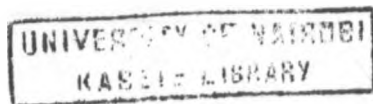


**CHILDCARE PRACTICES AND PSYCHOMOTOR
DEVELOPMENT IN CHILDREN 0-36 MONTHS IN MWEA
DIVISION-KIRINYAGA DISTRICT-KENYA**

BY

**MURIUKI ROSE WANJIKU
(B.Ed. HOME ECONOMICS)**



**A DISSERTATION SUBMITTED TO THE BOARD OF POSTGRADUATE STUDIES,
UNIVERSITY OF NAIROBI IN PARTIAL FULFILLMENT OF THE REQUIREMENT
FOR THE DEGREE OF MASTER OF SCIENCE IN APPLIED HUMAN NUTRITION**

University of NAIROBI Library

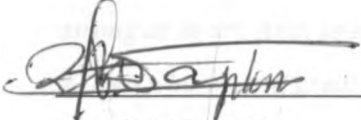


0524430 6

2005

DECLARATION

This is my original work and has not been presented for a degree in any other University.

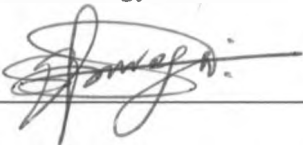


Rose W. Muriuki

AUGUST 26th 2005
Date

This dissertation has been submitted with my approval as a University supervisor.

Dr. Abiud A. Omwega
Dept. of Food Technology and Nutrition

Signed 

Date 12/9/05

DEDICATION

To my two children Victor Muhiri and Gillian Wangui who inspite of everything remained strong at heart. And, to my elderly father Joseph Muriuki and my beloved late sister Rosalind Kirigo who were a great source of inspiration, moral support and encouragement.

ACKNOWLEDGEMENT

I wish to acknowledge most sincerely the individuals and institutions, which contributed to the successful completion of this project.

Special thanks go to the department of Food Science and Nutrition staff particularly Professor E.G. Karuri for considering and forwarding my needy case and the subsequent award of University of Nairobi scholarship. I will forever remain indebted to you.

Special thanks too to my supervisor Dr. Abiud M.Omwega for his dedicated guidance and supervision throughout the undertaking of this project. I would not forget the late Professor Muroki, Professor Karuri and Mr.Obudho for their occasional guidance and encouragement in the analysis and compilation of this project.

Very special thanks to the Community Based Nutrition Programme who have contributed extensively on the fight against malnutrition especially in the disadvantaged rural areas. Their further concern on psychomotor conditions of children is an indication that their intention is not only physical health but mental health as well. I sincerely thank you for funding this project and giving me the honour to conduct it.

I am very grateful to Mr. Meme Muriithi (KU) for his invaluable help on E.C.D. Thanks to Alice and Jane of Family Life Training Center Wang'uru, who were of great assistance during the initial stages of the fieldwork. I cannot forget my field assistants Nyaga, Mary, Faith and Murimi who were very committed and worked tirelessly during data collection.

Special thanks too to Dr. Wambui Kogi Makau for pointing out and giving me guidance on the areas of correction not forgetting Dr. Mwangi for her commitment in ensuring the completion of this work.

Last but not least, my heartfelt appreciation to Ndirangu's family and my young widowed sister Mumbi for the sincere care, guidance and protection they accorded my children during the study period. May god bless you mightly.

Finally but overall, thanks to my almighty God who has strengthened me in times of great despair. It is his grace that has sustained me this far.

Thank you.

TABLE OF CONTENTS

PAGE

TITLE

DECLARATION	II
DEDICATION	III
ACKNOWLEDGEMENT.....	IV
TABLE OF CONTENTS	V
LIST OF TABLES.....	IX
LIST OF FIGURES.....	XII
ABBREVIATIONS.....	XIII
OPERATIONAL DEFINITIONS	XV
ABSTRACT	XVII
CHAPTER ONE.....	1
1.0 INTRODUCTION	1
1.1 BACKGROUND INFORMATION	1
1.2 STATEMENT OF THE PROBLEM	7
1.3 JUSTIFICATION	7
1.4 PURPOSE OF THE STUDY	8
1.5 OBJECTIVES	8
1.5.1 MAIN OBJECTIVE	8
1.6 RESEARCH QUESTIONS.....	9
1.7 BENEFITS OF THE STUDY	9
CHAPTER TWO.....	10
2.0 LITERATURE REVIEW	10
2.1 INTRODUCTION	10

2.2 THE NEED FOR ADEQUATE CARE IN BABYHOOD	12
2.3 KNOWLEDGE OF IMPORTANT CARE GIVING BEHAVIOURS	13
2.4 CARE GIVER TIME AVAILABILITY AND ALLOCATION FOR CHILD CARE	13
2.5 EFFECT OF KNOWLEDGE, BELIEFS, ATTITUDE AND EDUCATION LEVEL ON CAREGIVING	14
2.6 CAREGIVERS HEALTH	15
2.7 DIETARY CARE DURING ILLNESS	16
2.8 HYGIENE PRACTICES AND SANITARY CONDITIONS	16
2.9 IMPORTANCE OF BREASTFEEDING AND COMPLEMENTARY FEEDING.....	16
2.10 PSYCHOMOTOR DEVELOPMENT	18
2.10.1 <i>Motor Development</i>	18
2.10.2 <i>cognitive development</i>	19
2.11 ATTRIBUTES OF PSYCHOMOTOR DEVELOPMENT.....	21
2.12 INDICATORS OF PSYCHOMOTOR DEVELOPMENT	22
2.13 THE ALTERNATIVE CAREGIVERS	22
2.14 TIME-SAVING METHODS IN CHILDCARE.....	23
2.15 GAPS IN KNOWLEDGE.....	24
CHAPTER THREE.....	25
3.0 STUDY SITE.....	25
3.1 LOCATION AND POPULATION	25
3.3 MWEA IRRIGATION SETTLEMENT SCHEME	25
3.4 INFRASTRUCTURE	28
3.4.1 <i>Health Facilities</i>	28
3.4.2 <i>Education Facilities</i>	28
3.4.3 <i>Communication Network</i>	28
3.4.4 <i>Water Facilities</i>	29
CHAPTER FOUR	30
4.0 RESEARCH METHODOLOGY	30
4.1 STUDY DESIGN.....	30
4.2 PREPARATION FOR THE STUDY	30
4.3 TRAINING OF RESEARCH ASSISTANTS AND PRETESTING.....	30
4.3.1 <i>Pretesting</i>	31
4.7 SAMPLING PROCEDURE.....	32
4.8 DATA COLLECTION TOOLS	35
4.8.1 <i>Questionnaire</i>	35
4.8.2 <i>Procedure for Taking Anthropometric Measurement</i>	35

4.9	PHASE II OF DATA COLLECTION.....	38
4.10	FOCUS GROUP DISCUSSION.....	38
4.12	PROBLEMS ENCOUNTERED.....	39
4.1.3	DATA ANALYSIS.....	39
CHAPTER FIVE	41
5.0	RESULTS.....	41
5.1	SOCIAL DEMOGRAPHIC CHARACTERISTICS.....	41
5.2	CHARACTERISTICS OF WOMEN INTERVIEWED.....	41
5.2.1	<i>Marital Status</i>	41
5.2.2	<i>Age and Education</i>	41
5.2.3	<i>Occupation and Religion</i>	42
5.3	CHARACTERISTICS OF THE STUDY CHILDREN.....	42
5.4	MATERNAL ACTIVITIES.....	43
5.5	CHILDCARE ACTIVITIES.....	46
5.6	TIME SPENT ON CHILDCARE ACTIVITIES.....	47
5.7	PSYCHOMOTOR ENHANCING ACTIVITIES.....	50
5.8	ALTERNATIVE CAREGIVERS.....	56
5.9	TIME SAVING METHODS IN CHILDCARE.....	59
5.10	NUTRITIONAL STATUS.....	60
SUMMARY	63
CHAPTER SIX	66
	DISCUSSION.....	66
6.0	GENERAL CHARACTERISTICS.....	66
6.1	POPULATION AND SOCIAL DEMOGRAPHIC CHARACTERISTICS.....	66
6.2	MATERNAL ACTIVITIES.....	67
6.3	CHILDCARE ACTIVITIES.....	67
6.4	TIME ALLOCATION FOR CHILDCARE.....	68
6.5	TIME SAVING METHODS IN CHILDCARE.....	69
6.6	ALTERNATIVE CAREGIVERS.....	70
6.7	NUTRITIONAL STATUS.....	71
6.8	PSYCHOMOTOR DEVELOPMENT.....	71
CHAPTER 7	74
CONCLUSIONS AND RECOMMENDATIONS	74

RECOMMENDATIONS.....75

REFERENCES77

APPENDICES.....83

APPENDIX 1.....83

APPENDIX 2.....93

APPENDIX 3.....95

APPENDIX 4.....98

APPENDIX 5.....99

APPENDIX 6.....100

APPENDIX 7.....101

APPENDIX 8.....102

APPENDIX 9.....103

APPENDIX 10.....104

LIST OF TABLES

TABLE 1: DISTRIBUTION OF STUDY POPULATION BY SELECTED DEMOGRAPHIC CHARACTERISTICS.....	41
TABLE 2: DISTRIBUTION OF HOUSEHOLDS BY MATERNAL CHARACTERISTICS AND HOUSEHOLD HEAD.....	42
TABLE 3: DISTRIBUTION OF STUDY CHILDREN BY GENDER AND AGE	43
TABLE 4: DISTRIBUTION OF HOUSEHOLDS BY REPORTED AND OBSERVED MATERNAL ACTIVITIES BY AGE OF THE CHILD.....	44
TABLE 5: DISTRIBUTION OF OBSERVED (NOT REPORTED) MATERNAL ACTIVITIES BY AGE OF THE CHILD	45
TABLE 6: DISTRIBUTION OF REPORTED (NOT OBSERVED) MATERNAL ACTIVITIES BY AGE OF THE CHILD.....	45
TABLE 7: DISTRIBUTION OF HOUSEHOLDS BY REPORTED AND IMPORTANT CHILDCARE ACTIVITIES	46
TABLE 8: DISTRIBUTION OF CHILDCARE ACTIVITIES BY AGE OF THE CHILD	47
TABLE 9: DISTRIBUTION OF HOUSEHOLDS BY REPORTED MOST-TIME CONSUMING CHILDCARE ACTIVITIES	47
TABLE 10: DISTRIBUTION OF HOUSEHOLDS BY OBSERVED CHILDCARE ACTIVITIES BY MEAN TIME PER DAY	48
TABLE 11: DISTRIBUTION OF MEAN CHILDCARE TIME PER ACTIVITY PER DAY PER CHILD’S AGE	49
TABLE 12: DISTRIBUTION OF CHILDREN BY MILESTONE AGE OF ACHIEVEMENT.....	50
TABLE 13: DISTRIBUTION OF HOUSEHOLDS BY SUGGESTED AGE FOR PLAY IN YEARS	51
TABLE 14: DISTRIBUTION OF CHILDREN BY CONFINEMENT AND PSYCHOMOTOR ACHIEVEMENTS	52
TABLE 15: MATERNAL REASONS FOR NOT TEACHING SKILLS TO THEIR CHILDREN.....	53
TABLE 16: DISTRIBUTION OF THE 3-YEAR-OLD CHILDREN BY PSYCHOMOTOR ABILITIES.....	55
TABLE 17: DISTRIBUTION OF 3-YEAR-OLD CHILDREN’S PSYCHOMOTOR ACHIEVEMENTS BY NUTRITIONAL STATUS.	55
TABLE 18: DISTRIBUTION OF CHILDREN BY PSYCHOMOTOR RESPONSES ON TOYS.....	56
TABLE 19: DISTRIBUTION OF SELECTED CHARACTERISTICS OF THE ALTERNATIVE CAREGIVER	57

TABLE 20: DEVELOPMENTAL MILESTONE AND PRESENCE OR ABSENCE OF ALTERNATIVE CAREGIVER	58
TABLE 21: PERCENTAGE DISTRIBUTION OF DELAY RATE ON DEVELOPMENTAL MILESTONE BY VARIOUS CAREGIVERS	59
TABLE 22: DISTRIBUTION OF HOUSEHOLDS BY THE REPORTED TIME-SAVING METHODS IN SELECTED MATERNAL ACTIVITIES.	60
TABLE 23: DISTRIBUTION OF MALNOURISHED CHILDREN BY GENDER	61
TABLE 24: DISTRIBUTION OF MALNOURISHED CHILDREN BY AGE	61
TABLE 25: DISTRIBUTION OF MALNOURISHED CHILDREN BY SELECTED MATERNAL CHARACTERISTICS	62

LIST OF FIGURES

FIGURE 1.1: CONCEPTUAL FRAMEWORK FOR THE CAUSES OF MALNUTRITION AND DEATH	3
FIGURE 1.2. THE EXTENDED MODEL FOR CARE.....	5
FIGURE 4.0: SCHEMATIC REPRESENTATION OF THE SAMPLING PROCEDURE.....	34
FIGURE 5.1 DISTRIBUTION OF THE STUDY CHILDREN BY THE FREQUENCY OF PLAY	51
FIGURE 5.2: DISTRIBUTION OF STUDY CHILDREN'S ABILITY TO JUMP BY THE FREQUENCY OF TEACHING SKILLS.....	53
FIGURE 5.3: DISTRIBUTION OF STUDY CHILDREN BY THE FREQUENCY OF TEACHING SKILLS.....	54
FIGURE 5.4: DISTRIBUTIONS OF THE STUDY CHILDREN BY NUTRITIONAL STATUS BY CAREGIVER	63

ABBREVIATIONS

ACC/SCN	-	Administrative Committee on Co-ordination/Sub- Committee on Nutrition
ANP	-	Applied Nutrition Programme
ASAL	-	Arid and Semi-arid Lands
CBNP	-	Community Based Nutrition Programme
DANIDA	-	Danish International Development Agency.
ECC	-	Early Child Development
ECD	-	Early Child Development
EPI-Info	-	Word Processing, Database and Statistics for Public Software
FAO	-	Food and Agriculture Organization of the United Nations
FGD	-	Focus Group Discussion
FLTP	-	Family Life Training Programme
GAM	-	Global Acute Malnutrition
GSM	-	Global Stunting Malnutrition
GUM	-	Global Underweight Malnutrition
HAZ	-	Height - for -Age z- score
INCAP	-	Institution of Central America and Panama.
KDHS	-	Kenya Demographic Health Survey
KU	-	Kenyatta University
MCH	-	Maternal and Child Health
N.I.B	-	National Irrigation Board
NCHS	-	National Centre for Health Statistics
NCRSP	-	Nutrition Collaborative Research Support Programme.
NGO	-	Non-Governmental Organization
P-value	-	Probability value
SD	-	Standard Deviation
SPSS	-	Statistical Package for Social Scientists
TBA	-	Traditional Birth Attendant
UNESCO	-	United Nations Educational, Scientific and Cultural Organization
UNICEF	-	United Nations Children's Education Fund
UoN	-	University of Nairobi

- WAZ - Weight- for -Height z- score
- WHO - World Health Organization

OPERATIONAL DEFINITIONS

Care	Provision in the household and the community of time, attention and support to meet the physical, mental and social needs of a growing child.
Caregiver	A caregiver/caretaker in this study refers to any person providing care to the child
Caring Capacity	Potential to provide care.
Child development	A process of change in which a child learns how to handle even more complex levels of moving, thinking, feeling and relating to others.
Childcare	As used in this study refers to the routine activities performed for the child by either the mother or an alternative caregiver in the household e.g. washing of child's clothes, bathing, feeding, breastfeeding, teaching skills etc.
Gross motor skills	Involve movement of the large motor areas eg the head, body, hands and legs
Development	In the context of this study, it a process whereby a child gains even more advanced levels of motion, cognition and social skills,
Developmental Milestones	For the purposes of this study this is the period or stage at which achievements of physical, mental or behavioral change occur
Fine motor skills	Involve movement and coordination of the smaller motor areas including the hands, fingers, feet, toes, eyes and lips
Idle	In the context of this study, idle is taken to mean the period of time the caregiver was doing nothing particular.
Malnutrition	Defined as a state of nutrition where the height-for-age, weight-for-age and weight- for-height indices fall below -2 z-scores of the NCHS reference.
Motor	Means motion. In the context of the study can be defined as a child's growing ability to move his or her body in a purposeful, voluntary motion (includes fine and gross skills)

Play:	Is a non- serious activity engaged in for its own sake. It integrates activity, thought and language in the natural settings of the family neighborhood or pre-school. It enlarges the child's understanding of the world in which they live by allowing the child to explore objects, social roles, language and feelings with no much risk.
(Psycho/Cognitive)	In the context of this study can be defined as the development of mental processes of thinking, understanding and perception or the acquisition of intellectual capabilities for perception of ideas.
Standard Deviation (SD)	The deviation of the anthropometric value for an individual child from the median value of the reference population (NCHS/WHO) divided by the standard deviation of the reference population.
Stunting	The anthropometrics index 'height-for-age' reflecting linear growth achieved pre-and post-nataly, with deficits indicating long term, cumulative effects of inadequacies of nutrition and/or health defined as low ht-for-age (below -2 z-scores) of the median value of the NCHS/WHO International Growth Reference
Underweight	Anthropometric index 'weight-for-age' representing body mass relative to age. A composite of both stunting and wasting or low weight-for-age (below 2 z-scores of the median value of the NCHS/WHO international Growth Reference).
Wasting	The anthropometric index 'weight-for-height' reflects body weight relative to height (below 2 z-scores of the median value of the NCHS/WHO International Growth Reference).
' <i>boda boda</i> '	A term used locally to refer to bicycles
' <i>Githeri</i> '	Traditional Kikuyu staple food consisting of a mixture of maize and beans boiled together.
' <i>Kibarua</i> '	Wage-earning activity
' <i>Mucii-wa-Urata</i> '	C.B.N.P. family life center, initially used as a rehabilitation home for malnourished children.
' <i>Shamba</i> '	Common Kiswahili word referring to a portion of land where farming is practiced

ABSTRACT

In September-October 2002 a descriptive cross-sectional survey aimed at assessing the awareness of psychomotor stimulation practices in 0-36 months old children drawn from households under a Community Based Nutrition Programme/Family Life Training Programme zone was conducted in Mwea division-Kirinyaga District. The principal tool of investigation was a structured questionnaire that was administered to mothers of 0-36 months old children. Methods used for investigation were anthropometric assessment, observation of motor, cognitive and social skills on the study children, observation of maternal activities, timing of childcare activities and focus group discussions. Purposive sampling was done at the programme level and random sampling at the household level giving a sample size of 348 households in which there had to be a child aged between 0-36 months. In any household with more than one child in this age category, simple random sampling was done to avoid bias. Data was collected with the assistance of four field assistants and SPSS computer package was used for data entry and analysis. Nutritional status indices were computed using the Epi- Info programme. Analysis was mainly descriptive with chi-square and correlation tests to assess the level of significance between proportions.

The study established that awareness of psychomotor stimulating activities is lacking in the study community. Observation of maternal activities however showed that there were psychomotor related activities, which the population could not relate to the development of children. For example play to many mothers was there for its own sake but not to exceed a certain age limit. For those who provided playthings (23.1%), this was mainly to distract the attention of the child. Teaching of skills was reported to commence when the child achieved movement and language skills. Skills taught were not cognitive challenging as they involved simple physical activities including speaking (63.0%), singing (22.6%), sweeping (1.6%) carrying dolls (2.5%), walking (10.3%). Of the psychomotor activities observed, holding and carrying child took relatively more time compared with the other psychomotor activities perhaps why gross motor ability ranked higher than either fine motor and cognitive abilities. Low achievement in psychomotor skills by those children who were confined indoors was significant suggesting that lack of experience could be contributing to the poor achievement. Many mothers however pointed out that they were too busy to play with or teach skills to their children.

Very few activities were regarded as childcare activities namely:- food preparation, feeding, bathing, breastfeeding and washing child's clothes. These activities were not significant with maternal characteristics but breastfeeding and feeding were significant with the age of the child.

The study established that Mwea was better off compared to the national figures in the prevalence of malnutrition. The global stunting malnutrition, (28.1%) is lower in comparison to the national figures (33%). Global underweight (18.1%) and global acute malnutrition (6.6%) are lower than national figures (22%) and (6.7%) respectively. This may be a suggestion that the Community Based Nutrition Programme on their fight against malnutrition have had a positive impact on nutritional status of the children. Though the sample size was small to make conclusive decisions, stunted children achieved lowest in psychomotor abilities compared to the underweight or wasted children.

Nutritional status by gender indicated boys to be better off than girls. Observation showed boys being breastfed more than girls and getting relatively larger portions of food. This may suggest the community is still clinging to the age-old beliefs that boys are superior to girls. However, this gender disparity was not significant with psychomotor abilities.

The study established that (96.2%) is socio-economically poor and majority (72.1%) were not aware of time saving methods while the rest (27.9%) could not afford the time/labour saving devices. Of the caregivers identified in the study area, housegirls, though in very few households (1.1%) were found to contribute more positively to the nutritional status and psychomotor development of study children. Apart from the CBNP that offers nutritional approach to eradicating malnutrition and child growth monitoring services, the only other institutions offering pre- and post-natal services for 0-36 months old children are the health institutions in or around the irrigation scheme area. However, services are hampered by the long distances to travel, lack of proper means of transport, cost of services and lack of enough equipment and manpower.

It is therefore recommended that the study community is made aware of childcare practices and their value. Awareness of psycho-stimulating activities and how they contribute to the life-long productivity of the child (economically, culturally and socially) would perhaps change the attitude accorded to the child.

CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND INFORMATION

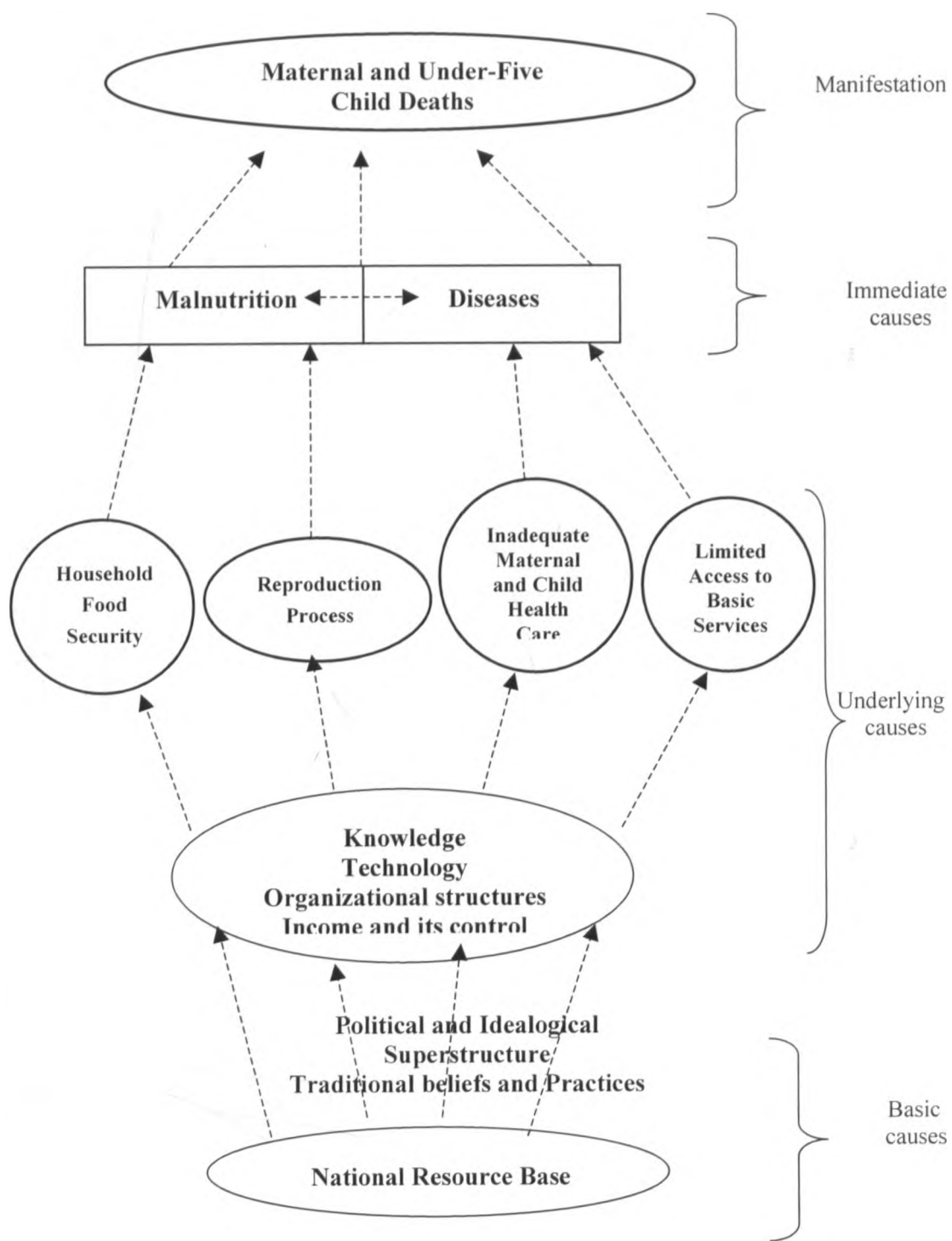
Most developing countries have high percentage of young people. Just under half of the population is less than 15 years of age compared with about one quarter in industrialized countries and some 15-20 percent of the total population is under the age of five years. However, more than 50% of the total deaths occur in children under the age of five, in contrast to a figure of less than 20 percent in developed countries. The infant mortality rate, that is, the number of deaths that take place during the first year of life per 1000 live births varies with factors including the standard of health, supervision, the length of breastfeeding. In developing countries infant mortality usually ranges between 100 or 200 per 1000 which is nearly 10 times higher than in industrialized countries (Cameron and Hofvander, 1983).

In Africa malnutrition continues to kill millions of children, act as a catalyst to various childhood diseases, exacerbate rates of illiteracy and unemployment and impedes overall socio-economic progress. Malnutrition is one of the most important health and welfare problems among infants and young children in Kenya resulting in serious health and economic consequences for both the individual and the nation. Malnutrition results in increased risk of illness and death. In addition, malnutrition can result in lower level of cognitive development, which results in lower educational attainment (Brozek and Schurch, 1984). In adulthood, the accumulated effect of malnutrition can be a reduction in worker productivity and increased absenteeism in the workplace, both of which may reduce individual and national lifetime earning potential (World Bank, 1993). Malnutrition also has inter-generational effect; infants born to women who are themselves malnourished are smaller than those born to better nourished women (Villar and Rivera, 1998). Infants born with low birth weight (defined as less than 2.5 kg) are at greater risk of illness and death compared with normal weight infants (Allen and Gillespie, 2001). Malnutrition is a direct result of both inadequate intake of food and infectious diseases. Inadequate food intake is a consequence of insufficient food at household level and improper feeding practices. Infections particularly diarrhoea, acute respiratory illness, malaria and measles, result from inadequate health care and insufficient water supply and poor environmental sanitation.

Poor sanitation puts infants and young children at risk of increased incidence and duration of illness (Haggerty et al., 1994; Clemens and Stanton, 1987). Diarrhoea disease compromises nutritional status through reduced dietary intake, poor absorption and increased nutrient loss (Brown et al., 1990; Rosenberg et al., 1977; Rahaman and Wahed, 1983). In environments where infectious diseases are common, children typically suffer recurrent infections and are unable to recover fully from each bout of illness. The result is weakened immunity and increased susceptibility to malnutrition. When both malnutrition and infections are present, the result is an interaction that is biologically more detrimental than the combined effect of the two working independently (Scrimshaw et al., 1968).

The conceptual framework given on (Figure 1.1) reflects the relationship among variables and mechanism that lead to child malnutrition. Political, socio-economic, environmental and cultural factors and practices operating at the national and community levels and poverty at the household level ultimately affect the nutritional status of children by determining the availability of educational opportunities, employment, health services and quality of sanitation. Employment, by providing a source of income is an important determinant of household food security. In particular female employment, which offers women opportunity for resource control, has been shown to result in increased food availability, improved childcare practices and nutritional status. Maternal education is a powerful predictor of child nutritional status, and fertility (Moore, 1990). It is frequently associated with the behavioral factors affecting nutritional status such as intra-household food distribution, childcare practices, feeding behaviours and patterns and food handling procedures. In communities that have little access to health care, children are more vulnerable to malnutrition as a consequence of low immunization rates, poor antenatal care and inadequate treatment of common diseases. Poor sanitation also puts children at risk of infection from ingestion of contaminated food and water (Esrey et al., Haggerty et al., 1994).

Figure 1.1: Conceptual Framework for the Causes of Malnutrition and Death



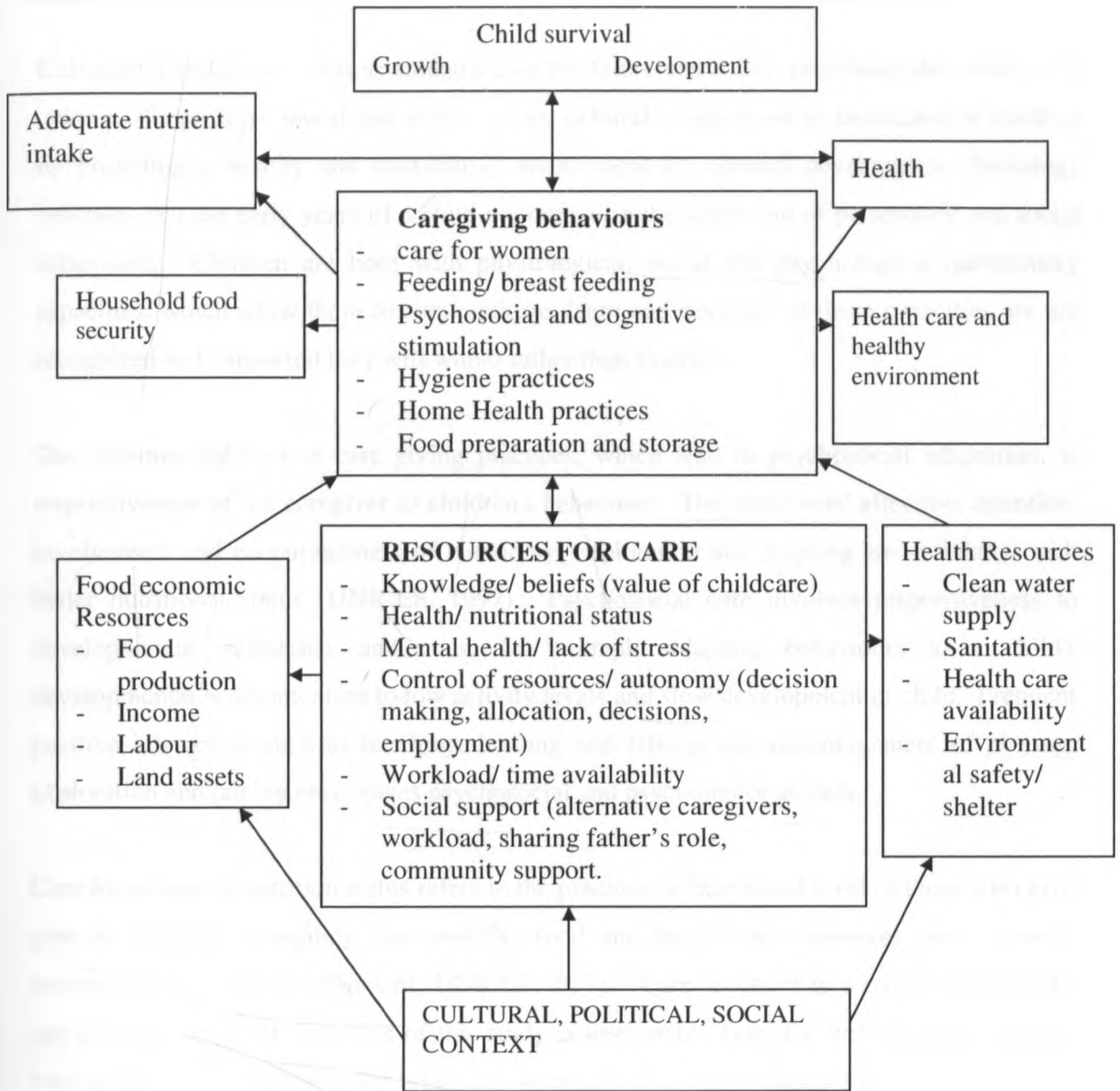
The conceptual framework Figure 1.1, illustrates the major causes of malnutrition and deaths for mothers and under five children in developing countries. Traditional beliefs and practices are going to be of special interest in this discussion. The community and the households could be ignorant or not aware of the best practices, attitudes etc which they could employ to fight the malnutrition. This leads to inadequate maternal and child health care as one of the underlying causes: If at this level no intervention is forthcoming, it results into malnutrition and disease which ultimately manifests itself into maternal and under five deaths.

The need to understand care in the context of this study can be defined as the provision in the household and the community of time, attention and support to meet the physical, mental and social needs of a growing children the synergy of protection and support for their health, nutrition, psycho-social and cognitive aspects of development.

Figure 1.2 on The extended model of care illustrates that the caring capacity is the potential to provide care. If the culture, governance and societal norms would enable the caregiver to acquire the resources for care, this would be an enabling point or facilitation to the care giving behaviours. For example, if the care giver is educated on the value of care giving practices and is given support and autonomy on resource control this would lead to proper feeding habits to the child and family as a whole, hygiene practices, consequently resulting in adequate nutrient intake and health. This manifest into child survival which is the ultimate goal of the model of care.

Inadequate Maternal time due to heavy workload coupled with lack of knowledge and traditional beliefs on gender differences deprives the caregivers of the appropriate care giving behaviours such as psychosocial and cognitive stimulation, proper feeding and health habits. This could lead to malnutrition and diseases which could ultimately result into maternal and under five child deaths. The caregiver time availability and the relative importance with which psychomotor stimulation is regarded will influence level of psycho- stimuli to young children.

Figure 1.2. The Extended model for care



Source: By P. Engle
 P. Menon
 L. Haddad (Care and Nutrition, 1997).

Childcare practices have long-term effects on the child, economically, culturally and socially. Economically, investment in childcare and development has long-term societal

benefits through economic productivity over a person's lifetime. Though this is linked to formal education the process begins well before children enter into primary school.

Culturally children are seen as safeguarding the future since they perpetuate the values of a culture. To preserve moral and social values, cultural values must be inculcated in children by providing a healthy and stimulating environment for optimal development. Sociology indicates that the early years of a child are crucial in the formation of personality and social behaviours. Children are born with physiological, social and psychological rudimentary capacities, which allow them to communicate, learn and develop. If these capacities are not recognized and supported they will wither rather than flourish.

The common element in care giving practices, which lead to psychosocial adaptation, is responsiveness of the caregiver to children's behaviour. The caregivers' affection, attention, involvement and encouragement of autonomy, exploration and learning are correlated with better nutritional status (UNICEF, 1997). Psychosocial care involves responsiveness to developmental milestones and cues, for example adapting behaviours to a child's developmental level, attention to low activity levels and slow development of child. Frequent positive interaction such as touching, holding and talking and encouragement of playing, exploration and talking encourages psychosocial and psychomotor growth.

Care for enhanced nutrition status refers to the practices at household level of those who give care to children, translating the available food and health care resources into a child's survival, growth and development (UNICEF 1997). Care accorded to a child from birth to age of three, which is the focus of this study is inseparable from the well being of women who are the usual care givers for infant and young children (refer Figure 1.2)

Even when poverty causes food insecurity and limited access to healthcare, enhanced care giving can optimize the use of existing resources to promote good health and nutrition in women and children (UNICEF, 1997). Understanding caring practices and resources for care in general should help local people identify the practices and resources, which are important for their cultural and ecological setting.

1.2 STATEMENT OF THE PROBLEM

The formal education system in Kenya takes responsibility on children aged 3 years and above focusing mainly on nursery and primary education. Most of the early child development programmes target children aged between 3-6 years. Consequently, children aged 0-3 years have somehow been neglected and yet this is the period when critical development takes place. So far, care practices addressed and emphasized through the early childhood programmes focus mainly on feeding practices, health and nutritional status of children. Though frequently mentioned, psychomotor development of young children is hardly addressed in programmes. Sociologists and psychologists however underscore the fact that learning and psychomotor development at this age (takes place best through object manipulation, exploration, experimentation and stimulating environment hence trial and error).

Psychomotor stimulating activities have not been addressed to in many of child care studies. Care practices and resource for care tend to be under valued to the extent that they are seen as daily monotonous tasks often performed by women whose roles and status is also undervalued in many societies. Community and government inadequacy in providing support and resources is a major draw back to providing adequate care practices at household level. This study therefore sought to identify the main childcare givers and the activities perceived as child care activities. The activities were observed in the context in which they are performed and time taken to perform each activity noted. This was mainly to establish if some activities were psychomotor stimulating to the child and the perception the caregivers had on such activities.

1.3 JUSTIFICATION

Research has shown that psychomotor stimulation between 0-3 years, improves performance education in the later years of life (Re-Graham McGregor et al., 1991). However many parents are not aware that the children need a variety of new and interesting things to look at, listen to, watch, hold and play with. In the early 1990's, UNICEF began using the term care in relation to nutritional programmes. They found that children who received consistent caring attention were generally better nourished, less prone to sickness and learned better than those who do not receive such care.

Studies that have been done in Kenya on childcare practices include:- Child care practices and Nutritional status of children (0-2 years) in lower Nyakach, Kisumu (Opiyo, 1993) and Child care practices and Nutritional status of children 0-2 years in Makongeni, Thika (Kamau, 1994). Both studies have emphasized more on physical growth (nutritional status), highlighting mainly on the contributory factors and constraints to the growth. The studies did not emphasize on mental or cognitive development of the children. The main justification therefore for undertaking this study is that psychomotor development of infants and young children is a neglected aspect of care which has not been researched on.

1.4 PURPOSE OF THE STUDY

The purpose of this research was to assess the existing knowledge, attitudes and practices in early child development among child caregivers in Mwea Division-Kirinyaga District (rural setting in Kenya). This was to the justification above that psychomotor development is a neglected aspect of care that has not been researched on. It also gives a comparison between urban and rural parents because it is said that urban parents have a greater access to a variety of toys compared with their counterparts in the rural areas. The aim is propose suitable interventions that will improve care practices for rural children.

1.5 OBJECTIVES

1.5.1 Main Objective

To determine time allocation for childcare activities in a rural community and identify care activities associated with psychomotor development in children 0-36 months.

1.5.2 Specific Objectives

- ◆ To identify and describe activities regarded by caregivers as childcare activities and relate them to caregivers characteristics and age of the child.
- ◆ To observe and time those activities describe as childcare as they are performed by any of the caregivers and to relate caregivers characteristics with the time taken to perform childcare activities.

- ◆ To identify any activities regarded as enhancing psychomotor development of infants and young children and to determine the association of psychomotor skills with maternal characteristics and age of the study children.
- ◆ To determine the association of confining children indoors with psychomotor abilities and to relate play materials with the age of the children.
- ◆ To identify the relationship of play and teaching of skills to psychomotor achievements of the study children.
- ◆ To identify the alternative caregivers in the community and their contributions to nutritional status and psychomotor development of the study children.
- ◆ To identify any time saving methods used in performing childcare activities by the caregivers.
- ◆ To assess the nutritional status of the 0-36 months old children and to identify any gender disparities and relate this to psychomotor abilities.

1.6 RESEARCH QUESTIONS

- ◆ Which of the routine activities are perceived as enhancing psychomotor development?
- ◆ What are the factors associated with psychomotor development?
- ◆ Who are the alternative caregivers in the community and what are their contributions to nutritional status and psychomotor development of the study children?
- ◆ What is the nutritional status of children 0-36 months in the study area?

1.7 BENEFITS OF THE STUDY

Findings of this study will be of benefit to:

- Organizations such as NGOs, UNICEF, institutions including CBNP and other agencies who endeavour to improve the nutritional status of children and women and enhancement of social and human capital. Findings may still be used by organizations involved in implementing child survival programs addressing psychomotor development of children.
- Nutrition education- Will help in the development of appropriate educational messages which will benefit mothers and other care givers.
- Information generated could be used by policy makers to broaden the care package for children.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

The order of magnitude of the hazards faced by children in developing countries can be gauged from some relevant global statistics. There are about 500 million children under age 6 years in the developing countries. For many of them the family income is not sufficient to meet their basic nutrient requirements. It is essentially these children who are also the victims of various other forms of deprivation, which place their normal growth and development in multiple jeopardy.

The young child in a poor developing country is subject to multiple hazards. The satisfaction of such basic needs as food and shelter and the availability of such social services as healthcare, water supply, sanitation and education cannot be taken for granted in a developing country. The sequence of circumstances that affect a large proportion of the population rates along the following lines: poverty, malnutrition during pregnancy, communicable diseases, child malnutrition, psychomotor disturbances, retarded physical and mental growth and disabilities, low level of activity, development below potential, low economic productivity in adulthood (UNESCO-UNICEF, Digest 18).

One out of every three children under five in developing countries is malnourished (Smith and Haddad, 2000). In developing countries, infants' mortality usually ranges from 100-200 per 1000, which is nearly 10 times higher than in industrialized countries. The comparison of mortality for the period of one to four years of age is even more unfavorable. It ranges from 30-50 times higher than in Europe and North America (Cameroon and Hofvander, 1983). In the past 10 years the view has been firmly established that the eradication of child malnutrition depends on three factors: household and individual food security, access to health services and a healthy environment, and the adequate provision of behaviours that have the collective label of 'care'. These are behaviours mostly but not exclusively provided by women and are exhibited in many domains including food preparation and food storage, breastfeeding and feeding of very young children, rest and diet for pregnant and lactating mothers, hygiene practices, diagnosis and health-seeking behaviours for young children and the psychosocial stimulation of children (Engle, Menon and Haddad, 1997).

Care is the provision in the household and the community of time, attention and support to meet the physical, mental and social needs of the growing children the synergy of protection and support for their health, nutrition, psychosocial and cognitive aspects of development. Education, knowledge and beliefs represent the capacity of the caregiver to provide appropriate care. The physical and mental health (including self-confidence, lack a stress and depression) of the caregiver represents individual factors that facilitate the translation of capacity behaviours. Finally the autonomy, workload and social support are facilitating conditions on the family and the community. On the other hand a child's environment has a tremendous influence on the way he grows and develops. A child that is brought up in a restrictive environment will be stunted in emotional, physical and intellectual development while one who is brought up in an enabling environment tends to develop his potentialities fully. At the home level, caregiver should ensure children have appropriate shelter, are adequately clothed and that the young ones have enough room and materials for play. The caregiver's affection, attention, involvement and encouragement of autonomy, exploration and learning are correlated with better nutritional status. Psychosocial care involves responsiveness to development of the child. Frequent positive interaction such as touching, holding and talking and encouragement of playing, exploration and talking encourages psychosocial growth and cognitive growth.

Research in the past decades has documented significant association between malnutrition and the cognitive and behavioural development of the children (Allen, 1995; Grantham -Mc Gregor, 1993; Hozoff, 1998; Polite, Germany, Engle, Marturella, Rivera, 1993; Sigman, Neumann, Jansen Buribo, 1989; S.Grantham- McGregor, 1990; Wachs, 1995). These studies found out that school aged children who suffer from severe malnutrition exhibit significantly compromised reasoning and perceptual-spatial functioning, poorer school grades, reduced attentiveness and unresponsive play behaviour, as compared to their adequately nourished peers. In addition, children suffering from mild to moderate nutrition, a condition that affects over 30 percent of the world children, and occurring in both developed and developing countries, shows significant deficit in intellectual and behavioural functioning. Deficits include compromised development in multiple domains, including verbal and spatial reasoning (Sigman et al 1989b; Wachs, Bishry, Moussa and Yunis, 1995),.. activity and leadership behaviour and ability to concentrate in the classroom (Popkin and Lim – Ybanez,

1982). The long term cost can be measured in terms of school dropouts, unemployment, delinquency and inter- generational perpetration of poverty and failure (Grant, 1985).

In the Kenya situation some of the studies done (Opiyo,1993 and Kamau, 1994), concentrated more on constraints and contributory factors to the physical growth of the children. The former study dealt more on knowledge of important care giving behaviours, value of children in the society, maternal/care giver work load and health, time saving methods and alternative care givers. The latter study dealt on the maternal activities and time spent on the perceived child care activities, maternal level of education and occupation, substitute care givers and under five children in the household. Both studies based their research on how the named factors affected the nutritional status of the children. In their conclusion, time factor and value of child care activities were great hindrances to child care. It was notable that none of the studies dealt with psychomotor aspect of development. This study therefore emphasizes more on motor and cognitive aspect of development.

2.2 The Need for Adequate Care in Babyhood

Child development is a process of change in which the child learns to handle even more complex level of moving, thinking, feeling and relating to others (Myers, 1992). Myers elaborates further that child development is determined by continuous interactions between biological predisposition, hereditary factors and environmental experiences. One way in, which it can be inadequate, is lack of provision of adequate care to the child by the mother or mother substitute. The critical environmental factors are the burden of repeated infections and the low food intake, which could be attributed to poor childcare and environmental sanitation (UNICEF, 1989). Care practices and resources for care may not receive much attention by those concerned with nutrition; they may be included in nutrition assessment or plans only superficially. These practices and resources tend to be undervalued or undercounted, perhaps because they are daily time consuming and repetitive activities principally performed by women. Yet practices can determine the cause a child's life (Care initiative 1997). UNICEF 1997, UNICEF 1998 also reaffirmed this by indicating that child care has received little emphasis perhaps due to the fact that it has rarely been reported as one of the immediate underlining cause of malnutrition. Among the range of caring behaviours that affect child nutrition and health, the following are the most critical: feeding, psychological support, care

and support for mothers, hygiene practices and health seeking behaviours (UNICEF 1997, UNICEF 1998, Lamountague *et al.*, 1998, Abel, 1998).

2.3 Knowledge of important care giving behaviours

Care giving behaviour may be categorized as:- 'enhancement' care that enables the child to attain more growth/development physically and psychologically. These skills include, teaching a skill to a child such as walking, playing or talking with the child. The other type is 'compensatory' care that enables the child to return to a previous state of health and development including feeding practices, seeking medical care in times of illness (Kamau 1994). If parents do not value enhancement child care, extra time may be spent on other activities deemed to have a higher value such as income generating activities rather than care (UNICEF 1992). Demand for care or the perception of the importance of early and intense investment in the child varies from culture to culture and between individuals. Positive regard of child care in the society could translate in to positive regard of child care activity by the mother or the care giver (UNICEF 1992).

2.4 Care giver time availability and allocation for child care

The multiple roles of women in poor households as mothers, home managers, producers and commonly as organizers, frequently set two of their primary resources, namely, income and time in conflict (ACC/SCN, 1990's). Analysis of study done by Leslie, 1987 in the development countries revealed less time allocated for child care compared to other maternal activities. The value of investing time in child care and stimulation of child development is not always obvious to parents. Unless parents perceive that additional time with the children will have benefits to themselves or their children, strategies to increase their available time will only have minimal effects on time devoted to child care (Engle and Ricciuti, 1995). Time allocation for child care may be influenced by factors such as mothers occupation, age of the mother, work load, value of child in the society, knowledge of important care giving behaviours etc. Occupation of the mother especially income earning may have major implications for the care of the child. On the other hand, evidence, however suggest that alternative care by adults does not have negative effects on the child growth and development (Engle, 1991).

At some point during the reproductive age, women may be faced with crisis of combining economic productive work with nurturing children. This burden, however inevitably falls heavily on low income women in the developing countries (Leslie and Paulisso, 1989). A significant portion of women's high work load relates to the low or unpaid household production... "constantly competing demands on women's time and an unyielding round of dreary and under enumerative (not counted) tasks" (Carr and Sadhu, 1987).

The value accorded to a child may also who determine the amount and quality of care the child receives. UNICEF, (1992) reports that Ravindran, (1986), found son preference in many parts of the world, particularly in the middle East and South East Asia where child care for girls was not as good as for boys. The girls therefore have a higher rate of morbidity, mortality and less food allocation. They are also less likely to be provided with medical care and receive less schooling. Among Luo community in Western Kenya and indeed many African communities "a male child is looked upon as a dynamic element in the lineal structure. On the other hand, a female child though a potential source of wealth is regarded as exporter of fertility from her parent lineage to the lineage of her husband" (Ominde 1987). The cultural preferences of certain child characteristic may therefore influence the caring behaviour the child receives.

2.5 Effect of knowledge, beliefs, attitude and education level on caregiving

Education for caregivers is one of the most important investments that can be made in children's growth and development. It has generally been recognized that mothers with more education have better nourished children. More educated mothers may be more assertive and make better use of health services, provide better child care such as feeding, have better hygiene household practices and personal habits, have an increased knowledge of appropriate child rearing or have high status in the family and thus more control of family resources (UNICEF, 1997). Levin, (1981) found that Mexican mothers with more education interacted verbally with their children more often than those with less education. According to Levin, the educated mothers take a more active role in the education and stimulation of their children than less educated mothers (Kamau, 1994).

Beliefs, attitude and knowledge about childcare practices can have significant impact on child development. For example, in a number of developing societies breast-feeding is a universal practice which is initiated soon after birth (Harrison *et al*, 1993; Cosmic, Mhlogi and Bank, 1993). In other cultures, particularly in the Indian sub continent and other parts of South East Asia, there is a strong believe that colostrum is highly undesirable and prelacteal feeds of sweetened water, goat's milk or diluted cow's milk, are commonly given in the first two to three days postpartum (Keissland and Burghart, 1988; Blanchet, 1984; McDonald, 1987; McGilvery, 1982). Food taboos for young children may limit the types of foods that can be offered (Ver Estreik 1989). In Iran, the introduction of a variety of foods is often delayed, based on the perception that young children cannot digest the foods that are available for the children (for example beans) or that some food cause stammering and delayed speech (eggs) and impair the intellect if introduced before 18 months of age (cheese) (Rabiee and Geissler 1992). Such attitudes obviously will tend to perpetrate malnutrition of young children.

2.6 Caregivers health

A caregiver's good health improves care for children. Therefore the capacity to provide care at household level largely depends on the health of the mother (FAO/WHO 1992). Physical health includes nutrition, medical care services, pre-natal care and care for the girl child. Mental health needs include self confidence absence of depression and reasonable levels of stress. Stress is often caused by difficult circumstances such as lack of support and lack of control over resources. A caregiver who is experiencing depression or anxiety, or who is living under a lot of stress, will find it difficult to provide patient loving care. Self confidence and self esteem are often related to status within the family and the status of women within the society. Self confidence has been linked with improved care giving behaviours and confident care givers are more active feeders when children refuse food.

Physical health of the caregiver enhances caring ability. When the caregivers are ill they are less able to give appropriate care to infants and young children (Winkvist, 1995). Winkvist also noted that anaemia reduces work output and causes fatigue, apathy and loss of mental concentration, all of which can undermine care givers ability to take care of children. Egyptian mothers with anaemia were found to interact less often with their infants, to talk to them less and hold them less than mothers without anaemia (Rahmanifer *et al*; 1992).

2.7 Dietary care during illness

Parental food withholding coupled with refusal to eat and lack of appetite by the child during illness contribute to the reduced food intake of children during illness. Martinez and Tomkins (1995) noted that for centuries, the dietary advice of health providers for treating diarrhoea consisted of food reduction or fasting, and then reintroduction of foods during the recovery period. Promotion of this practice was meant as a strategy to avoid the problem of malabsorption, reduce stools volume and duration of diarrhea. Currently, however it is recommended that breastfeeding and/or feeding other foods during episodes of diarrhoea or any illness should be encouraged (Martnez and Tomkins, 1995; Neda *et al.*, 1988). The extra fluids given to the child help replace the liquid being lost and the foods help him sustain some energy.

2.8 Hygiene practices and sanitary conditions

Hygiene practices directly affect the cleanliness of the environment and the number of infection agents children ingest either through contaminated food or water or by placing contaminated objects in their mouth. The caregiver's behaviour plays a major role in controlling the child's hygienic practices. Hygiene practices are divided into personal and household hygiene. The personal hygiene includes hand washing before handling the cooked foods and feeding children after defaecation and after handling children's wastes, bathing and cleaning the child. Household hygiene practices include cleaning of the house and play area, adequate waste disposal, use of sanitary facilities and use of safe water (UNICEF, 1997). Unhygienic feeding techniques can affect the nutritional status of a child. The use of the cup or the spoon is recommended unlike the bottle which poses a higher risk of contamination. (Mitzener *et al.*, 1984).

2.9 Importance of breastfeeding and complementary feeding

Breastfeeding practices and introduction of supplemental foods are important determinants of the nutritional status of children, particularly those under the age of two years. With improved nutritional status, the risk of mortality among children under five years can be reduced and their psychomotor development enhanced (KDHS, 2003). Breast milk is

uncontaminated and contains all the nutrients needed by children in the first four to six months of life; supplementing breast milk before four months is unnecessary and is discouraged since the likelihood of contamination and resulting risk of diarrhoeal disease are high. Providing foods or liquids in addition to breast milk during the first six months of life has been shown to have no benefit on growth (Cohen et al., 1994; Martinez et al., 1994). Early supplementation also reduces breast milk output since the production and release of milk are modulated by the frequency and intensity of suckling (KDHS, 2003). A study in Sri-Lanka showed that 25% of the mothers in urban areas begin giving semi solid foods after the fourth month and 80-100% of the mothers introduce solid foods by the age of 12 months (Juntirin and Visuit, 1995). KDHS, (1998) had also found out that supplementation of breast milk starts too early in Kenya. Exclusive breastfeeding is not common; only 28% of children under two months, and 17% of children under four months of age are fed only breast milk. Most children are given just plain water (18%) or other foods and liquids (53%) in addition to breast milk in the first two months (KDHS, 2003). By age 2-3 months, most of the children will have received a form of supplementary food in addition to breast milk.

At the age of six months infants need safe and adequate amount of complementary foods in addition to breast milk in order to meet the nutrient requirements for optimal development (WHO,1994; UNICEF 1997). The complementary foods given include formula milk, cow's milk or any other type of milk, starchy tubers. Other liquids include plain water, juice, sugar water and porridge. The proportion of children fed on protein food such as meat, poultry, fish and eggs which are important foods for growth, recovery from illness and mental development is quite small and provision increases with age (KDHS, 2003).

The duration and frequency of breastfeeding vary across background characteristics of the mother. KDHS, (2003) also found out that rural mothers breastfed for longer durations than their urban counterparts. Uneducated women were also found to breastfeed longer than educated ones with daily frequency of breastfeeding being quite high. The ways in which care givers facilitate and encourage eating by the young children can play a large role in children's nutrient intake. Active complementary feeding practices can have behavioural influence such as adapting the feeding method to the child's psychomotor abilities for example spoon feeding.

2.10 Psychomotor development

2.10.1 Motor Development

Motor refers to motion, and motor development is the infants growing ability to use his or her body for purposeful, voluntary motion (Steinberg and Belsky, 1991). To illustrate that environmental influence affect motor development a study was conducted on Iranian orphans raised in three different institutions. In two of these, the babies were simply lying on their cribs with feeding administered via a bottle propped against pillows. Sheets covered the sides of their cribs, restricting their views. Except when they were picked up to be bathed, they could neither touch nor see other people. In the third orphanage, infants were encouraged to sit up, to play and to interact with others. It was found out that in the two first orphanages, the major milestone of motor achievement was markedly delayed. Most of the children were not sitting up by the age of one year, and many were still not sitting by 21 months. Even by the age of 3 years, the majority of the children from these two institutions were still not walking. This study illustrated that genes alone do not direct motor development. The development of movement or motor skills goes hand in hand with the development of perceptive, cognitive and social skills.

Schiamberg, (1991) expresses that between birth and three years of age, infant motor development moves from very general reflexes to differentiated (and relatively skillful), movements. The gross (large) motor systems regulates movement of head, body, arms and legs. The fine (small) motor system governs the movement of hands, fingers, feet, toes, eyes and lips. Both gross and fine motor skills become more precisely regulated and controlled by the infant as it grows. Normal growth requires both physical and social stimulation. It is questionable if some child rearing practices could speed up or enhance motor development.

In an experiment done in the U.S.A, walking was advanced by several months when parents stimulated the stepping reflex in infants during the first two months of life (Zelazo, Zelazo and Kolb, 1972). Along the Kipsigis tribe of Kenya, whose infants spend more than 60% of their waking time sitting in someone's lap, infants are able to sit alone earlier than would be expected (Kilbride,1977; Super 1981). In many African tribes, babies are traditionally carried on someone's back; such infants do seem to develop stronger trunk, buttock and thigh muscles. On the other hand, crawling and creeping rarely appear precociously among African infants, possibly because babies in Africa are rarely placed on the ground on their stomachs

(Kilbride, 1977; Super, 1981). There is also evidence that early experience of self produced locomotion like crawling or using an infant walker, may speed up development of certain emotional and cognitive abilities by about a month or so. Steinberg, (1991) asserts that motor skills develop in the same sequence and at roughly the same age irrespective of the different backgrounds. He attributed this to genetic factors but to demonstrate that environmental influences affect the motor skills, the study on Iranian infants explained above resulted in marked delays in milestone achievements in those who were denied some physical stimulation.

Heredity sets the sequence of motor development, but its expression in each infant is influenced by experience. The culture infants live in, their families and others in their lives will affect the outcome of every baby's genetic plan to growth and development. Psychomotor development can be delayed by emotional and sensory deprivation or it can be speeded up within limits by extra physical stimulation. The psychomotor research in the current study revolved around the behavioural tendencies expressed by the children in various aspects of observation.

2.10.2 cognitive development

This is acquisition of intellectual capabilities by which knowledge is gained about perception of ideas. Piaget, (1968) documented of gradual emergence of the basic elements of intelligence during the first two years of life (Appendix 5). Because it is based on the senses and on motor action, Piaget used the sensorimotor to describe this first period of cognitive development. A baby begins to understand an object by tasting, touching, seeing, hearing and smelling it, by bumping into it, grasping it, lifting it and dropping it. Piaget's work as expressed by Steinberg, (1991), underscored the fact that behaviour is largely reflex in the first month of life but between 1-4 months, the infant is able to coordinate eyes and ears, that is, the eyes can follow the movement of an object and the child can also turn the head to the direction of sound (sensorimotor intelligence). According to Piaget, playing is learning. If a four - month old infant is given any toy, most likely: - puts it in her mouth, shakes it, turns it over, bangs it, drops it or simply looks at it. This is "in differentiated Exploration" (McCall, Eichorn and Hogarry, 1977). At around 8 months transition, an important change occurs- if for example you give her a ball, she discovers that it rolls, and she will repeatedly make it do

that. If you give her a toy telephone, she examine it and when she finds the dial, she will spin it over and over again. This is called functional activity and by age of 12 months, she can relate items, e.g., receiver on the phone . This is "functional - relational" level of play, i.e., can now figure out the obvious way in which two things relate to each other. By their first birthday, most infants begin to show live "pretense play", e.g., a baby will "drink" from an empty cup and talk into a toy telephone, and soon will get others into his game. Sometimes around the 18th month toddlers begin to substitute some objects for others, putting a doll to bed and covering it with a paper. Symbolic thinking opens up a whole new world of play and is so doing, affects the way in which the child learns about the world. Whereas the 7 - month old discovers how to see his arm, the 8 month old discovers what the arm can do, e.g., shake a rattle, it makes a noise, bat a mobile, it moves.

Infants learning that their own action can cause separate results is the hallmark of this phase and signals the start of the *Intentional Behaviuor*. Simply stated, babies who receive a lot of attention from their parents function better intellectually as children than those who receive less parental attention. Parental attention includes many kinds of behaviours; even just looking at an infant can make a difference. Physical contact between parents and child is also related to intellectual competence in infancy and beyond (Lewis and Goldberg, 1969; Tulkin and Govitz, 1975; Yallow, 1961). Actually it may not be the parent's attentiveness in itself that is the key factor. Parents who talk to their babies for example engage the infants' attention and encourage a response such as a smile or vocalization. Over time infants who have gotten a lot of verbal stimulation become more skilled at using language themselves and show higher levels of general cognitive functioning (Beckwith 1977; Clarke -Stewart, 1973; Engel and Keane, 1975; Nebon, 1973).

Parents also influence cognitive development by giving their infant's toys and other objects to look at, touch and manipulate (Bell, 1971; Bradley and Caldwell, 1976,1984; Clarke - Stewart, 1973; Engel and Keane, 1975). Such material stimulation is best when it is geared to the child's level of development and interest. Therefore play things need not be elaborate, often the best 'toys' are ordinary household items such as pots and pans, wooden spoons and plastic cups which toddlers love to "cook" beside their parents.

Another dimension of cognitive stimulation is the parent's responsiveness. Watch a sensitive mother interacting with her 4 - month old baby, she talks, he bubbles back, she laughs and

coos, so does he. He drops a toy and fusses, she picks it up. Children whose parents respond to them in these ways are more competent intellectually both in infancy and later on than children the same age with less responsive parents (Cavem, 1980; Clarke - Stewart, 1973; Hardy - Brown *et al*, 1981; Martin, 1981; Yallow *et al.*, 1973).

2.11 Attributes of Psychomotor Development

Attributes of psychomotor development as pointed out by Steinberg, (1991) include nutrition, central nervous system, genes or heredity material and environmental influences. Without adequate and right diet all manner of development will be compromised. The central nervous system controls all the activities/functions in the body. It has been documented that the last part of the brain to develop and the least mature at birth is the outer layer (cerebral cortex) which is responsible for motor, sensory and higher order cognitive skills. As the brain matures, the child progressively gains control on motor, sensory, thinking and reasoning level. This maturation goes on until adolescence reason why this young adult is still referred to as a child at age 18 years. Genes or hereditary factors set the sequence of motor development, meaning they determine the timing of changes within the brain. Genes have programmed sequence of changes that occur in child development. If nutrition is inadequate for a prolonged period of time a gene may fail to express a developmental trait for example the full height potential of a child may fail to be expressed leading to a stunted child.

Environmental influence which is the core of this study, includes sensory and emotional stimulation. It is an important psychomotor attribute without which one may end up with a child with a “full stomach and an empty brain”. Iranian orphans who were restricted indoors (section 2.9.1) had their motor, cognitive and social skills development delayed drastically.

Infants learn through the senses. Objects around the child are important sources for gathering information from either by discovering, exploring and learning. As the brain matures thinking and reasoning improve thereby allowing the child to interact with even more complex object.

The way a caregiver avails themselves to attend, support or care for the child contributes a great deal in the sensory and emotional development of the child. Interaction, responsiveness, involvement or participating in children activities influences this formative stage in child's development. The child gains more confidence resulting into an assertive and autonomous child. Emotional and sensory stimulation influences personality, character and social behaviour of a growing child. It is therefore important that the caregivers spare time to care for the child and also provide play materials to the growing child.

2.12 Indicators of psychomotor development

Gesell Developmental schedules form the foundation upon which many psychomotor tests are based today (Steinberg, 1991). Gesell included four main areas of psychomotor testing:-

Motor : balance, sitting, locomotion

Adaptation (cognitive): alertness, intelligence, exploration

Language: vocalization, gestures, facial expressions

Personal/social behaviour: feeding, dressing, toilet training.

These give primary indicators of psychomotor development which include motor, cognitive, language and social skills at a specified age.

For the current study, the researcher considered one aspect or two in every category. For example, in motor category considered locomotion caused by the handling of toys and the ability to jump. In adaptation or cognitive category considered the exploration of toys, alertness or memory in remembering naming of the parts of the body. Language was observed while handling of toys and by looking at the facial expressions or vocalization. In the personal/social behaviours considered the unbuttoning of front shirt/buttons. However, behaviour does not occur in isolation but involves all the elements of psychomotor development (motor, cognitive, language and personal/social skills).

2.13 The alternative caregivers

Mothers are usually the primary caregivers but women generally have the principal responsibility for caring for infants and young children as mothers, grandmothers, daughters, aunts or child caregivers (Engle, 1992). Several studies have shown care giving by preteens and young children has been associated with reduced food intake and poorer nutritional status in the care of children. Other non -family caregivers such as house girls (maids), neighbours

or friends also contribute to the care in the community. House girls are often pre-teen girls with little experience and low status within the household. More often than not, maids are subjected to poor care giving, overwork or even abused by their employers. The girl child has the misfortune of becoming a caregiver from as early as four years instead of receiving care herself. When the need for the alternate caregiver is great and no other solution is present, older children are kept out of school to help at home while mothers work (Myers, 1992). Shar *et al.*, (1979), reported that the age of the caregiver was associated with the nutrition status of the children. Child may not be able to nurture a child but only adds to the multiplicity of children problems.

The contribution of the father is often overlooked and can be an important human resource to children. In Brazil, it was reported that children who lived with their fathers and were under four years of age were less likely to fail in school than children whose fathers were absent (Richardson, 1995). But in almost one third of households in developing countries fathers do not reside with their children. Some studies however have shown that children with non-resident fathers appear well nourished than those with fathers present particularly in Sub-Saharan Africa. It is therefore critical for the caregivers to have knowledge, time commitment, have proper health in order to accord appropriate care to their children.

2.14 Time-Saving Methods in Childcare

Many activities compete for mother's time and energy, hence many tasks cannot be well covered and shortcuts are taken. A common timesaving practice is reduced frequency of cooking meals, which in turn reduces time for collecting firewood and fetching water. Other methods are use of unboiled water for drinking and use easy to cook foods (Basse,1994). Most of these shortcuts that women use to save time and energy are detrimental to child's health and nutritional status. Reduction in frequency of cooking means foods will in most cases be eaten cold hence increased chances of food borne infections. Quick to make foods may mean reduction or less consumption of protein energy rich foods. But some technological innovations that have been introduced to reduce the time taken in household food processing may not have been accessible to all women including closer water supply, improved stoves, grinding or processing techniques. However it must be noted that these measures do not always save time. For example, Leslie, (1988), reports that Whiting and Krystall study in Kenya revealed that women's workload were not reduced by making water available closer to home but rather this increased the number of trips to the water source.

Thus it is not clear whether reducing the women's workload would translate into more time on child care (UNICEF,1992) unless they prioritized it as an important 'activity' compared to other competing demands such as income generation, food preparation, cleaning or rest (FAO/WHO,1992). But nevertheless, the knowledge and use of work simplification technique method is necessary for the mothers of children under three years so that they may have more free time and energy for childcare activities that enhance growth, development and survival children.

2.15 Gaps in knowledge

Although several studies have been done on childcare in Kenya, they have based their research mainly on the physical growth of the child (nutritional status). The main justification of this study therefore is that motor and cognitive aspect of development is a neglected aspect of care. Many studies on child care have identified the mother as the primary caregiver but they have not fully outlined the contributions the 'other' caregiver has on psychomotor development of the child. Though the constraints that surround time allocation for child care have been studied, most of them have not been linked directly to maternal or caregivers allocation for child care activities.

CHAPTER THREE.

3.0 STUDY SITE

3.1 Location and Population

This study was carried out in Tebere and Nyangati locations of Mwea division in Kirinyaga district (appendix 9). The district has four divisions namely:- Ndia, Gichugu, Kerugoya/Kutus Municipality and Mwea. Mwea is the largest division covering an area of 512.8 sq km and has a population of 125, 912 males and 62, 036 females. The division borders Machakos and Embu to the south with Embu extending to its eastern side. To the West is Murang'a district with Ndia and Gichugu divisions to the north. Mwea is more disadvantaged than the other three divisions in that there is poor food production as the division lies in the arid and semi-arid region characterized by a high rate of evapo-transpiration.

3.2 Mwea Division

Mwea has two distinct regions:- The Mwea Irrigation Scheme and non-irrigation area. This study is based on the Mwea Irrigation Scheme area which is a rice irrigation zone. The area has five sections:- Tebere, Thiba, Mwea, Wamumu, and Karaba. The study was conducted in two locations, Tebere and Nyangati which are in Tebere section. Tebere section was purposively chosen for this study since it is the largest, oldest and has the highest number of villages compared with the other sections.

3.3 Mwea Irrigation Settlement Scheme

The Mwea Irrigation Scheme is located on the plains of mount Kenya in Kirinyaga District of central province. It is about 120km North East of Nairobi and 1160 metres above sea level. The area is semi-arid with a climate that is relatively dry and hot most of the year. The annual rainfall varies from 720mm to 1130mm (average of 950mm/year). The rainfall is bimodal with a maximum precipitation in April and May (long rains) and October and November (short rains). Average temperatures are in the range of 16 - 27°C. The soil consists of;

- (a) Well drained reddish brown lateric clay loam (red soils) which is suitable for variety of crops like maize, pulses, groundnuts and fruits and,
- (b) Impermeable montmorillonitic clays with 80% clay (Black cotton soils), suitable for rice irrigation

The irrigation water is tapped from the Nyamindi and Thiba rivers and fed to the scheme by gravity. This makes water distribution cheap.

The irrigation scheme was started in 1954 by the colonial government who utilized free detainee labour to dig irrigation canals and work in the rice fields. The first settlement on 400 hectares of land in the scheme, was given to landless former political detainees or workers of the colonial settlers. They were not necessarily from the vicinity, however the then policy was to absorb community members from the neighbourhood who qualified irrespective of their capability in irrigation farming. Initially the scheme was directly managed by the Ministry of Agriculture through provincial agricultural boards using appointed civil servants. In 1996, an act of parliament governing irrigation (irrigation act, 1981) was enacted. This created the National Irrigation Board (N.I.B), which managed the scheme until 1998. Two main objectives of the scheme were, (i) to produce rice for domestic consumption, thus reducing reliance on imports and, (ii) to provide employment and income for historically landless and jobless families.

By 1982, the total scheme land had expanded to 31, 000 acres, 14, 400 acres were under paddy cultivation while the rest (15,600), excluding swamps and red soil patches, were utilized for the settlers villages and schools. Rice production provided livelihood in whole or part for 40, 000-settling families. The houses were constructed and rented to them by the N.I.B, but often farmers were given loans and a plot of 60 x 90ft on which to build their houses. In the course of time, these compounds have become congested making the villages very crowded. Homesteads with animals are extremely unhygienic during rains when some villages get flooded.

A short ethnographic survey revealed that some people to this day have not had toilets and share with neighbours. The deplorable conditions of these latrines partly have been responsible for outbreaks of cholera in 1984 and meningitis in 1988/89 within some of the villages.

Each settler was leased a four acre holding for a year and renewable subject to satisfactory performance. The farmers therefore, did not have permanent ownership (Title deeds) of the land. This means they could not sell or subdivide the holdings among their children. This way settlers had to adhere to strict management regulations or have their licence terminated if they did not live - up to the management's expectations. Apart from maintaining the minor canals, transplanting of seedlings, weeding, harvesting, threshing and packing the paddy, the farmer had little part in planning activities. N.I.B provided the irrigation water, maintained the roads and canals, supplied water to the homesteads via canals, decided the rice variety to be grown and which 'plot units' to do so. They also planned the collection, storage and marketing of the paddy. The schedule for all these activities was done by the management including deciding the costs of services to deduct from farmers. Though many farmers would have preferred more involvement in planning most scheme activities, they were more on the receiving end (Ireni, 1986).

Besides the four acres, some tenants are allocated varying sizes of land in the red soil patches within the scheme. Though they are not meant to be irrigated, in recent years farmers have been using level water to irrigate them through gravity or water pumps. Initially, these plots were planted with maize, beans, vegetables, sweet potatoes and fruits. These foodstuffs were for home consumption and could be sold only if they harvested more than their storing capacity. Tomatoes and French beans have been replacing the subsistence crops in the red soil plots. This is because there is a market for them and prices remain reasonably high throughout the year. Family members are able to get more than Kshs. 100 per week either through their own production or through casual work in other vegetable fields. The supply of cash, even though in small amount, is spread through the year unlike income from rice, which comes in lump sum. This money is usually used in purchasing food in the homes. Many young men and women have left school to enter into this venture. The new enterprise is, however time consuming and women who are part of this undertaking are left with little time to care about their children. Though one is not supposed to keep livestock within the scheme (Republic of Kenya, 1983), cowsheds are scattered in the villages. The animals are grazed in the rice fields after harvest but they are normally grazed in the red soil patches within the scheme. These animals provide milk and draught power at cheap prices to the villagers.

Services provided by the scheme include (a) improved water sources (b) Schistomiasis control campaign and (c) provision of antimalarials to children below five years which is no

longer the case to date. Communication and other services are poorly developed, for example; no village has electricity or a sewage system. Majority of the households in the scheme use either river or canal water for domestic use. This water passes through fields, treated with chemicals and fertilizers and highly unsuitable for consumption.

3.4 Infrastructure

3.4.1 Health Facilities

Mwea is served by eight dispensaries and three health centers most of which are situated in the borderline to the non-scheme area. Apart from offering medical treatment, the Mwea Mission Hospital is offering maternal child health services. The hospital is however considered expensive by the Mwea population who prefer to use the lesser equipped health centers like Kimbimbi Hospital. Majority of the mothers however confine at home with assistance from TBA's, citing the distance of the health centers to be too far from the villages and lack of proper means of transport.

Community Based Nutrition Programme working in conjunction with Family Life Training Programme addresses on issues pertaining to child growth and development. Besides nutritional awareness approach to eradicating malnutrition at the community/household level, the Programme offers growth monitoring services for children aged below 5 years. The FLTC at Mwea also does referrals to Kerugoya District Hospital for the seriously malnourished or sick. The only disadvantage is that the center is not sufficient to serve the extensive irrigation scheme region and many mothers do not make use of its services effectively.

3.4.2. Education Facilities

In 1995 Kirinyaga District had a total of 225 primary schools. Compared to the other divisions in the district Mwea has the least number of primary schools, least teachers and least pupil enrolment .

3.4.3 Communication Network

The Mwea irrigation scheme area is well served by road network. However, during the rainy seasons, earth roads become impassable by *boda bodas* which are the transport means in the area. The area has adequate telecommunication network coverage. There is an airstrip in

Mwea, which is usually used by small planes to spray birds that destroy rice. But to date the spraying has ceased since the N.I.B quit the scheme.

3.4.4 Water Facilities

Mwea Division has adequate surface water resources. Five major rivers flow from the highlands and Mwea has been found to have underground water potential. Although Kirinyaga district has adequate water supply, coffee factories and Sagana Tannery in the north discharge their effluent into the rivers contaminating water at the lower parts of the district. Mwea division, which is at the extreme south, is more affected by this water pollution in addition to pollution through fertilizers and chemicals.

3.4.5 Energy Supply

Electricity is supplied to all divisional centers. Most of the public institutions are also supplied with electricity. But most of the trading centers in the interior of Mwea do not have electricity.

CHAPTER FOUR

4.0 RESEARCH METHODOLOGY

4.1 Study Design

This was a cross-sectional study with a descriptive component undertaken in Mwea division, Kirinyaga District, Kenya. The survey was conducted in September and October 2002. A total of 348 children between 0-36 months comprised the study population. A structured questionnaire was used to collect information on demography, housing and sanitation, health care practices, maternal and childcare activities, alternative caregivers, psychomotor development and time saving methods. The questionnaire was administered to mothers with children aged 0-36 months. Household observations were conducted on a sub-sample of 40 mothers and their 0-36 months old children. Childcare activities performed were timed in order to ascertain time allocation on various activities. Information collected from the questionnaire and the results on the timing activities were verified by conducting focus group discussions on a sub-sample of 36 households with mothers of 0-36 months old children.

4.2 Preparation for the Study

Before conducting this study, a research permit (appendix 10) was sought from the Ministry of Education. The confirmation to carry out the research was communicated to the Kirinyaga District Social Development Officer and thereafter the purpose of the study was communicated to the Tebere administrative officials. After this, the principal investigator briefed the community leaders about the purpose for the study. Through the community leaders the objective of the study was transmitted throughout the households in the villages.

4.3 Training of Research Assistants and Pretesting

Enumerators were recruited from the Mwea Irrigation Scheme area. The candidates chosen had completed high school and had a good command of the local language. Training was given for three days at the CBNP's family life center which is on the northern outskirts of Wang'uru town. The training involved how to administer the questionnaire and its translation to the local language, how to approach the target respondent and how to take the anthropometric measurements correctly. The enumerators were also trained on how to conduct focus group discussions and how to carry out observation sessions.

4.3.1 Pretesting

Pre-testing of the study tools was carried out in Githogondo village which was not part of the targeted population but is in the scheme area. Twenty households with children aged 0-36 months were sampled for piloting. Each enumerator administered the questionnaire in four households. Observation sessions were conducted for two days per enumerator and a focus group discussion comprising of 12 respondents and the research team was conducted once.

The result was discussed with the supervisors and some minor changes on the questionnaire and focus group discussion guideline were made.

4.4 Study Population

The study population consisted of children aged 0-36 months and their mothers where households are under the CBNP and FLTP project areas in Tebere and Nyangati locations in Tebere Section of Mwea Irrigation Scheme area.

4.5 Sampling Frame

It consisted of households in the study area with children aged 0-36 months with their mothers/caregivers as the respondents. From the list of households developed by registering all the households with children 0-36 months in the two locations, 348 households were randomly selected for the study.

4.6 Sample Size Determination

Since the prevalence of malnutrition in the under 3 years old children in the division is not known, the extent of the problem in the area was estimated to be 27.5% which is the prevalence rate of malnutrition under 5 years old in Central Province (GOK/UNICEF, 1992). Since the study children (< 3 years) was less than 10,000 (1390), the statistical formula below for descriptive studies was used (Fisher et al., 1991).

$$n = \frac{Z^2 pq}{d^2}$$

Where n= The desired sample size

Z = Standard normal deviate, set at 1.96 which corresponds to

95% confidence
p= The given prevalence rate of malnutrition = 27.5%

q= 1-p estimate of non-malnourished children in this study
q= 1- 0.275 = 0.725.

d= degree of accuracy desired set at 5% (0.05)

$$\begin{aligned} \text{Hence } n &= Z^2 pq/d^2 \\ &= \frac{1.96^2 (0.275 * .725)}{0.05^2} \\ &= \frac{3.8416 * .1994}{0.0025} \\ &= 317 \\ &= 10\% \text{ attrition } = 31 \\ n &= 317 + 31 = 348 \end{aligned}$$

4.7 Sampling Procedure

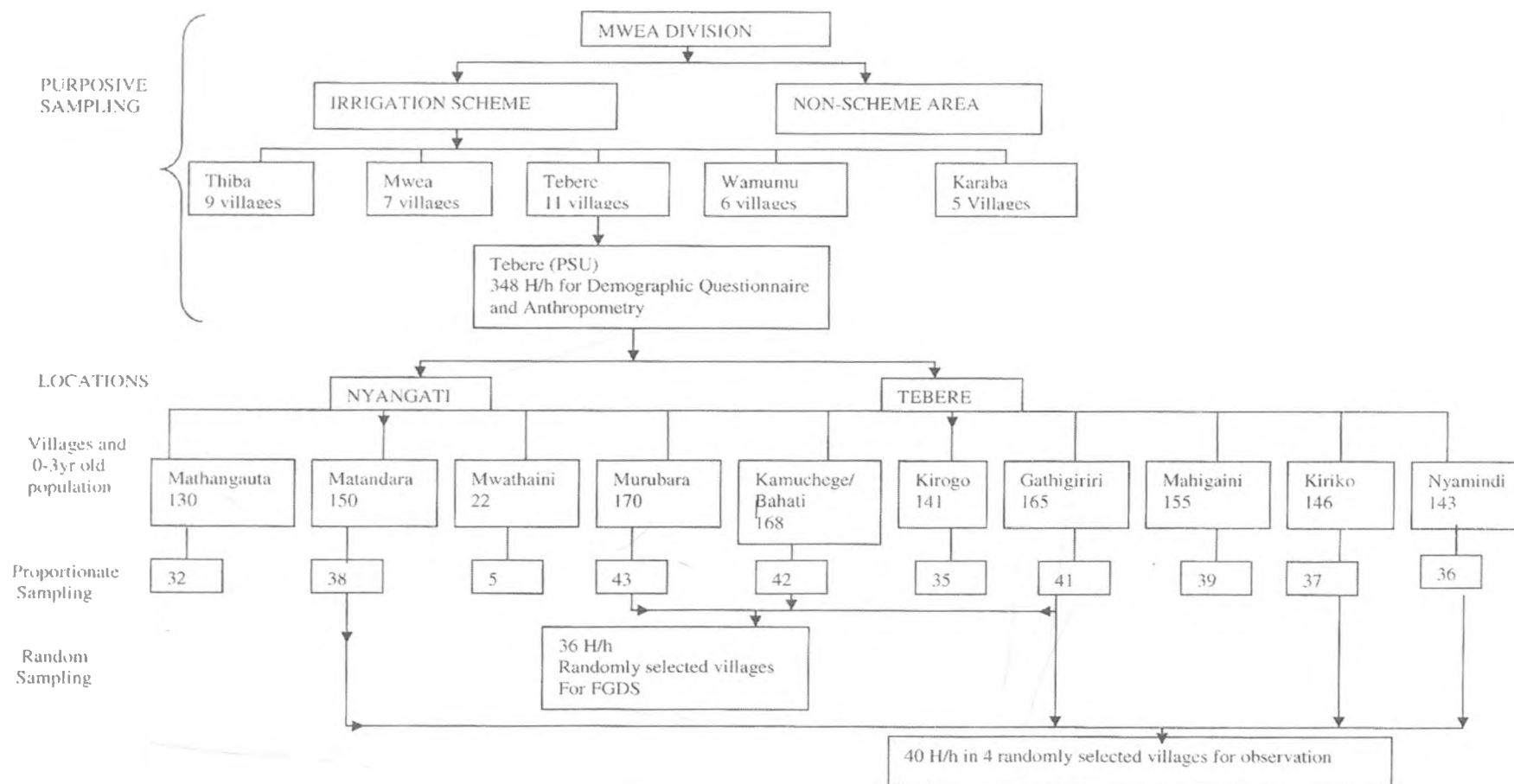
Purposive multistage sampling technique was used in selecting the study sample. Mwea Rice Irrigation Scheme in Kirinyaga district was purposively selected for this study. Main reason for choice of the scheme area was that CBNP wanted to ascertain whether the rice growing population (low socio-economically) is aware of any psycho-stimulating activities and the factors affecting the nutritional status of the children in order to come up with suitable interventions. The scheme area of Mwea has 5 sections namely:- Thiba, Mwea, Tebere, Wamumu and Karaba. Tebere section was purposively selected as the primary sampling unit. Reasons:- Tebere was the first section to be established, it is the largest in size and has the highest population, hence felt to be a proper representative of the scheme area.

Tebere section has 11 villages which are in two locations, Tebere and Nyangati. A census was carried out in the 11 villages to ascertain the number of 0-36 months old children since the clinic medical records were unrepresentative. One village is co-joined with another and therefore the study included 10 villages (clusters). Proportionate sampling was done for fair representation (Fig. 4.0). For the survey, the questionnaire was administered to the whole study population (348 households). Anthropometric measurements of weight, height and age of children aged 0-36 months in these households were also taken. From the 10 clusters, 4

clusters were selected at random for household observation. 10 households with a 0-36 month old child were randomly selected from each of the 4 clusters to give a sample size of 40 households. Three clusters were randomly selected for focus group discussions and from each of these, 12 households with a 0-36 old child were randomly selected to give a sample size of 36 mothers.

For the qualitative survey, a systematic random sampling of households was used for children aged 0-36 months from each village. Starting at a central position of each village, three households were skipped to obtain one with an eligible child whose mother (respondent) had lived in the study area for at least six months. If a household had more than one eligible child, the index child was selected by simple random sampling. This was to eliminate bias. The detailed presentation of the sampling procedure is diagrammatically shown on Fig, 4.0.

Figure 4.0: Schematic representation of the sampling procedure



4.8 Data collection tools

4.8.1 Questionnaire

A pretest structured questionnaire (appendix 1) was used in the study to collect information on:

- ◆ Demography, housing and sanitation, health care practices, maternal and childcare activities, alternative caregivers, time-saving methods in childcare, psychomotor activities and anthropometric measurements.

This questionnaire was administered to mothers of children in the selected households.

- ◆ Anthropometry

A salter scale calibrated from 0-25 kg with 100g divisions

A lengthboard or infantometre

Plastic pants with harness for supporting child when weighing

- ◆ Child health card

For verifying the child's age

To establish if a child had received complete immunization for their age.

To assess frequency of clinic for growth monitoring.

- ◆ Psychomotor development tools

Toys: car, ball and shaker

A child's dress/shirt with front buttons

Size 1 pair of shoes (was disqualified for testing)

- ◆ Observation

Pretested observation schedule (appendix 2)

2 Stop clocks per enumerator to facilitate concurrent timing of children activities

- ◆ Focus Group Discussion (appendix 3)

A pretested focus group discussion guide

4.8.2 Procedure for Taking Anthropometric Measurement

Height and weight (anthropometric measurements) together with the data on age and sex were used to assess the nutritional status of the 348 study children. The procedures followed for taking anthropometric measurement are as described below or in appendix 6 (United Nations, 1986).

4.8.2.1 Weights of Children

Dressed very lightly and in plastic pants, the children were weighed using a salter scale that was suspended by a hook on the weighing scale (appendix 7). The weights were taken to the nearest 0.1kg and measurements were taken twice and average computed.

4.8.2.2 Lengths/Heights of children

For children less than 24 months, length was measured in a supine position using length board (Appendix 8) that had a fixed head rest and movable foot piece placed on a flat level surface. Maximum attention was given to maintain the subjects head in an upright position with legs stretched fully and feet at right angles with the legs. The height of children 25-36 months were measured using an upright length board placed on a flat surface with the child's heels together. The subject's heels, buttocks and upper back were in contact with a graduated board and sliding headpiece touched the crown of the head. The length/height measurements were taken twice to provide an average and were given to the nearest 0.5 cm. For both, a cut-off point of -2.0 sd was used for stunted children (UN, 1986; Quinn,1992).

4.8.3 Determination of socio-economic status.

Information was collected from observation on the type of housing the respondents lived in. A welfare index, social-economic index (SES) was created and used in the analysis of socio-economic status of the households in the study area.

SES was categorized into three groups low, middle and high regarding the quality of the housing facilities. SES disregarded roofs and floors of the houses and only considered walls of the houses since 99.4 % of the population had corrugated iron sheets on their roofs and 99.7% had earth floors. Mud and mud brick walls were categorized together and given a score of 1, timber was given a score of 2 and stone given a score of 3 (where 1 represented low, 2 middle, and 3 high SES).

Through frequencies, the percentages of the various categories were obtained and then multiplied by the corresponding scores. Each was divided by the total population of 348 to illustrate the proportion that was low, middle or high.

4.8.4 Diarrhoea experience

Diarrhoea was defined after explaining to the mothers what a diarrhoea episode means. One diarrhoea episode = 3 or more loose stools per day, (WHO, 1998).

4.8.5 Assessment of psychomotor performance

Psychomotor performance assessment was done in multiple ways to facilitate documentation of achievement of motor and cognitive aspects. Frequencies, associations and chi-square were some of the statistics used in this analysis.

1. Three year old children's gross motor, fine motor and cognitive abilities were tested by ability to jump a short distance into the air, ability to unbutton child's front shirt or dress buttons and ability to differentiate between neck and chest respectively. This was in reference to Steinberg, (1991), where the three year old children are said to accomplish the activities better than the younger children (Appendix 4). The children were put into three groups and each group given a different activity. A psychomotor index PI represented ability to jump, score of 1, ability to unbutton front shirt/dress buttons a score of 1 and ability to differentiate between neck and chest a score of 1. A child was given a score of 1 if he managed to perform and a score of 0 if he was not able to perform. If the able group in any category was above 50%, the overall score was 1 which was translated as normal or achievement of skill but if the group had below 50%, the overall score was zero which translated into non-achievement or delay in milestone achievement. Analysis included associations with some selected child characteristics.
2. A descriptive analysis was done when children were provided with toys. The toys included a car, a ball and a shaker. The shaker was multicoloured and was purposely used on the 0-6 months old children to assess on the abilities to localize sounds and also if they could follow the direction of an object (Muir and Fied, 1979). The three toys were also used with the rest of the children to test for alertness, motor responses, facial expressions or sounds. A response index (RI) was created for analysis of psychomotor abilities. Those children who responded to the toy were given 1 and those who did not respond or feared got 0. RI was categorized such that the group that scored above 50% scored 1 implying achievement and any group that scored below 50% scored 0 implying non-achievement.
3. The importance of play and teaching of skills was demonstrated by childlook which portrayed the child as active, friendly and reserved. Child look index (chli) was created for the analysis of psychomotor achievements with a score of 1 and reserved a score of

zero implying non-achievement. Importance of play and teaching of skills was also demonstrated in other psychomotor skills.

4. Tests on psychomotor achievements and nutritional status of the study children were done to determine the associations.
5. Associations between children confined indoors and psychomotor achievement were determined.

4.9 Phase II of Data collection

4.9.1 Observation procedure

In the 2nd phase of the survey, data on time allocation for different childcare activities was collected on a sub-sample of 40 households. One-day (11 hours) observation was continuously done between 7 a.m and 6 p.m. Consent had been obtained but the actual date of research was not disclosed. All the childcare activities performed by the caregivers over the observation period were timed and the time recorded on the time record sheet (appendix 2). Each enumerator had two stop clocks to facilitate concurrent timing of activities as they occurred. Activities were categorized as complete activities or incomplete activities. Incomplete activities were those activities that were either going on by the time observation started, or were left going on at the end of the day. The incomplete activities were marked with an asterisk (*) on the time record sheet. The caregivers resting time was also timed and recorded. All other activities performed by the mother (including those not related to childcare were also recorded but not timed.

The observation session was felt necessary as it helped:

- Establish time allocation for the various childcare activities
- Capture the actual childcare activities from the maternal activities and time them as they were performed during the observation session.

4.10 Focus Group Discussion

Three focus group discussion sessions were conducted at different times after the household interviews. This was done with mothers of children aged 0-36 months to verify the information collected through the questionnaire and also to try and generate additional information related to the issues that were being investigated. Three clusters randomly selected from the ten study clusters provided 12 study households that is, each (12 mothers of 0-36 months old children) for the 3 FGD sessions. Mothers were invited in advance (a week earlier) to an identified, suitable

and accessible place for all. An FGD guideline questions was used to facilitate the discussion. The FGD meeting lasted between 1- 1 1/2 hours and was conducted at the time most convenient to all mothers to allow maximum participation. The principal researcher was the moderator in the three sessions with the field assistants alternating as recorders but all facilitated in the discussion.

4.11 Data Quality Control

Pretesting of the questionnaire, observation schedule and focus group discussion guideline was done during the pilot study. This was to ensure practicability and minor changes were done. Counter checking of the filled questionnaire was done every evening by the researcher for completeness and clarity of entries. Anthropometric measurement readings were done twice to avoid inter and intra observer errors. Data was cleaned and edited before analysis was done.

4.12 Problems encountered

Some of the problems that were encountered in the process of conducting this survey were:-

1. The study coincided with the planting and weeding season such that frequent absenteeism of target mothers was experienced. Most women in the study area seek casual work in the farms, an incidence that made it impossible to stick to the systematic method of sampling. Majority of children in the study area are either left on their own at home or with other caregivers such as siblings, neighbours, grandmothers. These problems therefore made this study deal with any 0-3 year old child whose mother was available.
2. Inter-Village communication was difficult especially with the rains which made roads impassable by foot or *boda bodas* which are the major means of transport.

4.1.3 Data Analysis

Data was coded and then progressively entered into the computer. SPSS software version 10 was used. The Epi-info programme was used to convert raw anthropometric data (weight and height) together with child age into nutritional indices (WAZ, HAZ and WHZ). Data was thereafter cleaned (running frequencies of all non-continuous variables and mean values for continuous variables) and edited. The nutritional indices were then expressed as Z- scores, relative to the International Reference Population (NCHS/WHO) to standardize the distribution.

Based on the z-scores, children were classified as wasted (WHZ < -2.0 z-scores), stunted (HAZ < - 2.0 z – scores) and underweight (WAZ < -2.0 z-scores).

The methods used in the analysis include descriptive analysis, Chi-square and Pearsons correlation to assess the level of significance between proportions. A p-value of less than 0.05 ($p < 0.05$) was taken as significant. Descriptive statistics including percentages, crosstabulations, frequencies, tables, graphs were used to describe the various study variables in the population.

CHAPTER FIVE

5.0 RESULTS

5.1 Social demographic characteristics

The study covered a total of 348 households with children 0-36 months of age. Average household size was 4.7 persons. The total population covered was 1640 of whom 422 (25.7%) were children below 5 years of age. The demographic characteristics of the study population is summarized in Table 1.

Table 1: Distribution of study population by selected demographic characteristics

Characteristics	Households
Study households	348
Total population studied	1640
Average household size	4.7 (sd=1.98)
Under five year old children	422 (25.7%)

5.2 Characteristics of women interviewed

5.2.1 Marital Status

Majority of the mothers interviewed were in monogamous marriages (78.2%) with only 1.7% in polygamous marriages. Slightly over a tenth (13.2%) of the population were of single mothers (unmarried). Widowed or divorced mothers were 0.9% and 6.0% respectively. Majority of the households (86.6%) were male headed with only 14.4% headed by females.

5.2.2 Age and Education

Most of the mothers (87.8%) were between 20-40 years and only 3.5% were above 40 years of age. The mean age of mothers was 24 years. The bulk of the mothers (84.8%) had only primary school education, 12.6% had secondary education while 2.6% had no formal schooling. The literacy level was higher (95.5%) among the middle category age group (20-39 years) than among the younger and older mothers. The difference in maternal education with age was statistically significant ($X^2 = 37.5$; $P < 0.01$).

5.2.3 Occupation and Religion

Subsistence farming was the commonest occupation (57.8%) for the study mothers. However, 26.4% of the mothers also reported that they engaged in casual work to subsidize household income. The main explanation was that their land was not sufficient to meet their household needs. Slightly over a quarter (26.4%) of the population had no land of their own and simply worked as casual labourers in the rice and horticultural fields. Less than a tenth (8.9%) of the study mothers were involved in small scale businesses like running small retail shops or vegetable hawking. The proportion of women in formal employment was negligible (1.1%), and the remaining 5.7% were housewives. Christianity is the dominating religion in the study area with 92.8% of the respondents as Christians and 7.2% had no specific religion. The characteristics of the respondents are illustrated on Table 2.

Table 2: Distribution of households by maternal characteristics and household head

Maternal Characteristics (N=348)		n	%
Age group:	<20 years	30	8.7
	20-29 years	215	62.5
	30-39 years	87	25.3
	>40 years	12	3.5
Education Level:	None	9	2.6
	Primary	295	84.7
	Secondary	44	12.6
Occupation:	Formal Employment	4	1.1
	Self employment	31	8.9
	Subsistence farmer/casual worker	201	57.8
	Casual Labourer	92	26.4
	Housewife/Farmer	20	5.7
Marital Status:	Single	46	13.2
	Monogamous	72	78.2
	Polygamous	6	1.7
	Widowed	3	0.9
	Divorced/Separated	21	6.0
Household Head:	Male	298	85.6
	Female	50	14.4

5.3 Characteristics of the Study Children

The distribution of the study children according to age and gender is shown on Table 3. The mean age of the study children was 16.2 months (S.D = 10.1) and more than half of the children (58.1%) were below 18 months. There were 170 boys and 173 girls giving a male female ratio of 1:1.

Table 3: Distribution of Study Children by gender and age

Age in months (N=348)	Males n = 170 (49.56%)	Females n = 173 (50.44%)	Total %
0-12	41.8	41.0	41.4
13-24	34.1	35.5	35.0
25-36	24.1	23.1	23.6

5.4 Housing Sanitation and Hygiene

Most of the households in the study area (99.4%) had iron sheet roofing on their houses. Majority of walls were plastered with mud or mud bricks (96.8%) and many had earthen floors (99.7%). Negligible population, (0.4%) had cemented floors and only 2.9% of the households had stone walls. The kind of housing portrayed a low socio-economic status. Three quarters of the study population (74.4%), were sharing pit latrines and only 25.6% of the households owned the facility. Many of the latrines were found to be dirty or nearly full (67.3%). Slightly below half of the children (48.7%), used latrines. It was reported as well as observed that children generally defecated around the compound. More than half of the households (64.1%) disposed their rubbish in shallow pits. Less than a tenth (7.2%), of the households reported burning their rubbish while 10.3% of the respondents said they fed it to animals.

5.4 Maternal Activities

To assess activities routinely performed, respondents were asked to describe all activities undertaken the previous day. Over a period of 11 hours per day, household observations were conducted. Table 4 shows both reported and observed maternal activities by age of the child.

Table 4: Distribution of households by reported and observed maternal activities by age of the child

Reported and observed Maternal activities	Reported (N=348)		Child age in months			p-value (chi-square)	Observed (N=40)		Child ages in months			p-value (chi-square)
	All ages		0-12	13-24	25-36		All ages		0-12	13-24	25-36	
	n	%	%	%	%	n	%	%	%	%		
Sweeping house	296	85	30.2	38.8	30.0	NS	40	100	33.5	32.4	34.1	NS
Preparing breakfast	278	80	33.0	33.7	33.3	NS	40	100	40.9	32.2	26.9	NS
Feeding child	244	70	70.7	18.1	11.2	0.014*	28	70	78.4	18.5	3.1	0.008*
Washing child's clothes	226	65	43.4	35.8	20.8	NS	24	60	40.7	32.6	26.7	NS
Breastfeeding	209	60	79.1	19.0	1.9	0.001*	32	80	80.1	18.1	1.8	0.002*
Washing family clothes	209	60	30.1	33.7	36.3	NS	38	96	33.1	33.5	33.4	NS
Preparing supper	209	60	35.8	37.2	22.0	NS	39	98	35.2	34.2	30.1	NS
Bathing child	191	50	43.9	41.0	15.1	NS	33	82	43.5	33.8	22.7	NS
Cleaning utensils	156	45	32.6	38.0	29.4	NS	40	100	33.1	33.5	33.4	NS
Going to the market	104	30	29.9	43.7	26.4	NS	33	62	30.5	33.2	36.3	NS
Resting	35	10	20.1	30.9	49.0	NS	17	42	34.0	31.9	34.1	NS
Boiling drinking water for child	17	5	45.1	30.1	24.8	NS	40	100	78.2	18.9	2.9	0.006*

NS not significant at $p < 0.05$

*Significant at $p < 0.05$

Of the maternal activities reported and observed, feeding and breastfeeding were significant with the age of the child. Boiling drinking water for the child although reported by very few as childcare activity was observed in all households and was significant with the age of the child.

Table 5: Distribution of Observed (not reported) Maternal Activities by Age of the Child (N=40)

Observed maternal activity N=40	All ages		Child's age in months			P-value
	n	%	0-12 %	13-24 %	25-36 %	
Holding child	32	81	79.8	18.1	6.1	<0.05*
Looking for firewood	32	79	20.2	25.8	54.1	NS
Cooking for child	27	68	45.4	33.1	21.9	NS
Carrying child	24	60	40.9	39.8	19.9	NS
Talking with child	8	21	22.3	32.3	45.2	NS
Playing with child	5	12	20.3	20.3	45.8	NS

NS – Not significant at $p < 0.05$

*significant at $p < 0.05$

For the observed (not reported) activities, holding child was significant with the age of the child. However, though not significant, the other observed activities were noted to be mostly psychomotor stimulating activities to the child.

Table 6: Distribution of reported (not observed) maternal activities by age of the child (N=348)

Reported maternal activity (N=348)	All ages		Child's age in months			p-value
	n	%	0-12	13-24	25-36	
Fetching water	348	100	50.0	35.0	23.0	>0.05
Going to the <i>shamba</i>	261	75	29.5	33.7	36.8	>0.05
Bathing self	174	50	34.8	32.3	32.9	>0.05
Bathing other children	104	30	32.3	35.2	32.5	>0.05
Taking lunch	70	20	50.7	31.2	18.1	>0.05
Changing child's wet clothes	70	20	40.5	37.9	21.6	>0.05
Shopping	35	10	48.0	23.3	28.7	>0.05

The activities reported (not observed) had no significance with the age of the child ($p > 0.05$).

5.5 Childcare Activities

From the listed maternal activities mothers were told to list activities perceived as childcare activities. Maternal activities perceived as childcare activities were ranked as follows: Cooking for the child (87.4%), feeding child (85.6%), bathing child (72.6%) washing child's clothes (69.5%) and breastfeeding (64.9%). Mothers were asked to rank the childcare activities in order of importance. Majority, (84.2%) ranked feeding child as the most important childcare activity followed by preparing food for child (74.1%) breastfeeding (60.4%) bathing child (56.3%) and bathing child's clothes (56.0%). Table 7 illustrates the household ranking of both reported and the important childcare activities.

Table 7: Distribution of households by reported and important childcare activities

Reported childcare activities (N=348)	% ranking of childcare activities by households		Reported important childcare activities N=348	% rank of important childcare activities by households	
	n	%		n	%
Cooking for the child	304	87.4	Feeding child	293	84.2
Feeding child	297	85.6	Cooking for child	258	74.1
Bathing child	252	72.6	Breastfeeding child	210	60.3
Washing child's clothes	242	69.5	Bathing child	196	56.3
Breastfeeding	226	64.9	Washing child's clothes	196	56.3

Feeding and cooking for child are the most popular childcare activities as is illustrated by both reported and important childcare activities (Table 7). Cross tabulation between important childcare activities and maternal characteristics (age, education level, occupation and marital status) was however not significant with chi-square and correlation tests.

To establish if there was any relationship between childcare activities and the age of the child a cross tabulation between the two is presented on Table 8.

**Table 8: Distribution of reported childcare activities by age of the child
(N=348)**

		Age of the child			Chi-square	Correlation
		0-12 (n=142)	13-24(n=120)	25-36(n=83)		
Breastfeeding	Yes	132(58.9)	80(35.7)	12(5.4)	.026*	.012*
	No	10(8.3)	40(33.1)	71(58.7)		
Washing child's clothes	Yes	110(46.2)	76(31.9)	52(21.8)	.048*	.032*
	No	31(29.2)	44(41.5)	31(29.2)		
Cooking for child	Yes	120(39.9)	108(35.9)	73(24.3)	NS	NS
	No	22(50.0)	12(27.3)	10(22.7)		
Bathing child	Yes	104(41.6)	84(33.6)	62(24.8)	NS	NS
	No	38(40.4)	36(38.3)	20(21.3)		
Feeding child	Yes	117(39.7)	107(36.3)	71(24.1)	NS	NS
	No	25(50.0)	13(26.0)	12(24.0)		

NS –Not significant at $p < 0.05$

In Parenthesis – percentages.

*Significant at $P < 0.05$

Breastfeeding and washing of Childs clothes were found to be significant with the age of the child on the reported childcare activities.

5.6 Time spent on childcare activities

To assess the time allocation for childcare activities respondents were asked to rank the time allocation for the suggested childcare activities. The result is given on Table 9.

Table 9: Distribution of households by reported most-time consuming childcare activities

Reported most time consuming childcare activity	N=348	%
Washing child's clothes	221	63.5
Cooking for child	65	18.7
Breastfeeding	26	7.5
Feeding child	22	6.3
Bathing child	14	4.0

Washing child's clothes was reported by (63.5%) of the population as the activity taking the longest time while bathing the child was indicated to take the least time (4.0%).

Observation of household activities was carried out on a sub-sample comprising of 40 households. This was to ascertain on the reported childcare activities and the time allocation for them. All the maternal activities were recorded and the childcare activities timed from 7.00 am in the morning to 6.00 pm in the evening. The computed mean time for the activities is presented on Table 10.

Table 10: Distribution of households by observed childcare activities by mean time per day

Observed timed Childcare Activities	n = 40	Mean time (minutes)
Child playing with 'others'	33	135.42
Caregiver resting	40	121.88
Child sleep	33	91.58
Food preparation	38	88.21
Child playing alone	39	84.97
Holding child	25	53.52
Carrying child	34	50.10
Care of clothes	34	48.41
Playing with child	36	34.58
Breastfeeding	23	34.17
Feeding child on solid food	36	31.83
Feeding child on liquid food	39	22.00
Teaching child	23	17.48
Bathing child	32	13.41
Discouraged from eating dirt	13	4.54
Talking with child	18	3.6

By observation and timing, it was noted that child playing with others was the most time-consuming activity. This activity took an average 135.4 minutes for most caregivers. The other childcare activities that also took a lot of the mother's time were food preparation

(88.2min), holding child (53.5 min) and carrying child (50.1min). Teaching child, bathing child, discouraging from eating dirt and talking with child took the least time, less than 20 minutes. The caregivers idle time was translated into rest time for this particular day which she attributed to the fact that the day was underutilized by not going to the *shamba*.

To determine the association of time spent on child care activities and the age of the child crosstabulation results are presented on Table 11.

Table 11: Distribution of mean childcare time per activity per day per child's age

(N=40)

Activity	Mean time in minutes per day for age			Correlation value	P-value (significance)
	0-12 (n=11)	13-24(n=16)	25-36(n=13)		
Child playing with others	51	154	200	.508	<0.041*
Caregiver resting	62	130	170	.517	<0.022*
Child asleep	135	89	50	-.409	<0.035*
Food Preparation	61	120	83	-.066	NS
Holding child	67	57	37	-.423	<0.048*
Carrying child	62	72	20	-.309	NS
Washing child's clothes	57	42	40	-.110	NS
Playing with child	26	40	38	-.086	NS
Breastfeeding	52	30	21	-.425	<0.025*
Feeding child on solid food	3	43	56	.323	<0.014*
Feeling child on liquid food	16	26	24	.114	NS
Teaching child	8	24	21	.109	NS
Bathing child	20	17	15	-.096	NS
Discouraging from eating dirt	3	6	4	.066	NS

*Significant at P<0.05

NS –Not significant at p<0.05

Breastfeeding and holding took significantly more time during the first 12 months of a child's life. Washing child's clothes although not significant is taking more time at the same age. Chi-square test on time spent on childcare activities was not significant with maternal age and maternal characteristics.

5.7 Psychomotor enhancing activities

Respondents were asked to state at what ages their children attained the development milestones (this was to be given only if the child was at that stage or not gone beyond 6 months of achieving the skill). Listed in Table 12 is a comparison to Schiamberg, (1991) achievement ages.

Table 12: Distribution of children by milestone age of achievement

Developmental Milestone (N=348)	Schiamberg's achievement age (months) (Expected age*not the std)	Study children achievement age (months)	Number of children who had attained (n)	% achievement of study children by the given time
Balancing head	4	4	318	91.4
Grasping firmly with hand	4	5	205	59.0
Sitting without support	8	7-8	270	77.8
Crawling	8	8-9	241	69.4
Walking a few steps	10-13	10-13	200	57.5
Speaking 4-5 words	10-13	10-14	91	26.2

Balancing head, sitting without support and crawling were the activities achieved relatively in time by the majority of the study children. Speaking was the least achieved by the expected time (26.2%).

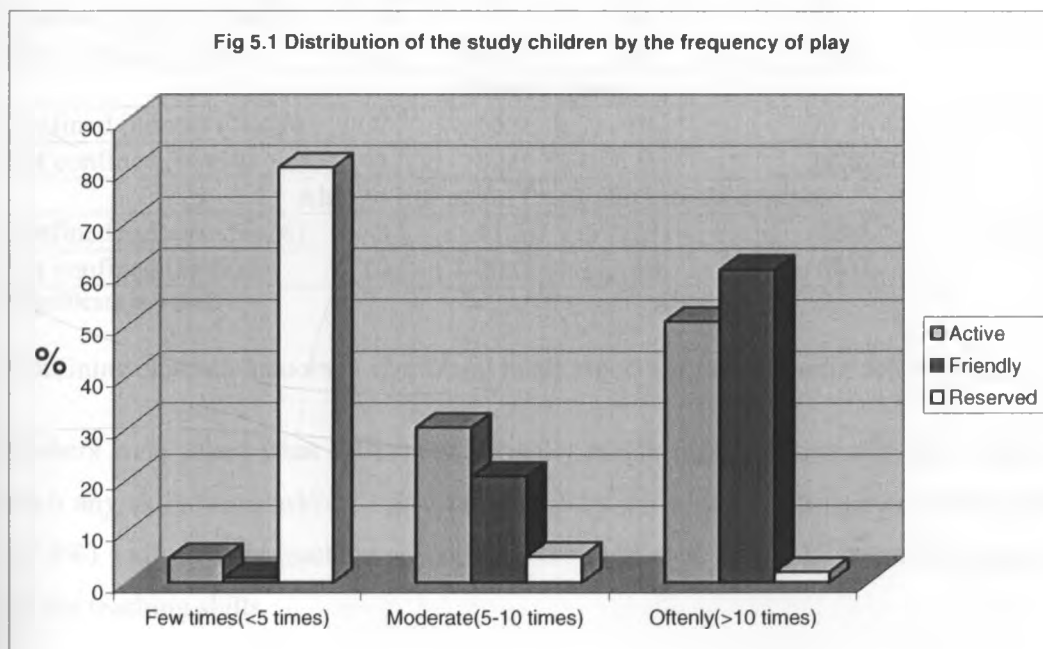
Study mothers were asked to indicate what age they felt play was important for their children. Majority (53.6%) indicated between 1-3 years whereas the rest distributed their preference in various age categories of between 0-18 years as presented on Table 13.

Table 13: Distribution of households by suggested age for play in years (N=348)

n	Households		Suggested age (years)
		%	
34		9.8	0-1
94		27.1	1-2
92		26.5	2-3
68		19.6	3-4
41		11.8	4-5
14		4.0	5-12
5		1.2	12-18

During interview phase, 'child look' was assessed by recording the first impression the enumerator got from study children. This was restricted to children aged 13-36 months (71.4%). The child look was based on how active, friendly or reserved the child appeared. The child look index was cross tabulated with various variables including frequency of play and the skills taught to the study children. Chi-square test on child look and frequency of play and teaching skills was significant (Figures 5.1 and 5.3) ($p < 0.01$).

Figure 5.1 Distribution of the study children by the frequency of play



Those children that were played with for least time turned out to be more reserved than those who were played with more frequently.

Mothers were asked if they usually restricted (confined) their children indoors. A small proportion of the population (21.3%) indicated restricting their children indoors especially if

there was no alternative caregiver to attend to them. The reasons they cited included:- To give mother time to work (30.3%), to avoid accidents and child dirtfying themselves (12.9%) child too young (4.0%), avoid bad influence (1.1%), to facilitate growth (12.8%) and to gain more cognitive growth (29.9%). To assess what age category was more affected by the restrictions; cross tabulation between those who restricted children indoors and their children's ages was done. The result indicated that 0-12months age category were more affected (72.1%). To determine the association of confining children indoors, cross tabulation between the study children confined indoors and those not confined (from two and a half years) was done with psychomotor abilities:- ability to jump, ability to unbutton front shirt/dress buttons and ability to differentiate between neck and chest. Table 14 illustrates the significance between the variables.

Table 14: Distribution of children by confinement and psychomotor achievements (N=76)

Able to differentiate between neck and chest					
	ABLE		UNABLE		Chi-square value
	n	%	n	%	
Confined indoors (N=26)	2	7.7	24	92.3	.001*
Not Confined (N=50)	12	24.0	38	76.0	
Able to Jump					
Confined indoors (N=26)	7	26.9	19	73.1	.044*
Not confined (N=50)	41	82.0	9	18.0	
Able to unbutton front shirt/dress buttons					
Confined indoors (N=26)	3	11.5	23	88.5	.015*
Not confined (N=50)	10	20.0	40	80.0	

*Significant at p<0.05

Confining children indoors is significant in all aspects of psychomotor achievement.

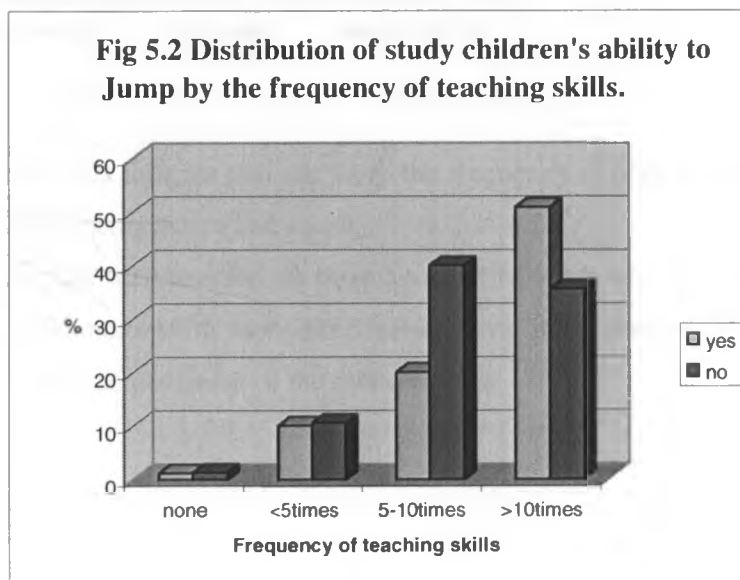
Mothers were asked what skills they normally taught their children and those who did not teach any skills were asked to give reasons. Slightly more than a quarter of the population (27.8%), indicated not teaching any skills to their children. Table 15 shows the reasons given for not teaching skills.

Table 15: Maternal reasons for not teaching skills to their children

Reason	Percentage (N=97)
Lack of time	83.7
Baby too young	9.3
Teaching highly regarded	7.0

The remaining 72.2% of the population indicated teaching some kind of skill to their children. Skills said to be taught to the children included:- teaching child how to speak (63.0%), jumping (10.3%) counting and drawing (6.0%), walking (9.3%), sitting and singing 4.1%, sweeping (1.6%) , carrying dolls (2.5%) and how to feed (1.2%). The respondents whose children were not taught skills were found to have a negative effect on achievement of some developmental milestones. For example as illustrated in Figure 5.2, the more frequent the skills are taught the better the jumping ability.

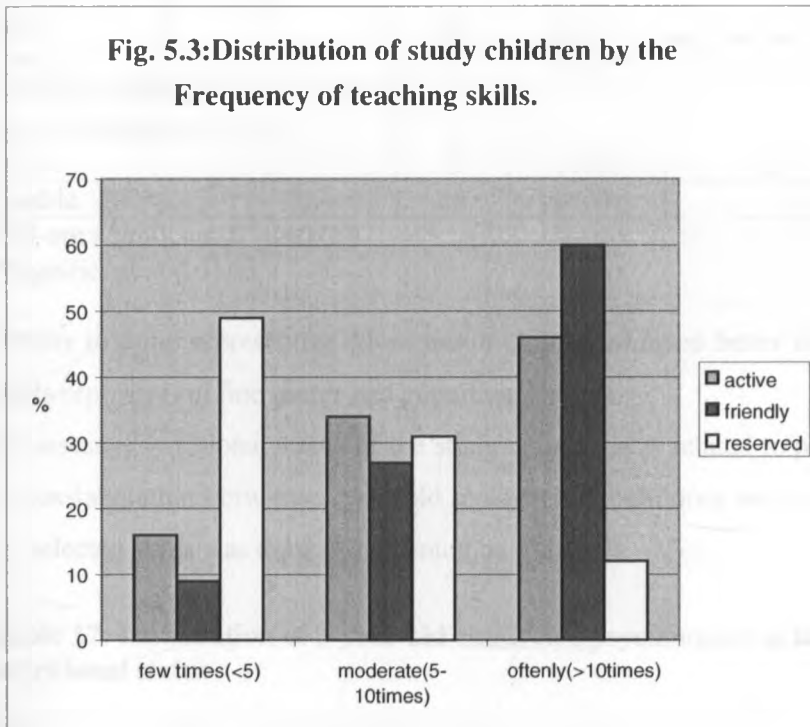
Figure 5.2: Distribution of study children’s ability to jump by the frequency of teaching skills.



Those mothers who taught skills to their children were asked to tell the frequency of teaching the skills per given day. More than half of the population (60%), indicated few times

(<5times), 26.6% indicated moderate times (5-10 times) and the remaining 13.4% indicated many times (>10 times). A crosstabulation between frequency of teaching skills and 'childlook' indicated that fewer frequencies of teaching skills resulted into more reserved children compared to the more friendly and active children who received more frequent teaching (Fig. 5.3).

Figure 5.3: Distribution of study children by the frequency of teaching skills.



Figures 5.1, 5.2 and 5.3 indicate that the more the frequency of play and teaching of skills, the better the child in being active and social.

Psychomotor and age was assessed on three year old children who are said to accomplish some selected psychomotor skills more effectively (Harris and Liebert, 1992).

Table 16 illustrate the achievement of the said activities.

Table 16: Distribution of the 3-year-old children by psychomotor abilities

Psychomotor Activity	Ability level		Score	Chi-square value
	n	%		
Ability to unbutton front shirt/dress buttons (n = 34)	8	23.5	0	.025*
Able				
Unable	26	76.5		
Ability to jump (n = 34)				
Able	22	64.71	1	NS
Unable	12	35.29		
Ability to differentiate between neck and chest (n = 34)				
Able	6	17.64	0	.014*
Unable	28	82.36		

NS-not significant at (p<0.05)

*Significant at p<0.05

Ability to jump representing gross motor skill is achieved better in comparison to the other skills representing fine motor and cognitive abilities.

To assess if nutritional status of the study children was related to psychomotor performance, a crosstabulation between 3 year old malnourished children and psychomotor achievements on selected skills was done as presented on Table 17.

Table 17: Distribution of 3-year-old children's psychomotor achievements by nutritional status

	Ability to differentiate between neck and chest (n=34)		Ability to jump (n=34)		Ability to unbutton (n=34)		Statistical significance (chi-square)
	Able	Unable	Able	Unable	Able	Unable	
Stunted (n=10)	1(2.9)	9(26.5)	3(8.8)	7(20.6)	2(5.9)	8(23.5)	NS
Under-weight (n=12)	3(8.8)	9(26.5)	6(17.6)	6(17.6)	4(11.8)	8(23.5)	NS
Wasted (n=12)	5(14.7)	7(20.6)	8(23.5)	4(11.8)	4(11.8)	8(23.5)	NS

Though not significant, ability levels in the stunted children were the least (17.6%) compared to underweight (38.2) and wasted (50.1) levels.

To assess the study children response on toys, a participative index (pat) was created to represent:- handling of toys /turning to direction of sound/following toy with eyes had a score of 1, fear of or no response to the toy a score of 0. If the *able* category in any age group was more than 50%, the over all score was 1 implying achievement, but if below 50% the over all score was 0 indicating non-achievement. Table 18 presents the psychomotor responses.

Table 18: Distribution of children by psychomotor responses on toys

Toys Provided	No of children and age	Responses			Score
			n	%	
Rattle	51 (0-6 months old)	Turned to the direction of the sound	41	80.4	1
		Did not turn	10	19.6	
		Followed direction of rattle	38	74.5	1
Rattle	99 (7-36 months)	Did not follow	13	25.5	
		Shook rattle	49	49.5	0
		Feared rattle	21	21.2	
Ball	99 (7-36 months)	Did nothing with toy	29	29.3	
		Played with ball	55	55.6	1
		Feared ball	20	20.2	
Toy car	99 (7-36 months)	Did nothing with ball	24	24.2	
		Moved car or made sound of car	28	28.3	0
		Feared car	33	33.3	
		Did nothing with car	38	38.4	

0-6 months children scored highly in vision and sound localization but the rest of the study children scored average or below average response to the toys.

5.8 Alternative caregivers

Mothers were asked to state the other person who takes care of the child other than themselves, the caregivers ages and education levels. This was in order to assess if the alternative caregivers characteristics affects the psychomotor development and the nutritional status of the study children. Out of the 348 households, 41.7% indicated no alternative

caregiver. In the remaining 58.3% households, though the primary caregiver was still the mother, they had an alternative caregiver. Among the caregivers, the main alternative caregiver was a sibling (41.4%), followed by grandmothers (36.4%), neighbors (20.2%) and house girls (2.0 %). Most of the caregivers (63.1%) were over 12 years of age and majority of them (76.3%) were of primary level of education. 19.7 % of the alternative caregivers had no education at all. Table 19 illustrates the 'other caregivers' characteristics.

Table 19: Distribution of Selected Characteristics of the Alternative Caregiver (N=203)

Caregivers' characteristics		n	%
Relationship with child			
	Sister/Brother	84	41.4
	Grandmother	74	36.4
	House girl	4	2.0
	Neighbour	41	20.2
Age	Under 12yrs	75	36.9
	Over 12 yrs	128	63.1
Education Level:	No education	40	19.7
	Class 1-4	78	38.4
	Class 5-8	77	37.9
	Secondary and above	8	4.0

To assess if the alternative caregivers affected the development milestones of the study children, a crosstabulation between the 'other' caregiver and children who had not achieved some selected developmental milestone by the expected time was done (Table 20).

Table 20: Developmental milestone and presence or absence of alternative caregiver

Developmental milestone not achieved	Other Caregiver	n	% delay rate
Grasping with hands	NO	25	75.7
	YES	8	24.3
Sitting without support	NO	35	64.8
	YES	19	35.2
Crawling	NO	49	62.0
	YES	25	38.0
Speaking 4-5 words	NO	84	51.2
	YES	80	48.8
Walking	NO	62	55.7
	YES	49	44.3

A caregiver index (CARG) represented YES for presence of an alternative caregiver and No for absence of an alternative caregiver. The number of children in each category was denoted by n. It was notable that the percentage delay rate was markedly higher where there was *no* alternative caregiver. Where the mother was the sole caregiver, she may not have had enough time to play, teach or talk with the child because of the many other household chores she had to attend to.

To assess the level of delay in achievement of developmental milestone with the various caregivers, those children who had not achieved developmental milestone at the given time was crosstabulated with the various caregivers. Table 21 illustrates the percentage delay rate on the achievement of the selected developmental milestone by the various caregivers.

Table 21: Percentage distribution of delay rate on developmental milestone by various caregivers (N=348)

Developmental milestone	Expected achievement age in months	% Delay in achievement by the study children	%Delay in developmental milestone achievement by main caregivers				
			Mother	Grand-mother	Sibling	Neighbor	House/girl
Balancing head	4	8.6	76.4	11.8	5.9	5.9	-
Grasping firmly with hand	4	41.0	75.7	9.1	6.1	9.1	-
Sitting without support	8	22.2	64.8	14.8	11.1	9.3	-
Crawling	8	30.6	62.0	16.5	13.9	6.3	1.3
Walking a few steps	10-13	82.4	55.9	18.0	18.0	7.2	0.9
Speaking 4-5 words	10-13	73.8	51.2	22.0	17.1	9.1	0.6
Total				92.2	72.1	46.9	2.8

Delay in milestone achievement appeared greatest where the alternative caregiver was the grandmother and least where it was a house girl.

5.9 Time saving methods in childcare

Respondents were asked to describe any methods that they normally used in order to shorten on the time they spent in some selected household activities. The major time saving methods mentioned were:- Store enough food after harvest to last a few months, buying enough food to last a few days, buy or collect enough firewood to last a week/ buy a sack of charcoal, fetch enough water for a day, prepare food in advance, soak maize and beans, use of energy

saving stoves, cook enough food for a day and feed child while cooking the family pot. The reported time saving methods are presented on table 22.

Table 22: Distribution of households by the reported time-saving methods in selected maternal activities.

Activity	Time Saving Method N=348	%
Looking for food	No time saving method	43.5
	Store enough after harvest to last a few months	55.3
	Buy enough to last a few days	1.2
Looking for fuel	No time saving method	27.4
	Buy/collect enough to last a week	60.1
	Buy a sack of charcoal	12.5
Fetching water	No time saving method	35.7
	Fetch enough for a day	64.3
Food preparation	No time saving method	95.5
	Prepare food in advance	4.7
	Soak maize and beans	0.3
Cooking	No time saving method	75.2
	Use of energy saving stove	6.9
	Cook enough for a day	17.9
Feeding Child	No time saving method	74.4
	Feed child while cooking	25.6

Through the Focus group discussion sessions many respondents (97.0%) felt that their low economic situation could not allow them to afford some of the time and labour saving equipment such as large drums for storing water, energy saving stoves or even affording enough firewood. Chi-square test on time saving methods and nutritional status indicated that those with no time saving methods had more stunted cases (31.0%) than wasting or underweight.

5.10 Nutritional status

Child nutritional status was assessed by anthropometric measurements of weight,height (age was determined from the child's health card). The weight-for-age-age (WAZ), weight-for-height (WHZ) and height-for-age (HAZ) indices were then expressed as z-scores relative to

the international (NCHS/WHO) reference population to standardize the distribution. Based on the z-scores, children were classified according to suggestions by Waterloo (1973), as:- wasted (WHZ < -2.0 z-scores), stunted (HAZ < -2.0 z-scores), wasted and stunted (underweight) (WAZ < -2.0 z-scores). A p-value of less than 0.05 was accepted as statistically significant. Prevalence of child malnutrition in the study area indicated that out of the 348 children studied 18.7% were underweight, 28.2% stunted and 6.7% were wasted. Table 23 shows the distribution of malnourished children by gender.

Table 23: Distribution of malnourished children by gender

Nutritional Status Indicators	Gender %		P-Value
	Boys (n = 60)	Girls (n = 126)	
Wasting	4.2	9.2	0.091
Underweight	11.6	25.9	0.003
Stunting	19.2	36.8	0.000

* *Wasting*: < -2sd WHZ

* *Underweight*: < -2sd WAZ

* *Stunting*: < -2sd HAZ

More girls were malnourished than boys according to the weight-for-age and height-for-age nutritional indicators.

To compare the nutritional status and age, the nutritional indicators, wt-for-ht, ht-for-age and wt-for-age were crosstabulated with the child's age. Chi-square test (Table 24) shows children aged 13-24 months had higher prevalence of stunting (37.5%) compared to 0-12 months (21.9%) and 25-36 months (26.5%).

Table 24: Distribution of Malnourished Children by age

Nutrition Status Indicator	% malnutrition by Age (months)			P-value
	0-12 (n = 62)	13-24 (n = 84)	25-36 (n = 40)	
Wasting	7.3	7.5	6.8	0.732
Underweight	14.8	25	16.9	0.224
Stunting	21.9	37.5	26.5	0.049*

*significant difference at $p < 0.05$

Nutritional status of children was crosstabulated with some selected maternal characteristics. Table 25 compares the nutritional status with the selected maternal characteristics. Children

in households where mothers were aged more than 30 years had better nutritional status compared to those children of younger of mothers (< 30 years). Nutritional status of children of mothers with primary education were worse of than the children of mothers with no education or with secondary education. Children of mothers who were employed had better nutritional status than either farmers or housewives. The difference in these characteristics were however not statistically significant.

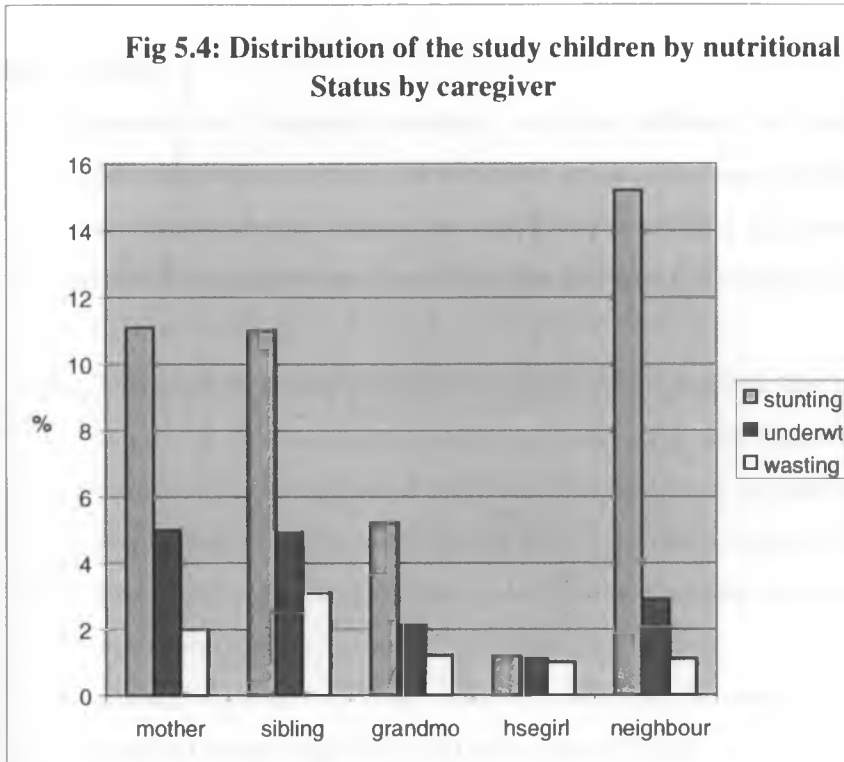
Table 25: Distribution of malnourished children by selected Maternal Characteristics

Maternal Characteristics	Nutritional status		
	% Wasted n = 23	% Underweight n = 65	% Stunted n = 98
Maternal Age In years			
< 30	86.9	67.7	70.4
> 30	13.1	32.3	29.6
Maternal Education			
None	0	1.5	4.1
Primary	78.0	83.1	84.7
Secondary	22.0	15.5	11.2
Maternal occupation			
Employed	0	6.0	8.0
Farmer/casual labourer	65.2	63.2	63.4
Housewife	34.8	30.8	28.6

***Stunting: (< -2sd HAZ) *Underweight: (< -2sd WAZ) *Wasting: (< -2sd WHZ)**

To assess the level of malnutrition of the study children by various caregivers, crosstabulation between nutritional status by caregivers was done. Malnutrition was considered as <-2sd HAZ for stunting, <-2sd WAZ for underweight and <-2 sd WHZ for wasting. Figure 5.4 illustrates malnutrition by various caregivers.

Figure 5.4: Distributions of the study children by nutritional status by caregiver



Overall, households where the alternative caregiver was a housegirl recorded the lowest levels of malnutrition.

SUMMARY

The findings of this study show that care practices of children are not definite. It was noted that some important childcare activities especially those connected to the care of the child during illness were not reported. Childcare activities reported were: feeding, cooking, breast-feeding, bathing and washing child’s clothes. These activities were mainly related to the nutritional status than psychomotor stimulation of the children. Probably CBNP/FLTP’s main objective of dealing with malnutrition at the household/community level could have contributed to the emphasis laid on nutrition enhancing activities rather than psychomotor enhancing activities. This has nonetheless been positive since malnutrition rates are lower than the national malnutrition rates.

The value of psychomotor stimulating activities seems to be unknown. No psychomotor activities were reported as childcare activities but incidentally some psychomotor enhancing activities were noted during the observation sessions.

Key Findings

1. Reported and observed maternal activities differed in that there were cases of unreported activities that were observed. Most of the unreported but observed activities were psychomotor enhancing childcare activities. However, only feeding and breastfeeding child were significant with the age of the child ($p < 0.05$).
2. Childcare activities that took the longest mean time per day included cooking for the child (88.2min), feeding child on both solid and liquid food (53.8 min), and surprisingly holding child and carrying child were unreported and more related to psychomotor development ranked third and fourth respectively. The mean time for breastfeeding, feeding child on solid food and holding child were significant with the age of the child.
3. Stunted children had lower achievements in psychomotor abilities (17.6%) compared to either underweight (38.1%) and wasted (50.0%).
4. More frequencies of play and teaching of skills resulted into higher levels of psychomotor achievements/ abilities by the study children. Confining children indoors was found to have a strong negative effect on psychomotor development.
5. 0-6 months children's sensorimotor development was noted to be normal as indicated by the high achievements in sound (80.4%) and vision (74.5%) responses to the toys. This is further confirmed by the fact that development milestones at the same age especially balancing head (91.4%) were achieved in time. However, the older children's low average (44.4%) response to the toys and delayed achievements in milestone development is showing lack of exposure to the play materials or lack of social stimulation. The three year old children's low level in achievements of fine and cognitive skills is a further indication that social and cognitive skills may be inadequate.
6. House girls, though in very few households (1.1%), were found to contribute more positively to the psychomotor development and nutritional status of the study children.

7. There is lack of time saving methods in the community and the few who are aware of labour-saving devices cannot afford them. Results indicated the community to be social economically poor.
8. Stunting and wasting levels were high among children whose mothers are <30 years and with primary level of education.
9. Malnutrition levels of the study children relatively lower than the national levels, an attribute to CBNP's fight against malnutrition at the household/community level. Prevalence of stunting and underweight was higher for girls than boys. Gender performance in psychomotor development was however not significant.

CHAPTER SIX

DISCUSSION

6.0 GENERAL CHARACTERISTICS

6.1 Population and social demographic characteristics

This study identified most mothers to be married with majority of the households having male household heads. This is in agreement with KDHS 2003, which has identified majority of the households to be male headed. Most study mothers were in the 20-29 years age brackets. Age specific fertility rate have been found to be higher within the age range of 20-29 years in most parts of the world (Rindhuss and Parnell, 1989; NCPD, 1989; Kenya, 1980). It is therefore possible that most mothers in the current study had their young children within this age range, hence they were the majority in the study population resulting in no significant difference in childcare activities with maternal age.

The bulk of the study mothers, (84.8%) had only primary level of education majority having stopped at mid-primary. KDHS 2003 indicates 32.8% of females in central province have incomplete primary education. These low education levels may account for the high ranking of casual labour as a source of income rather than formal employment hence the poor economic status. Similarly the low education levels could also be associated with ignorance in such areas as hygiene and general childcare. Higher education level (secondary) was found to contribute positively to the nutritional status and psychomotor development of the children. High education level of the mothers could be associated with management of available resources in favour of better nutrition, for example economic use of available resources to provide a balanced meal. Furthermore formal education may play a big role in recognition in and value of play and play things hence optimizing this time instead of overburdening the child with domestic chores. This identifies with UNICEF (1992), that education of the mother often explains more variance in childcare and child nutrition than even income.

An average of 57.8% families practiced subsistence farming though majority of these admitted practicing part time casual work in the rice and horticultural farms. This is in line with what has been reported that agriculture is the main source of income for the majority in the rural parts of Kenya (Kenya,1982; Kenya, 1989; (Opiyo, 1993). There was significant correlation between mother's occupation and growth indicators. Children of the mothers who had formal employment were significantly better in nutritional status. This was possibly because mothers could be able to afford better diet, had the know-how and could also afford to employ an alternative caregiver. Levine, (1980) in a study carried out in Mexico found out that mothers with more education interacted more verbally with their children than those with less education. The educated mothers according to Levine also take a more active role in the education and stimulation of their children than the less educated (Kamau, 1994). Most of the psychomotor stimulating activities including play, teaching or talking with the child, though taking relatively less time were noted to be in households where the mothers had higher education levels or had an occupation that was able to generate some income hence were able to employ an alternative house girl.

6.2 Maternal activities

Majority of the study mothers performed almost similar maternal activities among which were fetching water, preparing family meals, sweeping house, childcare activities washing clothes and farmwork. The same was confirmed in the focus group discussions and in the recorded activities during observation. Similarly, other studies have reported the same activities in the rural areas (Basse, 1984; CRSP, 1987; Leslie, 1988). However, this study noted that some activities including health care giving behaviors were not reported possibly because it is not an activity that is done all the time. UNCEF, (1992) and FAO/WHO, (1992) both state that mothers may not report some of the activities they perform since they do not consider them as work. The under reporting of maternal activities may be probably because what the mother considered to be an activity was mainly what was done more frequently and consumes most of her energy and time. Supporting this was holding and carrying child which were not considered as childcare activities as they were performed mostly when the caregiver was at rest or while performing other activities.

6.3 Childcare activities

Surprisingly the study population considered only five activities to be childcare activities namely:- feeding child, cooking for child, washing child's clothes, breast feeding and

bathing. The current study refers the five activities as nutritional enhancing activities since they facilitate more to nutritional status than psychomotor. FAO/WHO, (1992), included other activities like teaching skills and playing with child and described them as enhancement childcare activities since they are intended to enhance growth or further development. Indeed these are direct childcare activities that actually take some caregiver's time and energy to perform. But other activities noted in this study as direct childcare activities but were not reported as childcare activities included holding child, carrying child, playing with child (fondling/caressing), and to a lesser extent teaching and interacting with child. Such in addition to supervising child's toilet are activities Myers, (1992) included in his study. These activities could be regarded as psychomotor enhancing activities since they facilitate the psychomotor and psychosocial development of the child. The fact that the study population regards nutritional enhancement activities as childcare activities but disregards psychomotor enhancing activities may imply population's lack of awareness on psychomotor care and its value. The relatively shorter time allocated to the psychomotor enhancing activities compared to nutritional enhancing activities further confirms this fact. Breastfeeding and feeding child were significant with the age of the child ($p < 0.05$) with more attention accorded to the infants (0-12 months) and attention diminishing with age. This could have been one of the contributing factors to the poor nutritional status of the (12-24 months) old children. There was no statistical significance between childcare activities and maternal characteristics owing to the almost homogeneous characteristics of the study population.

6.4 Time allocation for childcare

Washing of child's clothes was reported as the most time consuming activity by virtue of the fact that one had to go to the river to do the washing there or fetch water for washing and in most cases washing was combined with the family washing. Observation however indicated that cooking for the child took the longest time, apparently owing to lack of proper firewood. Many mothers were noted to use dry maize cobs or maize stalks or any other available dry twigs, which could not hold fire for long. Proper firewood was expensive and was to be fetched from far distances, which was difficult for many mothers.

Of the psychomotor enhancing activities, holding child ranked first which is consistent with Paolisso et. al; (1989) in Embu study- Kenya, where holding the child was the major component of the total care provided by a mother for her infant. Carrying child on the back, an activity not reported as a childcare activity was observed especially with alternative caregivers. Through the focus group discussion, mothers expressed that carrying a child at

the back is just routine activity since they can perform other activities as the child is strapped at the back. Most of the psychomotor enhancing activities are done unconsciously, the study population not really knowing the value of such activities. For example some studies in Steinberg and Belsky, (1991), indicate that among the Kipsigis tribe of Kenya, holding a child on the lap and carrying a child at the back facilitates stronger trunk, buttock and thigh muscles. These are strong features in enhancing some motor development. In this study, sitting and walking as milestones in child development were noted to be attained slightly earlier which could be attributed to some of these activities which are simply considered as routine activities. Holding child as reported in the FGD varied by age of the child. Children were said to be comforted /cuddled more during infancy (0-12 months) than any other time. This is in agreement with Unicef, (1992) that during infancy comforting the child is important for the physical and psychological development but in toddlerhood a child who is frequently held is often more poorly nourished, or shows lower levels of verbal development than more active children.

The average breast feeding time observed in this study was (34.2 minutes) which is inconsistent with that observed in Ghana(50 minutes), Northern Cameroon(56 minutes) and among the poor mothers in Philippines(69 minutes) and far below rich mothers in Philippines(116 minutes) (Levine, 1988). The mothers in this study were from a rural community mainly dependent on subsistence farming and casual labour as their main source of income with very few if any income earning activities (section 5.2.3) . These mothers were generally very poor and from the above results, it appears that poor mothers spend less time breastfeeding than the rich mothers. The time taken to perform childcare activities was however not significant with maternal characteristics.

6.5 Time saving methods in childcare.

From the maternal activities listed, only 10% of the study mothers could afford rest in a given day. The rest of the study mothers were occupied from the time they woke up in the morning to the time they went to bed. In a review of women's time, a factor in the use of child Survival Technologies by Leslie, (1988), it was found difficult especially for the low income rural women to cope with many activities that compete with their time and energy with few if any labour-saving technology to help.

ACC/SCN (1990b), also asserts that the multiple role of many women in poor households as mothers, home managers and community organizers frequently set two of their primary resources namely income and time in conflict. Many mothers pointed out that they were not

aware of time saving methods. Others complained they could not afford the labour-saving equipment. In food preparation and cooking which were seen to take the longest time, (95.5%) and (75.2%), respectively, did not have any time saving methods. The simple time saving methods used, for example cooking of more food to be eaten for more than one meal was somehow a risk to food contamination since the study area is an extremely hot zone and none had cold storage facilities. This could contribute to the poor nutritional status of the older children who are left to feed on left over foods and with no appropriate caretaker to reheat the food properly. Family Health, Growth and Development Report (1986) points out that in the majority of rural areas young children are left unattended for long hours sometimes the whole day where parents are working or doing other things to earn a living. Many mothers however felt that the economic situation in the community could not really make them afford some of the time saving equipment or even some of the basic necessities.

6.6 Alternative caregivers

Mothers were the principal caregivers within this study community. However, in agreement with Engle, (1997), mothers and families cope with the demands of work inside and outside households by using alternative caregivers. Siblings acting as caregivers in this study were between ages 2-12 years. This agrees with the contention that in most developing countries children at age 3 or 4 are usually not really cared for but are caregivers themselves to the younger siblings (Engle and Patricia, 1992). This study found out that there was a high rate of stunting, underweight and wasting owing to children being cared for by these young siblings. Likewise, neighbours and grandmothers may not have the know-how or the commitment for appropriate childcare. For example in Guatemala, when working mothers did not have a good alternative care giving system, their children were more malnourished than children of working women with good alternative care giving systems (Engle, 1991).

It was notable that housegirls were only found in households where mothers had higher education level, hence involved in an economic activity. However, the households with house girls were relatively few and the children in these households were found to do better in both nutritional status and psychomotor development.

In most cases an educated mother had the know-how of nutritional care and could afford some appropriate foods and at the same time would be in a position to instruct the housegirl on appropriate childcare. The housegirl on the other hand caters for the child when the

mother is busy. This may indicate that young adults would do better as childcare substitutes more so if they are equipped with knowledge or know-how about childcare.

6.7 Nutritional status

Prevalence of wasting was low as is usually found in non-emergency situations (Jooste et al, 1997). Acute malnutrition (wasting) measured by weight-for-height and indicated by inadequate food supply prior to and during the study period was slightly higher(6.7%) than the national level(6.0%) (KDHS, 2003). However, fewer children were wasted compared to either underweight or stunting.

Stunting is generally associated with low social-economic status (Jooste et. al; 1997) which is the case in this study. Prevalence of stunting is lower in the first year of life rising notably in the second year of life. This is similar to findings of a survey conducted in the year 2000 in Tharaka district (ANP, 2000). Rise in stunting levels during the second year though not determined from this study could be attributed to poor weaning and complementary feeding practices. The decreasing malnutrition levels after age two could be explained by the fact that as the child grows older, he/she has access to different foods than a younger infant who depends on only what is provided by the mother or caregiver (Meme, 1996).

For nutritional status and psychomotor abilities, it was apparent from the results that malnutrition affects psychomotor performance. Research in the past decade has documented significant association between malnutrition and the cognitive and behavioral development of children (Allen et. al; 1995). Though not significant, psychomotor abilities were lower in stunting than either underweight or wasting. This study also found that prevalence of malnutrition was higher for girls than for boys. A study carried out in Nyakach (Kisumu) on (Opiyo, 1993) found higher malnutrition prevalence for boys had than girls hence the two studies differ in this finding. In many African communities male children are preferred to girls “ a male child is looked upon as a dynamic element in the lineal structures and though a potential source of wealth, a female child is regarded as exporter of fertility from her parent lineage to the lineage of her husband”(Ominde, 1987). The cultural preference may therefore influence the caring behaviour the child receives. This gender disparity however did not show any significance with psychomotor abilities.

6.8 Psychomotor development

It is apparent from the reported maternal and childcare activities that psychomotor development activities are not known in the study area. But on the other hand the observed

activities came out with some unreported childcare activities, which the researcher was able to identify as psychomotor enhancing activities. These activities according to the study population are just routine activities for example holding child was an activity done while the mother was not busy with other activities and carrying child was an activity said to be done concurrently with other activities. To the researcher, these two activities could have contributed to the higher achievements in gross motor skills. Experiments done by Kilbride and Super, (Steinberg, 1991) indicate that holding or carrying child at the back helps to develop and give firm support to the trunk, thigh and buttock muscles hence ability by the child to support themselves earlier. This is evident with developmental milestone of sitting, walking and crawling that were achieved relatively earlier or in time with the expected time. Higher achievements in the ability to jump could also be attributed to the same. High achievements in 0-6 months old children responses to sound, vision and ability to balance head in time are indicators that children are born normal but inability by older children to achieve in some of the selected psychomotor activities or poor handling of toys indicates there is a component of development that is lacking as the children grow up. Steinberg, (1991) asserts that motor development can be delayed by emotional and sensory deprivation and can be speeded up within limits by extra physical stimulation. In this study cognitive stimulation was minimal as was indicated by the kind of skills taught (mainly physical skills) (section 5.7) and the fact that the population indicated that skills were taught when the child attained motion and speech could also be a contributory factor to the psychomotor enhancing activities. Holding child was the only activity significant with the age of the child but diminished with the age of the child.

The level of awareness on the value of play and teaching of skills on psychomotor development was very low. Play was considered useful to a child only at the age the child could not assist in any domestic chores. Provision of toys was not significant to the education level of the mother but as was pointed out during the FGD discussions, it was a way of distracting the child from parental attention not in any way related to child psychomotor development. Findings from this study showed that children who were taught some skills or encouraged to play recorded better psychomotor achievements compared to those who did not. A study by Gavey' (Steinberg, 1991) expresses that play allows the child to explore objects, social roles, language and feelings related to cognitive ability. Poor handling of toys by the study children is an indicator that the children were not exposed to adequate play materials.

Confinement of children indoors was found to be significant with psychomotor skills. Grossmotor skill (ability to jump) was not much affected by confinement indicating perhaps prior training (holding and carrying child) could have stimulated this achievement. But the other psychomotor activities were notably affected by confinement. This agrees with Steinberg, (1991) on the confined children (section 2.10.1), that normal growth requires both physical and social stimulation.

This study did not delve much on the diet aspect and psychomotor development but the prevalence of malnutrition and the low levels of education on the study area may have a relationship. It was however notable that stunted children's achievement on the selected psychomotor skills was relatively lower than for either underweight or wasted children. Although it was not part of this research, it was noted during the observation part of the research that many of the study children were fed on low quality diet (mainly starchy food). A longitudinal study done in Kenya and Mexico in the 80's (NCRSP), found positive and statistically significant associations between children's usual intake of animal source foods and their physical growth, cognitive function and school performance (Sigman et. al; 1989b; Wachs et. al; 1995). These findings showed that diet quality as apposed to the quantity of food energy and protein consumed, was a significant predictor of children's cognitive and motor development

Research has shown that a part of a person's potential intelligence is developed by the age of four and that early childhood intervention can have a lasting effect on intellectual capacity, personality and social behaviors. Early childcare (ECC) Programme should be a preparation for primary school, therefore should focus more on the very young, the 0-3 year old who is in particular physical danger from disease, and at risk of limited intellectual and emotional development due to lack of attention and cognitive stimulation. Hence reach out to all caregivers (Yambi, (1999), (Unicef regional Nutrition advisor).

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

The study aimed at identifying care activities associated with psychomotor development and how they are related to caregivers' characteristics and the characteristics of the child. From the results, the value of psychomotor activities to the development of the child is unknown by virtue of the fact that none of the psychomotor activities was reported as a childcare activity. However some psychomotor activities were observed and timed.

Findings from childcare activities lead to the conclusion that;

- ◆ The fact that only five activities are regarded as childcare activities implies the population is not clear on what childcare is and what value it has on the development of the child. Indication that the childcare activities are not significantly related to the caregiver's characteristics further confirms that the activities may not necessarily be done with a clear-cut purpose. Feeding and breastfeeding child are the most popular childcare activities as is indicated by the significance with the age of the child in both reported and observed activities.

Findings on time taken to perform childcare activities led to the conclusion that;

- ◆ Cooking for child and feeding child (on both solid and liquid food) are the activities that took the longest time contrary to what had been reported that washing child's clothes takes the longest time. It is evident from the results that nutritional status of the child is more valued in this community than the psychomotor status of the child.
- ◆ The caregivers' awareness on how to utilise their time on the child is low. The fact that the child was left on his/her own to play alone for long durations of time, shows the caregiver does not know the value of psychomotor enhancement care since she could have utilised some of her long resting time to play with, or teach some skills to the child.

On psychomotor activities, it is concluded that;

- ◆ Though not reported, psychomotor activities are there in the community but they are not given due consideration since their value is not known. Holding and carrying child have enhanced motor performance but lack of cognitive or more challenging skills are contributing to the low achievements in the fine motor and cognitive skills.

- ◆ Psychomotor achievements is significant with the age of the child albeit positively and negatively. Majority of the children are born normal as indicated by the normal responses in the sensorimotor stage of development. But as the child grows and lacks appropriate stimulation achievements diminish.
- ◆ Psychomotor performance is affected more by stunting especially in the fine motor and cognitive skills.
- ◆ The more the frequency of play and teaching of skills, the more skilled the child is socially, psychologically and physically.
- ◆ Confinement of children indoors is detrimental to the psychomotor development of the study children.

On the alternative caregivers the conclusion is:

- ◆ House girls who are young adults proved to contribute more significantly to the nutritional status of the study children.

On nutrition situation it is concluded that;

- ◆ The input by CBNP to fight malnutrition at the household/ community level has contributed to the lower levels of malnutrition of the study children.
- ◆ Young mothers with lower education levels are contributing more to stunting and wasting of infants and the young children.
- ◆ The community is gender biased with preference of boys to girls,

RECOMMENDATIONS

A renewed collective effort by the government (FLTP), CBNP and the community at large is crucial to revitalise their strategies of mobilization in order to disseminate information on the value of care practices. It is therefore recommended that:

1. CBNP/ FLTP broaden their care package to include psychomotor stimulating activities and to emphasize its value to the care of the child and to the entire society.
2. CBNP/FLTP center at Wang'uru to branch out to the villages instead of operating from one point. This will ensure effectiveness and encourage mothers to use the services offered.

A general recommendation to improve on the general condition of mothers and raise the standards of living would be;

- ◆ To emphasize and encourage completion on formal education especially to the girl child. This would enable her.
 - To get knowledge on child value and care, appropriate foods, appropriate feeding practices.
 - Avoid early births, affordability of necessary services, ability to hire or employ appropriate caregivers and to be able to take care of herself and her family.

REFERENCES

- ACC/SCN (1999):** Stunting and Mental Development (Extract)
- Allen and Gillespie, (2001).** What works? A review of the efficacy and effectiveness of nutrition Intervention. PP 2-4.
- Allen 1995; Grantham, McGregor, 1993; Hozoff, 1998; pollit Gorman, Engle, Maturella, Rivera, 1993; Sigman, Neumann, Buribo, 1989; S. Grantham-Mcgregor 1990; Wachs, 1995.** In Whaley et, al; (1998). The Impact of Dietary Intervention on the Cognitive Development of Kenya School children-Embu (extract). Pp 3,5,6,7,17-21
- Alley 1995; McGregor, 1993; Mcgregor,; 1990; Wachs, 1995.** In Engle, 1992. Care and Nutrition.
- ANP (2000).** Food and nutrition security, survey in maragua and Gikingo locations of tharaka district, Eastern province, Kenya. Applied nutrition programme department of food technology and nutrition, university of Nairobi PP 17-45.
- Basse and Therease M, (1984).** In Women, Food and Nutrition in Africa.
- Beckwith (1977), Clarke-Stewart, 1973; Engle and keane, 1975; Nebon, 1973.** In Steinberg and Belskey (1991). Infancy, childhood and adolescence pp. 168-169.
- Bell 1971; Brandley and Caldwell, 1976; 1984. (Clarke Stewart, 1973; Engle and Keane, 1975.** In Steinberg and Belskey (1991). Infancy childhood and adolescence. pp.168-196.
- Brown et. al 1990., Roseberg et. al., 1977; Rohenum and waled, 1983.** In Engle 1992. Care and Nutrition.
- Brown et. al., 1990; Rosenberg et al., 1977.** Rahaman and Wahed (1983). In Engle 1992. Care and Nutrition.
- Brozek and Schurch** In Engle P.L 1992. Care and Nutrition (UNICEF).
- Calverton, MD. (1996).** African Nutrition. Nutrition and Health Status of young children
- Cameron and Hofvander (1983).** Manual on Feeding infants and young children. Oxford University Press. Care for Nutrition. UNICEF Nutrition Section New York pp 1-34.
- Carr M. and Sandhu, (1987).** Women, technology and rural Productivity. An analysis of the impact of time and energy saving technology and women. UNIFEM occasional paper no. 6. Unifem, NY.

- Cavem 1980; Clarke-Stewart, 1973; Handy-Brown et al, 1981; yellow et al, 1973, In Steinberg and Belsky,1991.**
- Caverton, MD. (1996).** Africa-Nutrition. Nutrition and Health Status of young children and their motherS in Kenya. Findings from the 1993 Kenya Demographic and Health survey. pp 5-7
- CBNP'S (June 2002).** Terms of Reference and Operational Research on ECD.
- CRSP, (1987).** Food Intake and Human Function, Kenyan project, final report. University of Nairobi, Kenya pp 295-305, 471-493.
- Engle et al; (1997).** Care and Nutrition. International Food policy Research Institute pp 5-8, 14-15.
- Engle, Menon, and Haddad(1997).** Care and Nutrition.
- Engle P.L. (1992).** Care and Nutrition (ICMN). UNICEF New York pp 5-8 13-47
- Esrey et al., Haggerty et al., 1994.** In Engle 1992. Care and Nutrition.
- FAO (1992).** The fifth World Food Survey. Food and Agriculture Organisation of the United Nations, Rome, Italy.
- FAO/WHO (1992)** International Conference on Nutrition Major Issues for Nutrition strategies. Theme paper No. FAO and WHO Italy.
- Fisher et. al., (1991).** Handbook for Family planning operations Research and Design. Operations Research population Cornell. USA pp 43-66. Food and Nutrition Bulletin Vol. 16 No. 1 pp 34-38. Food/ Nutrition Bulletin Vol. 164 pp 349-353. Foods to Prevent Protein Energy Malnutrititonal; an Asian Review.
- GOK (1998).** Kenya Demographic Health Survey pp,24, 115, 119, 124.
- GOK (2003).** Kenya Demographic Health Survey pp15-16,25-26, 35, 59, 156-163.
- GOK (2003).** Kenya Demographic Health Survey. Preliminary Report pp21, 60
- GOK/ UNICEF (1989-1993).** Five year plan for child survival, Women and development pp.6
- GOK/UNICEF Kenya, (1992).** Children and women in Kenyan situation Analysis.
- GOK-Danida, (2000).** Programme Document- C.B.N.P – Kenya Annex 6 pp 6-1
- Govitz, 1975; Yallow, 1961.** In Steinberg, (1991). Infancy, childhood and adolence.
- Grant (1985).** The state of the World's Children UNICEF
- Grant, J.P. (1985).** The State of the World's Children UNICEF.
- Grantham- McGregor et al., (1991).** Nutritional supplementation, psychosocial stimulation and mental development of stunted children. The Jamaican study. Lancet 1991.
- Haggerty et al., (1994); Clemens and Stanton, (1987).** In Engle 1992. Care and Nutrition

- Harris and Liebert, (1992).** *Infant and Child Development from Birth to Adolescence* pp 3, 9, 15
- Harrison et. al., (1988).** Does prolonged breastfeeding adversely affect a child's nutritional status? *Lancet*, Vol.2 pp 416-8 in Kenya. Institute for Human Nutrition; West Germany. International Centre for Research on Women. Washington D.C. pp 1-5, 9-10, 23-25. International Food Policy Research Institute pp 5-8, 14-15.
- Ireni D. (1986).** Mwea Tebere irrigation scheme; "Lessons and experience" an issue paper prepared for Agricultural Sector planning and management course-organised by Economic development Institute (EDI) and Institute for Development studies (IDS) University of Nairobi. 10th July-8th Aug 1986.
- Jooste P.L, Langen hoven, J.A. kriek, E. Kunneke, M. Nyaphusi, B. Sharp.** Nutritional status of rural children in the Lesotho highlands. *East African Medical Journal*. 1997; 74(ii); 680-688.
- Juntrin and Visuit, (1995).** In Abate (1998). Childcare practices in households with malnourished children and those with well nourished children in a slum area of Addis Ababa, Ethiopia. MSc. Thesis, University of Nairobi.
- Kahn et al., (1989).** *Statistical methods in Epidemiology*. Oxford University press New York
- Kamau (1994).** Childcare Practices and Nutritional Status of Children 0-2 years in Makongeni Thika District-Kenya. MSc. Thesis, Unniversity of Nairobi.
- Keissland and Burghat, 1988; Blanchet, 1984; McDonald, 1987; mcGilvey, 1982.** In Engle. (1992). *Care and Nutrition*.
- Kenya Republic of (1988).** Rural Household Energy profile. Kisii District (Unpublished).
- Kilbride, (1977); Super, (1981).** In Steinberg (1991). *Infancy, childhood and Adolescence*. Development in context pp
- Korte R. (1967).** Report on Nutrition Survey Conducted in Mwea Irrigation Scheme
- Lamountage ,Engle and Zeitlin, (1998).** Maternal Employment, Childcare and Nutritional Status of 12-18 months Old Children in Mnagua, Nicaragua. *Journal of Social and Medicine* 46 (3) pp 403-414.
- Leslie, (1988)-** Women's time, a factor in the use of Child Survival Technologies.
- Levin (1981).** In Kamau, 1994. Childcare practises and nutritional status in children 0-2 years old in Makongeni, Thika.
- Lewis and Goldberg, (1969); Tulki and Govitz, (1975); Yallow, 1961.** In Steinberg and Belsky (1991). *Infancy, chilhood and adolescence*.

- Martinez, H. And Tomkin's A.M (1995)-** Nutritional Management of Diarrhoea; Food and Nutrition Bulletin. Vol. 16 no. 4 pp 349-353
- Martorell et al., (1988).** Malnutrition, Work Output and Energy needs in KJ Collins and DF Roberts (eds). Capacity for work in Tropics. Cambridge, England Cambridge University press..
- McCall, Eichom and Hogarry (1977).** In Steinberg and Belsky, (1991). Infancy, childhood and Adolescence. Development in context pp160.
- Mcguire and Popkin, (1990).** In Engle (1997). Care initiative
- Meme, M.R. (1996).** Nutrient intake and nutritional status of primary school children in a school with and without a feeding programme in Nyambene District, Kenya. MSc Thesis, University of Nairobi.
- Mitzener, Scrimshaw and Morgan, (1984).** Improving the Nutrition Status of children during the Weaning Period. A Manual for Policy Makers. Pp 34,56, 79,151,181
- Moor, (1990).** In Engle 1997. The care initiative.
- Muir and Field, (1979).** In Judith and Robert (1992). Infant and child development from Birth through middle childhood pp.474
- Mwadime, K. (1992).** Expenditure, Food Consumption Patterns and Nutritional Status of Tenants in Mwea Tebere Irrigation Scheme-Kenya. MSc. Thesis, University of Nairobi pp 83-84
- Mwea (1972).** An Irrigation Rice settlement in Kenya; Oriental and African Studies-London.
- Myers (1992).** The Twelve who Survive. Routledge, London Chapter 3, and 12.
- National Irrigation Board (1976).** Mwea Irrigation Settlement Scheme Annual Report.
- NCPD (1989).** Kenya Demographic and Health Survey 1989. Institute for Resource Development/Macro systems, Inc. Colombia.
- Olle Nordberg et al; UPPSALA (1975):** Action for Children Towards and
- Ominde, S.H (1987).** The Luo girl from infancy to marriage. Kenya Literature Bureau, Nairobi PP 66.
- Opiyo, (1993).** Childcare Practices and Nutritional Status of 0-2 year old Children in Lower Nyakach, Kisumu District. MSc. Thesis, University of Nairobi pp 86, 89
- Paulisso et al., (1989).** In Opiyo, (1983). Childcare practices and Nutritional status of 0-2 year old children in lower Nyakach , kisumu District.
- Piaget (1968).** In steinberg and Belskey, (1991). Infancy, childhood and adolescence. Development in context pp.253.

- Popkin and Limybanez, (1987).** In whaley E. 1998. The Impact of Dietary Intervention on Kenyan School Children
- Quinin, V.J (1992).** A users manual for conducting child nutritioun surtveys in developing countries. Cornell University Food and Nutrtrion, Policy programme New.
- R.K.N. Mwadime, A.M. Omwega, N. Kielman, R. Korte, (1995):** Predictors of Nutritional Status Among Participants in a Rice Irrigation Scheme pp 263-264, 270-271
- Rabiee and Geissler, (1992).** In Engle 1992. Care and Nutrition
- Rahmanijer et. al., (1992).** In Engle, (1997). In Care initiative (1997).
- Ravindran (1986).** In Engle, (1997). In care Initiative (1997).
- Richardson (1995).** In Engle, (1997). Care Initiative pp.30
- Rindfuss, R. and Parnell, M. (1989).** The Varying Connection between Marital Status and Childbearing in the United States. Population and development Review is No,3 (September 1989) pp447-451.
- ROK (1997-2001).** Kirinyaga District Development Plan
- ROK (1997-2001).** Kirinyaga District Development Plan.
- ROK (1998).** Kenya Demographic and Health Survey 1998 pp 12, 20, 120-121
- Schiemberg L. (1991).** Human Development pp 194-199, 208-209, 280-281, 289-295
- Scrimshaw et, al., (1968).** The success of mothers in maintaining the health of their children. Experiences from a Guatemalan Coastal population.
- Shar et. al., (1979).** In Engle (1997) Care Initiative.
- sigman et, al., (1989b).** in whaley E. (1998). The impact of Dietany intervention on the cognitive development on Kenyan school children.
- Smith and Haddad, (2000).** Explaining Child Malnutrition In Developing Countries. A Cross country Analysis. IFPRI. Washington Research Report 3 (abstract)
- Steinberg L. and Belsky, (1991).** (Infancy, childhood and Adolescence. Development in Context) pp 136, 140-145 156-159, 173-179, 247
- Suitor and Crowley (1984).** Nutrition Principles and application in Health promotion. 2nd Edition, Philadelphia..
- Tuntisirin, K. And Yomborisot, V. (1995).** Appropriate weaning Practices and foods to prevent protein-energy malnutrition: An Asian Review. Food and Nutrition Bulletin. Vol.16 no.1 pp34-38
- UN (1986).** How o weigh and measure children. Assessing the nutritional status of young children in household surveys.

- UNESCO- UNICEF, (Digest 18).** Early Childhood Development. Two papers on UNICEF. Policy and Programming Co-operative Programme Paris
- UNICEF (1992).** In Engle 1997. Care and Nutrition
- UNICEF (1997).** In Engle (1997). The Care Initiative. Assessment, Analysis and Action to improve care for Nutrition.
- UNICEF (1989).** Situation Analysis of Children and Women in Kenya Nairobi pp 71-76.
- UNICEF, (1999):** Developing Alternative Complementary Approaches to early Childhood Care for Survival, Growth and Development in Kenya pp 17-19.
- UNICEF/GOK, (1989).** Five year plan for child survival, women and development.
- UNICEF-KENYA (1986).** Family Health Growth and Development pp 2-3
- Ver Estrik (1989).** In Engle 1992. Care and Nutrition
- Villar and Riviera, (1998).** In Engle 1997. The Care Initiative. Assessment. Analysis and Action to improve care for Nutrition.
- Waterloo, (1973).** Notes on the assessment and classifications of protein Energy malnutrition in children. Lancet, ii 87-89.
- Whaley E. et. Al., (1998):** The Impact of Dietary Intervention the Cognitive Development of Kenyan School Children pp 2-7, 17-21
- WHO, (1979).** Health of the Worlds Children. Division of Family Health. WHO Chronicle.
- WHO, (1981).** Contemporary Patterns of Breastfeeding. Pp 31, 34, 43
- WHO, (1983).** Measuring change in nutritional status. Geneva
- Winkvist, (1995).** In Engle 1997. Care initiative pp 29
- World Bank (1993).** In Engle P.L 1992. Care and Nutrition. UNICEF.
- World Bank(1993).** World Development Report “ Investing in health, World Development Indicators”. Oxford University Press.
- Yambi (Unicef Regional Nutrition Advisor), (1999) -Extract**
- Zeitlin et, al., (1989).** Active Maternal feeding and Nutritional status of 8-20 months old Mexican children.
- Zelazo, Zelazo and Kolb, (1972).** In Steinberg, (1991). Infancy, childhood and Adolescence. Development in context. Pp.140-141.

APPENDICES

APPENDIX 1

QUESTIONNAIRE

Name of the interviewer _____

Date interview _____

Village _____

Household number _____

Head of household _____

Name of mother _____

PART A (DEMOGRAPHIC DATA)

Ask the mother the following questions and fill in appropriately

1. Age of the mother (in years) as of the last birthday. (May check with her ID).

2. Marital statuses

- 1). Single (never married)
- 2). Married (monogamous)
- 3). Married (polygamous)
- 4). Divorced /separated

3). Highest level of education attained

- 1) None
- 2) Primary
- 3) Secondary
- 4) Post secondary

4). Occupation of the mother

- 1). Formal employment
- 2). Self employment (specify)
- 3). Subsistence farmer
- 4). Casual labourer
- 5). Others (specify) _____

5). Religion of the mother

- 1) Christian
- 2) Muslim
- 3) None
- 4) Others (specify)

6). Number of people in the household _____

7). Number of children less than five years old in the household _____

8). Name of the index child _____
(index child = youngest child in the household)

9). Age of index child (date of birth)

Date of birth	Days	Months	Years

10). Is the child health card available (see it)

1.) Yes

2.) No

11). Sex of the index child

1) Female

2) Male

12). 12 Birth order of the index child

13). 13 Birth spacing with the next child

N/B: 1st Birth = code 88

14). How long have you leaved in that place? _____

HOUSING, WATER, SANITATION AND HYGENE

15). Observe house and record material for

1) Roof _____

2) Walls _____

3) Floor _____

16). Observe compound and record

1) Human fecal matter in the compound or house

2) Animal fecal matter in the house or compound

3) No fecal matter observed

17). What is your source of water?

1) Tap in the village

2) Tap in the home

3) River

4) Borehole

5) Irrigation water/ canals

6) Spring

2) No

29). Do children use the latrines? (If not inquire what they do)

1) Yes

2) No

FEEDING PRACTICES.

30). Are you breastfeeding your child now?

1) Yes

2) No

N/B: If no go to question 31 and 32

31). How long did you breastfeed him?

1) Less than 12 months

2) 12-18 months

3) 19-24 months

4) 25-36 months

32). Why did you stop breastfeeding?

1) To resume work

2) Next pregnancy

3) Child sick

4) Mother sick

5) To wean (introduce other foods)

33). At what age did you introduce other foods to the baby?

Months

Weeks

Days

Semi-solid foods and fluids	Age in months	Mode of feeding
1st semi-solid foods		
1st fluids		
Others		

35 Why did you introduce those foods at that time?

1) The baby was crying

2) Mother did not have enough milk

3) Mother sick

4) Mother at work

5) Others (specify)

36 Apart from breastfeeding, how many times does the index child feed in a day?

37 How is the child fed?

1) Own plate -hands

2) Own plate -spoon

3) Fed by caregiver

4) Share plate with caregiver

HEALTH CARE PRACTICES

38 Do you utilize family planning services?

- 1) Yes
- 2) No

39 Which family planning methods do you use _____

40 Have you ever had any problems with any of the family planning methods you have used?

- 1) Yes
- 2) No

41 Where did you deliver your index child (verify from the card)

- 1) Health facilities
- 2) Home with a trained attendant
- 3) Home alone
- 4) Home with untrained attendant

42 Are you taking your child for growth monitoring?(verify from the month shown on the card)

- 1) Yes
- 2) No

43 if no say why not _____

44 did you discuss the weight of the child with the health worker?

- 1) Yes
- 2) No
- 3) Card not available

45 Is the child immunized for age? (Verify from the child card)

- 1) Yes
- 2) No
- 3) Card not available

MORBIDITY/ HEALTHY STATUS

46 In the last two weeks, has the child had any of the ailments below and what did you do?

AILMENTS	REMEDY
1) Diarrhea	_____
2) Fever	_____
3) Cough	_____
4) None	_____
5) Others (specify)	_____

47 Are there any particular foods you do not give to the child when she /he is sick?
(Whatever sickness)

- 1) Yes
- 2) No

48 If yes, what are these foods and in which disease?

Food available during sickness	Advised by	Disease or condition

MATERNAL AND CHILDCARE ACTIVITIES

49 What activities did you start with, from the time you woke up in the morning to the time you went to sleep the evening yesterday? (N/B: Try to probe/ guide)

Time	Activity
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	

50 Among the activities you have mentioned, (may remind her) which ones do you consider childcare activities?

- 1)
- 2)
- 3)
- 4)
- 5)
- 6)

51 Is there any other childcare activity that you have not mentioned?

- 1) Yes
- 2) No

52 If yes list the activities not mentioned above

- 1)
- 2)
- 3)

53 Which of the listed childcare activities are most important to you?

- 1)
- 2)
- 3)
- 4)
- 5)
- 6)

54 Of the above listed childcare activities, which ones take more time to carry out?

- 1)
- 2)
- 3)
- 4)

55 Who normally takes care of the child apart from the mother?

- 1) Nobody
- 2) Brother/ sister
- 3) Grand parents
- 4) House girl
- 5) Others specify _____

56 How old is the person who take care of the child most of the time (age in years)

57 what is the caretaker's level of education?

- 1) No education
- 2) Class 1-4
- 3) Class 5-8
- 4) Secondary and above

USE OF TIME-SAVING METHOD IN CHILDCARE

58 Childcare activities may take too much of the mothers time. Do you use anytime-saving methods in connection with the following: -

<u>Activity</u>	<u>Time Saving Method</u>
1) Looking for food	_____
2) Fetching firewood	_____
3) Fetching water	_____
4) Food preparation	_____
5) Cooking	_____
6) Feeding the child	_____
7) Other childcare activities	_____

PHYSICAL DESCRIPTION OF THE CHILD AND HIS ENVIROMENT

59 (Tick whether clean or dirty)

	<u>Clean</u>	<u>Dirty</u>
Clothes	_____	_____
Nose	_____	_____
Face	_____	_____
Body	_____	_____
Playing Environment	_____	_____

PSYCHOMOTOR DEVELOPMENT

60 Please let me know when the child achieved these steps of growth and development.

Milestones	Age of achievements (months)
Skills	
-Balancing his/her head	
-Active grasping with hand	
-Sitting without support	
-Crawling	
-Able to speak 4-5 words	
- Able to walk a few steps	

61 How often these activities performed and who does them?

CHILD CARE ACTIVITIES	HOW OFTEN	CAREGIVERS		
		1	2	Others
Play with child				
Fondle or caress the child				
Teach skills to the child e.g. to walk, sit, talk etc.				

Codes of care givers: - 1) Mother 2) Father 3) Sister 4) Brother 5) Cousin 6) Aunt 7) Maid 8)Grandmother 9) Any caregiver in the household 10) Neighbour 11) others (specify).....

62. Do you consider play an important event in your children?

- 1.yes
- 2.No

63. Do you buy or improvise playthings for your child? (Have to see them or otherwise no)

- 1.Yes
- 2. No

64. If yes, which play things do you buy or improvise?

- 1.....
- 2.....
- 3.....

65. When do you consider play to be most important during childhood (between birth and 18 years)?

- 1. 0-1
- 2. 1-2
- 3. 2-3
- 4. 3-4
- 5. 4-5
- 6. 5-12
- 7. Above 12

66. Do you restrict your child indoors?

- 1. Yes
- 2. No

67. Give reasons why you do this

- 1.....
- 2.....
- 3.....

68. Do you take time to teach any skills to the child?

- 1. Yes
- 2. No

69. If no give reasons

- 1.....
- 2.....
- 3.....

70. Give examples of the skills you teach your child.

- 1.....
- 2.....
- 3.....

71. Can your child differentiate between the neck and the chest? (Ask the child to show you)

- 1. Yes
- 2. No
- 3. Underage

72. Ask the child if she has ever seen a car.

- 1. Yes
- 2. No

73. If yes, ask him how a car looks like

.....

74. Observe the child and indicate

- 1. Active
- 2. Reserved
- 3. friendly
- 4. Unfriendly
- 5. Sickly

75. Can your three year old be able to:

- 1. Unbutton buttons
- 2. Jump a short distance into the air
- 3. Put on shoes by himself
- 4. None of the above
- 5. Not applicable

76. Give the child any of the following toys:- a shaker, a car, or a ball depending on their age and see the reaction of the child

77. Observe the mother as she feeds, holds or changes the child. Does she communicate to the child either by language or gestures?

1. Yes

2. No

78. Have you noted any differences between the children in the rural areas and children in towns?

1. Yes

2. No

79. If yes, indicate any three differences

1.....

2.....

3.....

80. Could you suggest three ways in which we could improve on our children?

1.....

2.....

3.....

81. ANTHROPOMETRY

Name of child.....(index child)

Sex of child 1. female

2. Male

Age of child in months.....

Age verified 1. Yes

2. No

	1 st	2 nd	Average
Weight Tolerance, +/- 0.1kg			
Height Tolerance, +/- 0.5cm			

Anthropometric measurements of the child: Weight, Length/height

Household No.....Date of birth...../...../.....

Date of weighing...../...../.....

Location	Village No	Name of Child	Sex	Age in Months	Weight (kg)			Height (cm)		
					1 st	2 nd	Av.	1 st	2 nd	Av.

Loc. 1. Tebere

2. Nyangati

Villages' 1. Kirogo

2. Kiriko

3. Nyamindi

4. Kamuchege/Bahati

5. Mahigaini

6. Gathigiriri

7. Murubara.

8. Mathangauta

9. Matandara

10. Mwathaini.

APPENDIX 2

PHASE TWO OF THE STUDY- OBSERVATION SESSION

INSTRUCTIONS.

1. Each observation should take exactly one and half-hours.
2. Observe and read all maternal and childcare activities.
3. Time the childcare activity from the beginning to the end. Record the time taken in minutes and fill in the time record Budget sheet.
4. If more than one activity is going on at the same time use different stop watches.
5. Mark with a star (*) all the childcare activities you find already going on when you arrive in the home and those you leave uncompleted by the time you leave the home at the end of one and half hour period.
6. Column for total time per day is filled using the following formula

$$\text{Total time/ day} = A + B^*/ 2$$
 Where A= Total time for activity timed from the beginning to end
 B*= Total time for incomplete activities as marked with a star(*) in 5 above.

Date..... Name of field worker.....

Village House No.

Name of mother

Name of index child

Age of index child Sex of index

(Ask the mother to recall all the activities she had done from the time she got out of bed before you arrived in the household)

Activities done before the field worker arrived.

1.
2.
3.
4.
5.

Observe and record all the activities of the mother.

1.
2.
3.
4.
5.

Observe and time (Minutes) the childcare activities and fill in appropriately in the time-budget sheet below.

CARETAKER CODES

- 01- Mother
- 02- Father
- 03- Sister
- 04- Brother
- 05- Cousin
- 06- Aunt
- 07- Maid
- 08- Grandmother

EDUCATION CODES

- 1- Formal
- 2- Non-formal
- 3- Adult education
- 4- Others.

09- Neighbour

10- Others

TIME RECORD BUDGET SHEET FOR CHILDCARE ACTIVITIES

	CHILDCARE ACTIVITIES	CAREGIVERS CHARACTERISTICS			TIME (MINUTES)					TOTAL TIME/ DAY	BRIEF DESCRIPTION	
		Cod e	Age	Educ	7.00am to 6.00pm							
1	Food preparation	1. 2.										
2	Feed child on liquid food	1. 2										
3	Care of/ washing	1. 2.										
4	Washing child	1. 2										
5	Breastfeeding	1. 2										
6	Changing child when wet	1. 2										
7	Holding child	1. 2.										
8	Feeding child on solid food	1. 2.										
9	Playing with child	1. 2.										
10	Teaching child to walk, sit, talk etc.	1. 2.										
11	Child sleep	1. 2.										
12	Playing alone	1. 2.										
13	Playing with others	1. 2.										
14	Discouraged from eating dirt	1. 2.										
15	Caretaker resting	1. 2.										

APPENDIX 3

PHASE ONE: PART TWO - FOCUS GROUP DISCUSSION

Objective of the Discussion

The main objective of the focus group discussion is to confirm the local understanding of childcare behaviour, the techniques used to save time in childcare activities and the perception of any psychomotor activities to child development by mothers of 0-36 months old children.

GUIDELINE QUESTIONS

DATE OF FGD..... NOTETAKERS NAME.....
DISTRICT..... LOCATION.....
VILLAGE CENTRE.....
NAME OF MODERATOR.....
NAME OF RECORDER.....

Guideline questions

1. There are many household activities that a mother or a woman in the home has to perform in the daily running of her home. Could you please identify and describe briefly those activities you regard as childcare activities
2. Of these activities you have mentioned, which ones do you consider as more important childcare activities and which of these activities take you long time to finish?
3. For how long are babies exclusively breastfed and why?
4. What are the first foods and fluids fed to babies?
5. What foods are not fed to children at any time and what are the reasons?
6. What body-building foods do we give to our children and at what age?
7. Are there any foods considered good for children say for example during illness and why?
8. What are some of the common child illness and how are they managed such as diarrhea?
9. Do you value family planning services? Discuss.
10. If you get any problem from any of the family planning methods, do you seek medical advice?
11. For how long do you take your child for growth monitoring?

12. We have noted that many of you do not boil their drinking water. Does this mean you are immune from waterborne diseases
13. We as mothers agree that we are overburdened by home-running activities, such that we may not so much to our children. Are there any shortcuts you take to lessen the time taken in some activities so that you could try to cope up such as in:
 - Looking for food
 - Fetching firewood
 - Fetching water
 - Cooking
 - Feeding the child
14. Do you value child play? Do you involve yourself in child play? At what age do you think child play is important and why?
15. In what ways is play important for child development?
16. As a parent, how do you support child play in the community..... for example, do you go out of your way to purchase or improve play things for your child?
17. Sometimes if the child does not show good qualities such as academic excellence, the father brands him " as foolish as the mother". Do you think that as the mother you could have contributed to this ' foolishness' (timidness, abusive language, poor social and academic performance e.t.c?)
18. Do you think that children in towns are better than those in the rural areas? Support your answer.
19. Last but not least- has there been any agency/ body or institution involved in ECD activities in this area? If yes, what was their focus especially on 0-3 year old children?

NOTES FOR THE RECORDER

Date..... Time of: - Start.....
 End
 Duration

Notetakers name

Village

Meeting place

No. of participants (Mothers/ fathers of 0-36 month old children

NAMES AND CHARACTERISTICS OF PARTICIPANTS

	Name of mother/ father	Education level	Age of youngest child in months	No. Of children < 5 years
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

APPENDIX 4

Gross and fine motor skills achievement by age.

2 Years	2 ½ years	3years
GROSS MOTOR SKILLS BY AGE		
Walks up and down stairs alone one step per tread	Can walk on tip toe	Runs well but will occasionally stumble or fall
Can walk backward	Balances for 1 second on the foot	Can use hands and feet simultaneously i.e can clap hands while stamping
Can throw a ball overhand	Jumps with both feet in place	Can throw a ball without losing balance
Kicks large ball forward on request	Helps dress or undress	Jumps a short distance into the air
		Alternates forward foot going upstairs
		Rides tricycle with no difficulty
		He does most of dressing puts on own shoes
FINE MOTOR SKILLS BY AGE		
Can deal with some mechanical devices such as type toys, door knobs	Copies a crude circle	May be able to unbutton some front buttons, side buttons with difficulty
	Can imitate vertical and horizontal strokes on paper	-Copies a circle reasonably well.
		-May be able to use scissors
		-Complete simple puzzles

Source: Compiled from L. Skinner (1979) motor development of the preschool child.

APPENDIX 5

Piaget's sensorimotor stages of child development.

Stage	General	Object Concept
1. Reflex (0-1mth)	Reflex activity	No differentiation of self from other objects.
2. First differentiation (1-4 mths)	Hard mouth coordination: differentiation via sucking, grasping	No special behaviour re: vanished objects; no differentiation of movement of self and external objects
3. Reproduction (4-8mths)	Eye – hand coordination reproduction of interesting event	Anticipates positions of moving objects
4. Coordination of schemata (8-12 mths)	Coordination of schemata: application of known means to new problems	Object permanence: searches for vanished objects;; reverses bottle to get nipple.
5. Experimentation (12-18mths)	Discovery of new means through experimentation	Considers sequential displacements while searching for vanished objects.
6. Representation (18-24mths)	Representation: invention of new means via internal combination	Images of absent objects representation of displacements.

Source: From Piagets Theory of cognitive development. Second edition, by J. Wadsworth. Copyright @ 1971 and 1979.

APPENDIX 6

Anthropometric Weight and Height Measurements

Weight Measurement

Weight was obtained using a salter spring scale measuring up to 25 kg with increments of 100g. The following steps were followed:

- 1 The scale was suspended at eye level with a rope from a low branch of a tree or a rafter on roof of the house.
- 2 The scale was adjusted to “zero” with a pair of empty weighing pants attached to it.
- 3 The child was then placed in the pair of weighting pants which were suspended by a hook on the weighing scale (see appendix 7)
- 4 Weight measurement was read twice to the nearest 0.1kg.

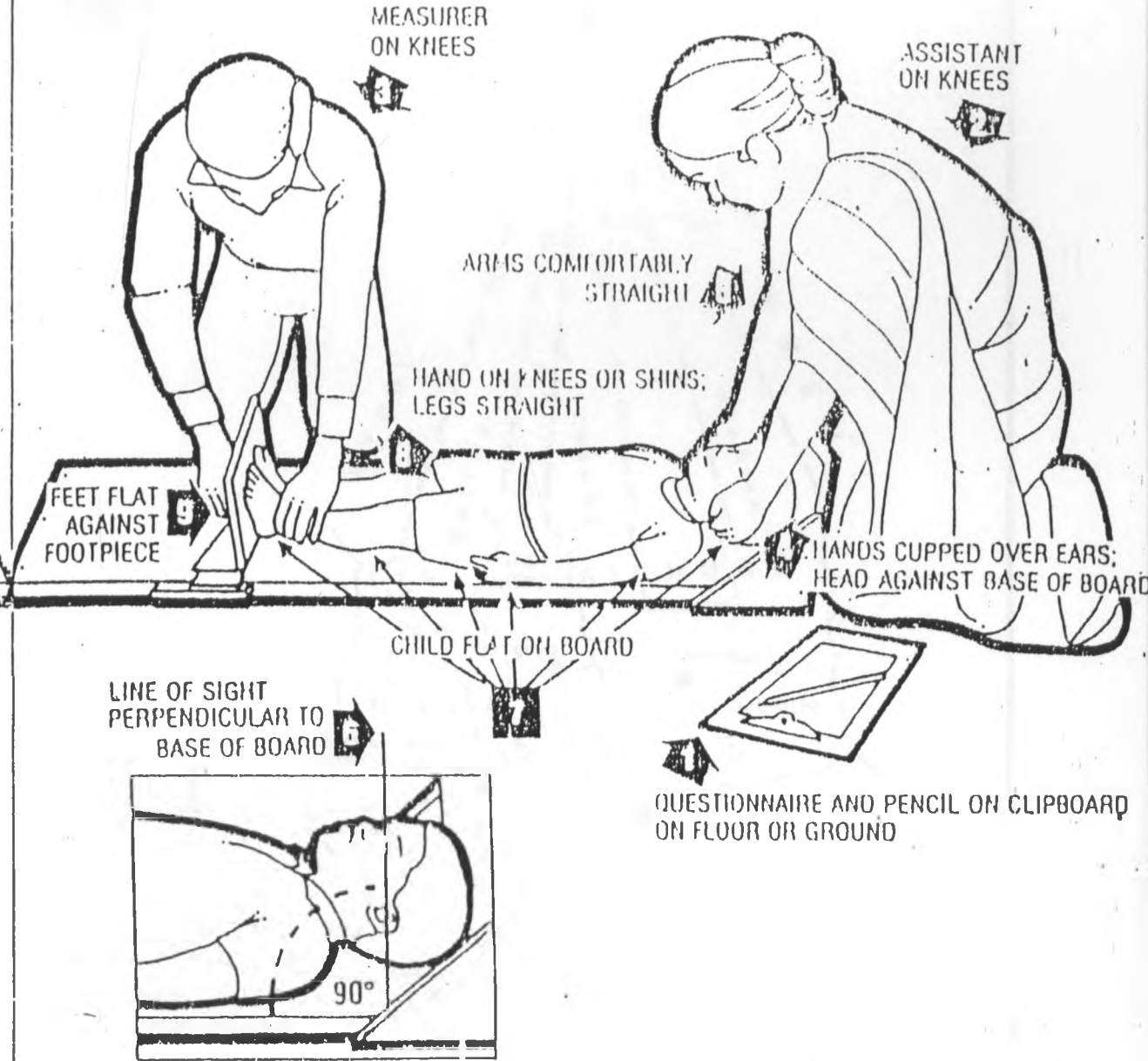
Height Measurement

The recumbent length (crown-heel length) of the child was taken with a wooden length-board as follows:

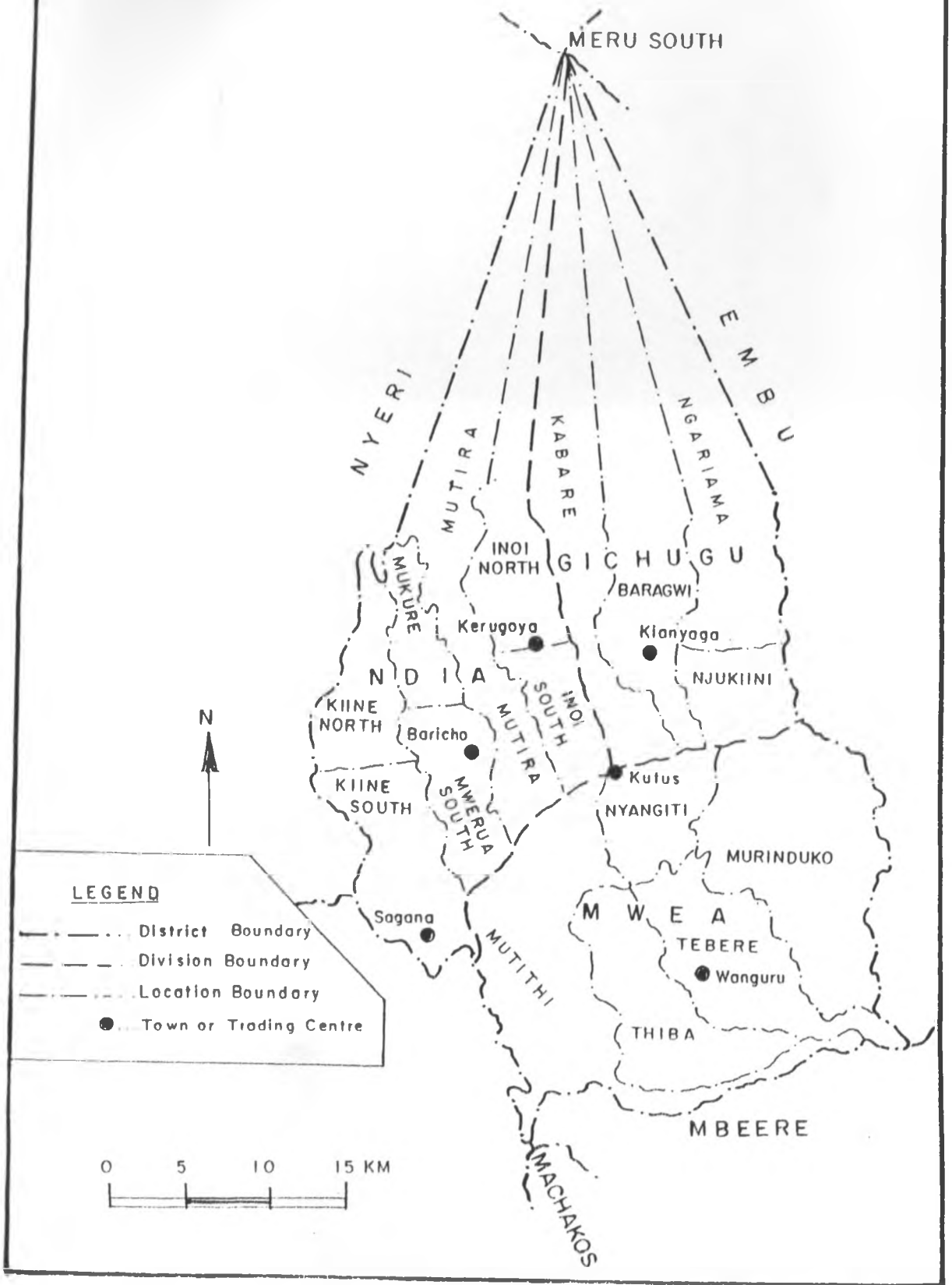
- 1 The child was laid on the board which was on a flat surface with the head positioned firmly against the fixed headboard, and the head looking straight up.
- 2 The knees were extended by firm pressure applied by an assistant, and the feet flexed at right angles to the lower legs. (see appendix 8)
- 3 The upright sliding footpiece was then moved to obtain firm contact with the heels and the length read twice to the nearest 0.1 cm (UN, 1986; Quinn, 1992).

Child Weight





Administrative Boundaries of Kirinyaga District.



Source: Kirinyaga D.D. Plan, 2001-2003

CONDITIONS

1. You must report to the District Commissioner of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit.
2. Government Officers will not be interviewed without prior appointment.
3. No questionnaire will be used unless it has been approved.
4. Excavation, firing and collection of biological specimens are subject to further permission from the relevant Government Ministries (U.A.S).
5. You are required to submit at least four (4) bound copies of your final report.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice.



REPUBLIC OF KENYA

RESEARCH CLEARANCE
PERMIT

GER 7692-408-11796

(CONDITIONS—see back page)