makes no difference with the nutritional status of children, male-headed alcohol-consuming households have the highest percentage of malnourished children. Many of these alcohol consumers consumed busaa, which represents the highest portion of alcohol use in Sub-Saharan Africa (NACADA, 2006). Most of the malnourished children are from households where consumption occurs in the afternoon and evening. There are cases of spousal abuse, domestic violence and violation of human rights, which contribute to malnutrition.

5.5 Relationship between Alcohol Consumption and Nutritional Status of Children

In this study, alcohol consumption and neglect affect the most vulnerable members of the household, children. Chi-Square analysis on the relationship between alcohol consumption and dietary diversity were statistically significant ($p = 0.012$). However, though all other tests on relationship between alcohol consumption and children's nutritional status were not statistically significant, it is clear that high percentages of wasted, stunted and underweight children are from alcohol consuming households. In the African context, male is considered the head and provider of the family. If the male abdicates their responsibility and gets lost in alcohol consumption then the children are susceptible to malnutrition due to the caregiver's irresponsible behaviour.

It is further evident that male-headed alcohol consuming households have the highest percentage of malnourished children. As explained elsewhere in this study, most of the malnourished children are from households where alcohol consumption occurs in the afternoon and evening. This is attributed to the unrest in the household due to the actions of the alcoholic after consuming alcohol, which includes beating dependents and chasing them around or out of the house. Independent sample *t*-test was used to determine the relationship between amount of alcohol consumed in the last seven days prior to data collection and effect on children's nutritional status. Results show that the mean difference was not statistically significant. This implies that a child is at risk of malnutrition whether or not their caregiver abuses alcohol. Contributing factors to high percentages of malnutrition in Ol'lessos were confounding factors such as poverty, illness, level of education and gender of the consumer that were associated with alcohol consumption.

5.6 Demographic and Socio-Economic Characteristics

The proportion of females is higher than males in the study population, in line with the general trend worldwide. The proportion of female-headed households in the study was 17.1% (mostly alcohol consumers) compared to 23% reported for Nandi district (NDDP 2002-2008). High percentages of alcohol consuming household heads were single or widowed. This implies care for the children is single-handed, a factor that contributes to malnutrition. Gender difference is a contributing factor to malnutrition given that males are considered breadwinners in the household studied yet they are the ones with the highest percentage of alcohol consumption.

The main source of income for households in the present study was farming, but surprisingly the practicing households had the highest percentage of malnourished children. The small acreage of land has implications on income and nutritional status of the whole household.

High percentage of households in the community had semi-permanent houses (iron sheet roofing and mud walls); most of them were of alcohol consuming households. This type of housing implies that poverty levels are higher and the higher they are the higher the malnutrition levels are too.

Household heads had low levels of education that contributed to alcoholism and malnutrition. Caregiver education negatively contributes to children's nutritional status. In one study (Macro International Inc., 2008) maternal education had an inverse relationship with stunting and wasting. As the level of maternal education increased, the level of stunting, wasting, and underweight decreased. Another study (CBS, 1994) found a strong association between malnutrition and female illiteracy.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The results from this study show that:

- Nutritional status of children under five years of age in households is poor. Socio-economic factors e.g. poverty, illness, and level of education and gender of the consumer are statistically significant with this fact.
- Dietary diversity among children under five years of age in households is not to the recommended standard and therefore contributes to significant malnutrition among children.
- Levels of alcohol consumption among household heads are high with the ratio of males being on the higher side.
- Morbidity among children under five years of age in households is high and mostly from alcohol consuming households.
- The relationship between alcohol consumption and the nutritional status of children under five years of age in households is not statistically significant, but there are many confounding factors. e.g. poverty, illness, and level of education and gender of the consumer that contributes significantly to children's nutritional status.

6.2 Recommendations

The study makes the following recommendations:

- Dietary diversity is a key indicator to nutritional status; therefore, the health workers should educate the community on the importance of various food groups.
- The government, research institutions, non-governmental organizations and public and the private sector should put their resources together to establish the factors behind high level of alcohol consumption (alcohol abuse).
- Research institutions can replicate the present study with larger sample sizes in the same or different area using stratification method of sampling.

REFERENCES

- (CBS) [Kenya] (2009). Ministry of Health (MoH) [Kenya] and ORC Macro Kenya Demographic and Health Survey 2008. [Preliminary Report] Calverton, Maryland: CBS, MoH and ORC Macro, pp. 27-39
- CBS (2001). Population distribution by administrative areas in urban centres Kenya. 1999 population and housing census. Nairobi. CBS (Ministry of Finance and Planning), pp. 14-25.
- FAO (2001). The state of food security in the planning world Rome: IAO, pp 3-11, 45
- Fischer, A. A., Laing, J.A., & Townsend, J.W. (1991). Handbook for family planning operation research. USA: Population Council, pp. 40-46.
- Government of Kenya (2002). Second report on poverty in Kenya. Poverty and Social Indicators. Nairobi. Ministry of Finance and Planning, p.7
- Groeneveld, I. F., Solomons, N. W., & Doak, C.M. (2007). Nutritional status of urban schoolchildren of high and low socioeconomic status in Quetzaltenango, Guatemala. *Rev Panam Salud Publica*, 22(3): pp. 169-77.
- Gupta, N., Gehr, M., & Stettler, N. (2007). Early introduction of water and complementary feeding and nutritional status of children in northern Senegal. *Public Health Nutrition*: 10(11). pp. 1299-1304.
- Hong, R. (2006). Effect of economic inequality on chronic childhood under nutrition in Ghana. *Public Health Nutrition*: 10(4). pp. 371-378.
- Khandare, A.L., Siruguri, V., Rao, A., Venkaiash, K., Reddy, G., & Rao, G.S. (2008). Diet and Nutrition Status of Children in Four Tribal Blocks of Thane District of Maharashtra, India (Nutrition Status of Children). *Pakistan Journal of Nutrition* 7 (3). pp 485-488.
- Kigotho, W. (2009, October 17). Report paints sad picture of effects of severe malnutrition on learners. *The Standard(Kenyan news paper)* , p. 10 col. 2-5.
- Koross, K. (2009, October 16). 5m children in Africa starving. *Daily Nation (Kenyan news paper)*, p 8, col.1 - 2.
- Masha, J. (2009, October 16). Diarrhoea leading cause of child death, says Mugo. *The Standard (Kenyan news paper)*, p 4 col. 2-3.
- Ministry of Planning and National Development. (1994) Fifth Nutrition Survey. Nairobi: Government Press, p.23

Ministry of Planning and National Development. (2002 -2008). Nandi District development plan: Effective management for sustainable economic growth and poverty reduction. Nairobi: Government Press, p. 7-22.

National Agency for the Campaign Against Drug Abuse (NACADA). (2004). Youth in peril: Alcohol and drug abuse. Nairobi: NACADA, p.2.

National Agency for the Campaign Against Drug Abuse (NACADA). (2006). Frequently asked questions on Drugs and Substance Abuse (Community area) Nairobi: NACADA, p.1-2

National Agency for the Campaign Against Drug Abuse (NACADA). (2007). Rapid situation assessment of drugs and substance abuse in Kenya: Draft report Nairobi: NACADA, p4

National Agency for the Campaign Against Drug Abuse (NACADA) (2009). The National Alcohol Policy. Nairobi: Sunday Nation Newspaper, May 24 2009. Pg.5, column 1

Nyassy, D., and Ndurya, M. (2009,). "How Kenya's 'lost generation' threatens to bring the economy to its knees: Hope returns to 'village of zombies'" Sunday Nation (*Kenyan news paper*) March 4 2009 (Society), p 4, col 1 – 4.

Rao, N. K., Begum, S., Venkataramana, I. V., & Gangadharappa, N. (2001). Nutritional neglect and physical abuse in children of alcoholics. *Indian Journal of Paediatrics*, Volume 68—September. pp.5-16.

Rutherford, D. (2009). *The Globe*. Issue 1. London: The Institute of Alcohol Studies for The Global Alcohol Policy Alliance, pp. 2-20.

Swindale, A., & Blinsky, P. (2006). Household Dietary Diversity Score (HDDS) for measurement of household food access: Indicator Guide. version 2. Food and Nutrition Technical Assistance Project. Academy for Educational Development Washington DC 2009-5721.

The Sunday Nation Team. (2009). "How Kenya's 'lost generation' threatens to bring the economy to its knees: Drunken young men turn homes into a living hell for parents, wives and children." Sunday Nation (*Kenyan news paper*), March 4 2009 (Society), p. 4, col. 1 – 4

Turney (2007). Victims of family alcoholism: The lasting effects on spouse and children. PHP CMS inspired web publisher, p 26

United Nations Office on Drugs and Crime (UNODC) (2008). Perspectives on synthetic drugs. Oxford: Oxford University Press, UK, p 5.

UNICEF (2006). State of the world's children UNICEF, New York, p.11.

UNICEF. (1990). Strategy for improving nutrition of children and women in developing countries. Oxford University Press, UK, p 53

UNICEF. (1998). The state of the world children. Oxford and New York. pp 7- 35.

UNICEF/WHO (1999). Nutrition essentials a guide to health manager's. Oxford University Press, UK, pp.140-142.

WHO (1997). Health and environment in sustainable development: 5 years after the Summit. Geneva. World Health Organization. (WHO/EHG/97.8), p.6

APPENDICES

Appendix 1: Questionnaire

Questionnaire No. _____

UNIVERSITY OF NAIROBI

DEPARTMENT OF FOOD SCIENCE, NUTRITION, AND TECHNOLOGY

APPLIED HUMAN NUTRITION PROGRAMME

CONSENT FORM

Dear _____.

Jelimo Saina, a student at the University of Nairobi, is undertaking a study entitled: *Nutritional Status of Children under Five Years of Age*. In order to get information on the topic, we are conducting a survey in this village and your household has been selected by chance from all households in this area

This form is to invite you to participate in the study. The information you provide will be useful in finding the nutritional status of children in this community. A copy of this report will be submitted to your community leaders who may use it for planning of development projects in this area

All information you give will be confidential. The information will be used to prepare general report but will not include any specific name. We encourage you to participate in this study and your cooperation will be highly appreciated.

Please sign below to indicate your consent to participate in the study.

Name: _____

Signature: _____

Date: _____

UNIVERSITY OF NAIROBI

DEPARTMENT OF FOOD SCIENCE NUTRITION AND TECHNOLOGY, APPLIED
HUMAN NUTRITION PROGRAMME

A study on nutritional status of children 6 to 59 months

General Information

Team Number: _____

Interviewer: _____

Location: _____

Sub-location: _____

Name of the village: _____

Household No.: _____

Name of HH head: _____

Name of Respondent: _____

Date of interview:

1. Household Characteristics

Name	Sex	Age	RHHH	Marital Status	Education	Occupation	Contribution to HH	Religion	Uses Alcohol
	1=Male 2=Female		1=Husband 2=Wife 3=daughter 4=Son 5=GrdChild 6=Hschelp 7=sister 8=Brother 9=Parent 10=Others	1=Single 2=Married 3=Divorced 4=Widowed 5=Separated 6=N/A	1=None 2=Prim 3=Sec 4=College 5=Univ	1=Farmer 2=Business 3=Civil ser 4=Others	0=Nothing 1=Money 2=Labour 3=Childcare	1=xtian 2=Islam 3=Others	1=Yes 2= No

2. What is the household main source of livelihood? 1=Farming 2=Business 3=Borrowing
4=others (specify)

Socio-Economic Status of Households

Housing

3. Do you own a house? 1=Yes 2=No

Observations

4. Type of house? 1=Temporary 2=Permanent

5. Type of roofing material? 1=Thatched 2=Iron sheet 3=Tiled

4=others (specify)

6. Type of wall? 1=Mud 2=Wooden 3=Iron sheet 4=concrete 5=Hardboard

6= Stone 7=others (specify)

7. Type of floor? 1=Mud 2=Wooden 3=Concrete 4=Others (Specify)

Land

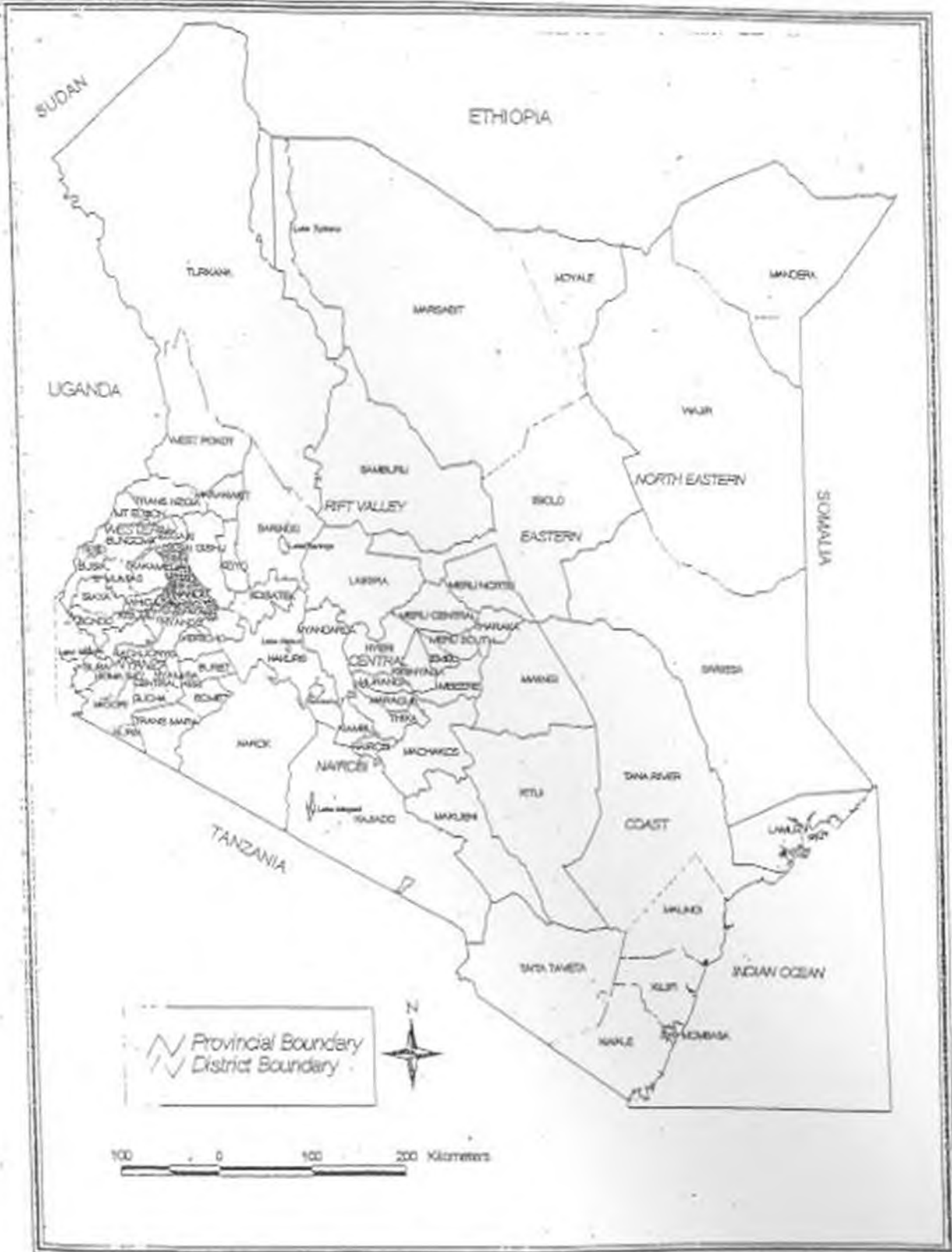
8. Do you own land? 1=Yes 2=No

9. If yes how many acres?

Income and expenditure

10. How much do you spend on food per month?

Appendix 4: Nandi District



Prepared by CBS, 1968 Pop. Census

This map is not an authority over administrative boundaries

25. Household Food Consumption & Dietary Diversity

Twenty four-hour recall for food consumption in the households: The interviewers should establish whether the previous day and night was usual or normal for the households. If unusual- feasts, funerals or most members absent, then another day should be selected.

Food group consumed: What foods groups did members of the household consume in the past 24 hours (from this time yesterday to now)? Include any snacks consumed.	Did a member of your household consume food from any these food groups in the last 24 hours? 1=Yes 0= No
Type of food	
Cereals and cereal products (e.g. maize, spaghetti, rice, bread)?	
Milk and milk products (e.g. goat/cow fermented milk, milk powder)?	
Sugar and honey?	
Oils/fats (e.g. cooking fat or oil, butter, ghee, margarine)?	
Meat, poultry, offal (e.g. goat, beef; chicken or their products)?	
Pulses/legumes, nuts (e.g. beans, lentils, green grams, cowpeas; peanut)?	
Vegetables (e.g. green or leafy vegetables, tomatoes, carrots, onions)?	
Fruits (e.g. water melons, mangoes, grapes, bananas, lemon)?	
Eggs?	
Fish and sea foods (e.g. fried/boiled/roasted fish, lobsters)?	
Miscellaneous (e.g. spices, chocolates, sweets, beverages, etc)?	

26. 24 Hour Dietary Recall for the Household and the Child aged 6-59 Months

Dish										Final expression				
Time	Description of dish	Total amount	Dish code	Description of ingredient	Amount used (ml)	Unit	Size	Ingredient code	Amount Served (ml)	Plate waste (ml)	Amount Consumed (ml)	Weight of ingredients		
												g	g-waste	Amount consumed

Alcohol Status of Care Giver(s)/ Duty Bearer(s)

27. Do you consume alcohol? 1= Yes 2=No

If yes, fill the following table

Sex	Age in years	Q28 Type of Alcohol	Q29 Container Tin/Bottle used	Q30 Quantity (i.e how many Containers/Tins/Bottles Consumed in a day?)	Q31 How many days in the week?	Q32 Time of consumption	Q33 Consumption/Amount consumed in the past seven days)
1= Male		1=Busan 2=Chang'aa 3=Beer 4=Spuris 5=Wine 6=Others (Specify)	1=Large (1 ltr) 2=Small (500ml) 3=Others (Specify)			1=Morning (before 2pm) 2=Afternoon (between 2-6pm) 3=Evening (after 6pm)	
2= Female							

34. Do you [does your spouse] do any of the following as a result of alcohol consumption?

1=Beat Wife 2=Beat Husband 3=Beat

Children 4=Chase Away Everybody in the House 5=Calm 6=Others

35. Have you ever found alcohol consumption a problem to you? 1=Yes 2=No

36. If yes have you ever sort help to overcome your problem? 1=Yes 2=No

37. If yes what type of help? 1=Rehabilitation 2=Counselling 3= Others

38. According to you, what is the effect of alcohol consumption on the health of children in this household? 1=Good 2=Bad 3=No effect 4= others (Specify)

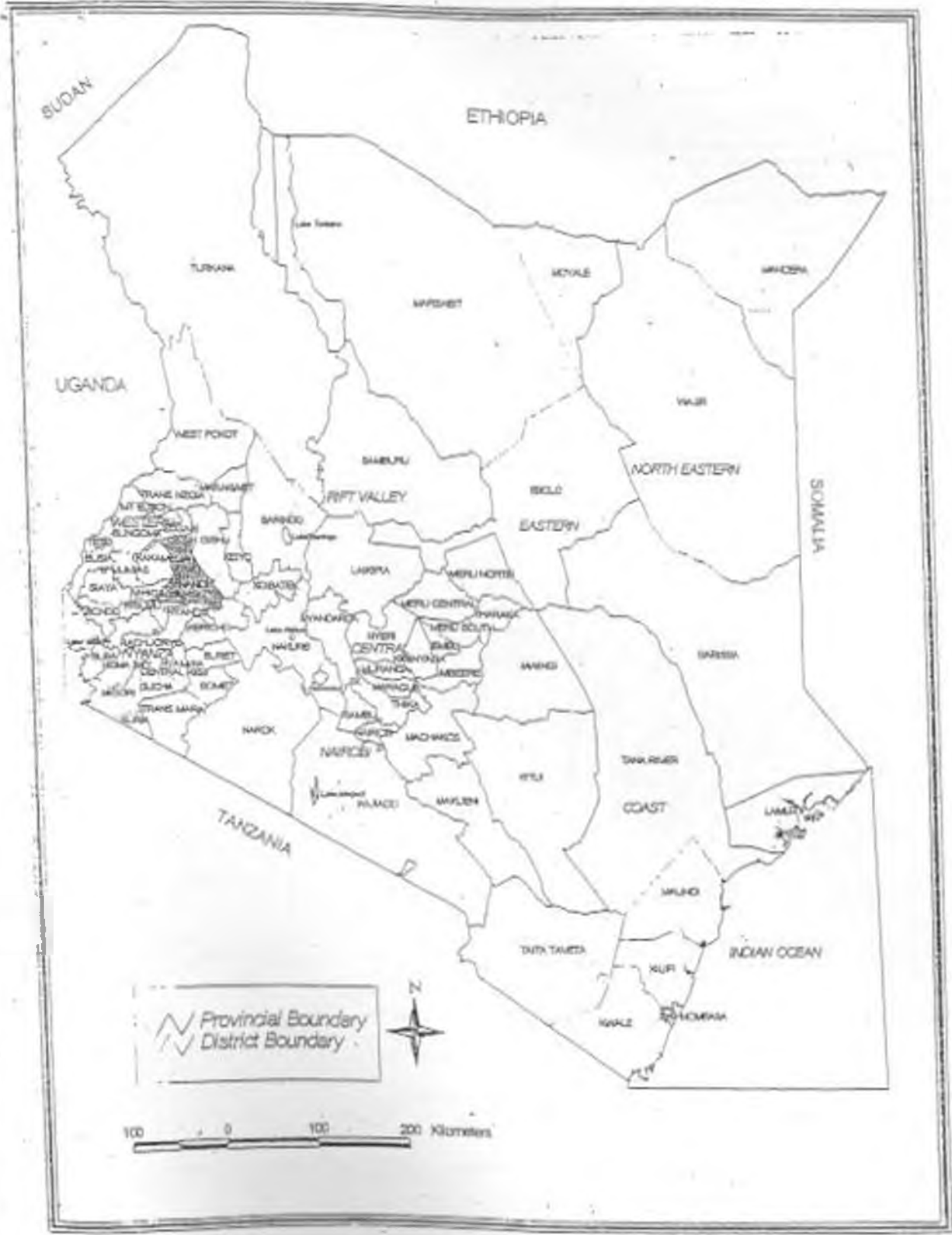
Appendix 2: Focus Group Discussion Guide

- 1 What are your thoughts on the nutritional status of children in this community? (Probe for factors, characteristics, solutions).
- 2 What are your thoughts on alcoholism in this community? (Probe for factors, characteristics, intensity levels, solutions).
- 3 What are your thoughts on the impact(s) of alcoholism on the nutritional status of children in this community? (Probe for associations with malnutrition)
- 4 Other comments, suggestions, recommendations?

Appendix 3: Research Assistant Training Curriculum/Content

Day	Time	Subject matter	Learning method	Learning aid
1	8.30-9.00 am	Introduction to the research proposal and objectives of the research	Lecture	Flip chart
	9.00-10.00 am	Creating rapport and general ethics	Brain storming, Discussion,	
	10.00-10.30 am	Break		
	10.30-12.30 pm	Administration of the questionnaire	Lecture	Sample of the questionnaire
	12.30-1.30 pm	Anthropometry measurements	Practical, Demos & Role Play	Anthropometry tools, Equipments & Pictures
	1.30-2.00 pm	Lunch		
	2.00-3.30 pm	24hour recall	Practical, Demos & Role Play	Equipments for weighing & measuring
	3.30-4.00 pm	Interviewing techniques and Question time	Role play	Sample of a questionnaire
4.00	Tea and depart			
2	8.30-9.00 am	Refresh	Brain storming	Flip chart
	9.00am-1.00 pm	Pre-test the questionnaire	Practical	Field
	1.00-2.00 pm	Take Lunch		
	2.00-3.00pm	Feedback	Discussion	Filled questionnaire
	3.00 pm	Disperse		

Appendix 4: Nandi District



Prepared by CBS, 1988 Pop. Census

Map showing the administrative boundaries of the Nandi District

