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INTRAHOUSEHOLD RESOURCE ALLOCATION, DECISION MAKING, AND CHILD NUTRITIONAL STATUS
IN RURAL THIKA, KENYA

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Major professor

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INTRAHOUSEHOLD RESOURCE ALLOCATION, DECISION MAKING, AND CHILD NUTRITIONAL STATUS IN RURAL THIKA, KENYA

Ву

Lucy Wanja Ngige

A DISSERTATION

Submitted to
Michigan State University
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ABSTRACT

INTRAHOUSEHOLD RESOURCE ALLOCATION, DECISION MAKING, AND CHILD NUTRITIONAL STATUS IN RURAL THIKA, KENYA

By

Lucy Wanja Ngige

The relationship between intrahousehold resource allocation, decision making patterns, and child nutritional status was investigated in this cross-sectional descriptive study. The research was approached from a family resource management perspective and the ecology of human development theoretical framework. A random sample of 101 households in a sublocation in Thika Division of Central Kenya was surveyed using in-depth interviews with fathers and mothers, and anthropometric measurements of preschool children ages 3 to 6. Parents provided data on decision making patterns, time and task allocation, money allocation priorities, food allocation strategies, child care, child food consumption, and child health condition.

About a fifth (19.8%) of the children were considered severely malnourished, slightly more than a third (34.7%) were categorized as normal, and about a quarter (26.8%) were classified as moderately malnourished. In general this sample of children suffered from both chronic and acute malnutrition. Significant relationships ($p = \langle .05 \rangle$) were evident between child nutritional status and fathers'

occupations, perceptions of family financial adequacy, mothers' levels of education, mothers' occupations, mothers' time allocation, mothers' participation in decision making, mothers' decision making autonomy, male gender preference, child's contribution to household resources, child's health condition, availability of multiple cooking facilities, child food variety, and a need based food allocation strategy applied to children. There were no significant relationships between child nutritional status and fathers' levels of education, fathers' time allocation, fathers' participation in decision making, fathers' decision making autonomy, cooperative decision making structure, fathers' income and food allocation influence, family size, family developmental stage, child's gender and age. There were indications however that these predictors should continue to be investigated.

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DEDICATION

To my precious mother, Jedidah and in memory of my loving father, J. Githui.

To my precious husband, F. M. Ngige;
and
to all the underprivileged families and children
of the world

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CHAPTER 1

INTRODUCTION

Statement of the Problem

A prime requirement for the physical and mental well-being of both adults and children is an adequate food supply that enables a nutritionally balanced diet to be consumed. However not all families of the Kenyan population have been able to enjoy a nutritionally adequate diet. The problem of nutritional deficiency is closely associated with poverty, inefficient food production, resource allocation, food habits, and lack of adequate understanding of the nutritional values of different food items and how to utilize them effectively (Kenya, 1981).

A significant proportion of the Kenyan population, particularly preschool age children, is malnourished as a consequence of inequalities in the distribution of purchasing power, seasonal localized food shortages, and lack of nutritional education. Research findings indicate that an inadequate nutrient intake during infancy and early childhood severe enough to produce a marginal state of undernutrition can have a detrimental effect on the child's physical and mental development that will persist throughout

adult life (Engle & Irwin, 1979). Furthermore there is a possibility that nonnutritional variables are associated with the course of a child's mental development. Winick (1979) suggested that family characteristics do covary with nutritional status. This suggests the possibility that some family contexts may be more conducive to maximizing children's health and nutrition than others. This mode of thinking leads to the need for greater understanding regarding the family contexts in which children with varying degrees of malnutrition live.

Purpose of the Study

The research was designed to investigate whether intrahousehold resource allocation and decision making patterns relate to child nutritional status in rural Kenya. The purpose was fivefold:

- To compare fathers' and mothers' inputs on all intrahousehold resource and decision making variables.
- 2. To determine whether there is a relationship between child nutritional status and mothers' input variables such as time, income, food, and allocation influence.
- 3. To investigate whether there is a relationship between child nutritional status and fathers' input variables such as time, income, food, and allocation influence.
- 4. To determine whether there is a relationship between

child nutritional status and intrahousehold input variables such as family size, family developmental stage, household income, perceived financial adequacy, cooking facilities, food variety, and dietary quality.

5. To determine whether children's variables such as sex, age, birth order, and morbidity or health condition predict their nutritional statuses.

Research Objectives

Based upon the review of literature, more information is needed concerning how intrahousehold resource allocation is transformed into the child welfare output as nutritional status. The goal of this research, therefore, was to examine how intrahousehold resource allocation and decision making patterns relate to the nutritional status of young children ages three to six years. More specifically the objectives were to:

- Assess children's nutritional status and health condition.
- 2. Investigate the differences between fathers' and mothers' inputs in various areas of decision making.
- 3. Investigate the differences between fathers' and mothers' time allocation for child care, household production, subsistence production, and market economy production.

- 4. Investigate the differences between fathers' and mothers' perceptions of financial adequacy and intrahousehold resource (income and food) allocation influence.
- 5. Investigate the differences between fathers' and mothers' perceived participation in household and farm task allocation.
- 6. Determine whether child nutritional status varies according to socio-economic status, decision making inputs, and child related variables.
- 7. Determine whether intrahousehold resource variables such as family size, family developmental stage, socioeconomic status, decision making, time, money, food, and allocation patterns predict child nutritional status.
- 8. Determine whether child related variables such as gender, age, birth order, morbidity, or health condition predict child nutritional status.

Conceptual Framework

In order to address the various aspects of this research, selected aspects of two conceptual frameworks were employed. These included the family resource management model (Deacon & Firebaugh, 1988), and the ecology of human development model (Bronfenbrenner, 1979; 1986).

Family Resource Management Model

In this model, Deacon and Firebaugh (1988) conceptualize family resource management as a system comprised of inputs consisting of demands such as the physiological need for air, food, and water, and resources, both human and nonhuman. Human resources include skills, abilities, knowledge, health, energy, and time while nonhuman resources encompass natural and processed consumption goods, housing, household capital, physical energy, money, and investments. Throughput is the transformation of matter, energy, and/or information by a system from input to output; throughput comprises planning and implementing processes. Output is matter, energy, and/or information produced by a system in response to input and from throughput (transformation) processes. Outputs of a managerial system are referred to as demand responses and resource changes.

In this research the focus was on the relationship that intrahousehold inputs and throughputs had on the output of child nutritional status. Input variables were represented in part by food allocation strategy and time allocation for household production including child care time, farm production, and market economy production. Other input variables were represented by household income from all sources which is used to purchase material goods such as

food, clothing, shelter, medicine, and cooking facilities. Children's variables of gender, age, birth order, morbidity, health status, and food intake were also included as inputs. Throughput variables were represented by parents' perception of participation in decision making processes (participation, implementation, autonomy, dominance, and cooperation) which determine the pattern of allocation of intrahousehold resources. Children's nutritional statuses represented the output of the system under investigation. An adaptation of this model with an ecological emphasis is depicted in Figure 1.

The Ecology of Human Development

Bronfenbrenner (1979; 1986) viewed the ecology of human development as a scientific study of the progressive mutual accommodation between an active growing human being and the changing properties of the immediate environment in which the developing person lives. He believed that human development research should focus on the developing person, the environment, and the evolving interaction between the two. The theorist posited five levels of environmental systems in relation to the developing person. These levels are the microsystem, mesosystem, exosystem, macrosystem, and chronosystem.

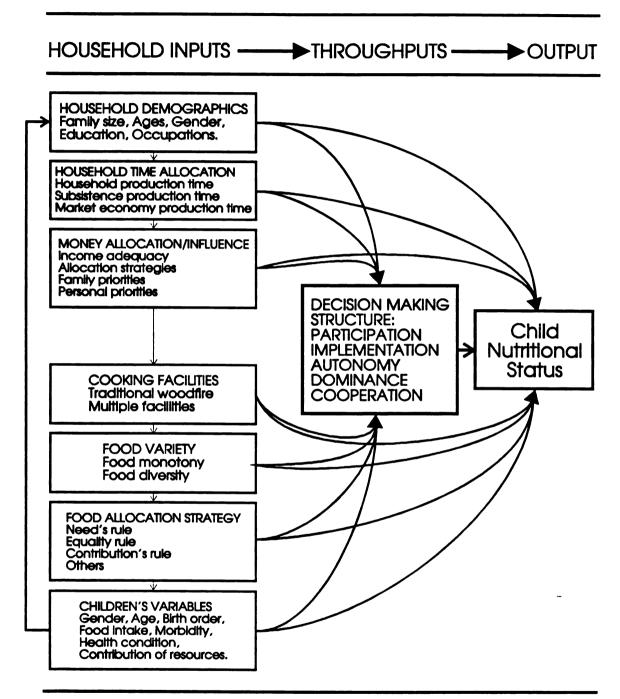


Fig. 1. Proposed framework for analysis: the hypothesized predictors of child nutritional status.

The microsystem is conceptualized as a pattern of activities, roles, and interpersonal relations experienced by the developing person in a given setting with particular physical and material characteristics. The family is the principal microsystem setting in which activities, roles, and interpersonal relations are essential elements. mesosystem involves settings beyond the immediate in which the individual participates, for example the preschool institution the child attends. The exosystem is an extension of the mesosystem in which the child does not participate, but significant others do. This is exemplified by parents in their workplace which indirectly influences the child. The macrosystem is the broader social context of values, norms, and institutions of a given culture. example is the Kenya national food policy which has implications for preschool children's nutrition. chronosystem is a more recent parameter (Bronfenbrenner, 1986) used to examine changes and continuities over time as the child interacts with the environment. For the purposes of this study the focus was the child's microsystem, namely the family.

Definitions

Both conceptual and operational definitions of all the variables under investigation in this study are

elaborated in the instrumentation section of methodology in Chapter III.

Research Questions

The following questions were generated for the study:

- 1. To what extent do fathers and mothers participate in various areas of decision making?
- 2. How do fathers and mothers allocate time for various family tasks?
- 73. To what extent are child care and household tasks shared by various household members?
 - 4. How much participation do fathers and mothers contribute to household and farm task allocation?
 - 5. What kind of support do sons and daughters contribute to the household?
- o. Do parents display gender preference? If so, do their sons and daughters receive differential resource allocations depending on the parent who controls the resource?
- 7. Do fathers and mothers differ in their income allocation strategies and priorities for expenditure?
- 8. Do fathers and mothers differ in their participation and strategies for allocating food to their children?
 - 9. What is the condition of preschool children's

nutritional status?

- fathers and mothers?
 - 11. What is the condition of children's morbidity?
- 12. What are preschool children fed? A Un who
 - 13. Is there a significant difference between fathers' and mothers' perceptions of:
 - The allocation of time for household production, subsistence production, and market economy production?
 - Description in resource allocation (income allocation, food allocation, household task allocation, and farm task allocation)?
 - c. Participation in decision making?
 - d. Participation in decision implementation?
 - e. Decision making autonomy?
 - f. Decision making dominance?
 - g. Cooperative decision making?
- 14. Does child nutritional status vary according to:
 - a. The levels of education of fathers and mothers?
 - b. The types of occupation of fathers and mothers?
 - Perception of income adequacy? Prese lace
 - d. Child gender preference?
 - e. Child morbidity?

- f. Child health care-giver?
 - g. Child meal manager?
 - h. Child's contribution to household resources?
- / i. Decision making structure?
- 15. Does child nutritional status depend on:
 - a. Family size (number of children)?
 - b. Family developmental stage?
 - Mothers' indicators of socio-economic status?
 - d. Fathers' indicators of socio-economic status?
 - Overall family socio-economic status indicators combined?
 - f. Mothers' time allocation?
 - g. Fathers' time allocation?
 - h. Mothers' income and food allocation influence?
 - i. Fathers' income and food allocation
 influence?
 - j. Decision making structure (participation, implementation, autonomy, dominance, and cooperation)?
 - k. Cooking facility available in the household?
 - we l. Child's food variety?
 - m. Food allocation strategies applied within the household?
 - n. Children's variables (sex, age, perceived child health condition, and food intake)?

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16. Which variable (decision making, time, income, food, or allocation patterns) contributes most to child nutritional status? For each variable, does it make a difference which family member contributed it?

Organization of the Study

This study is organized into five chapters: Chapter I, Introduction, includes the statement of the problem, the purpose of the study, the research objectives, conceptual frameworks as they relate to the study, research questions, and hypotheses. Chapter II, Review of Literature, includes relevant studies done in Kenya and other parts of the world. Chapter III, Methodology, includes the research design, instrumentation, hypotheses, description of the study area, sampling procedure, data collection, data analysis plan, and limitations of the study. Chapter IV, Presentation and Analysis of Data, includes sample characteristics, description of the study variables, and hypothesis testing. Chapter V, Discussions and Conclusions, includes discussion of results for the study variables, conclusions, implications of the study, and suggestions for future research.

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CHAPTER II

REVIEW OF LITERATURE

This section contains the review of related literature on research which has been conducted in Kenya and other parts of the world. The review is limited to the following topics which form the major components of the present research namely: child health and nutritional status, decision making, and intrahousehold resource allocation with particular emphasis on income, food, and time allocation.

Health and Nutritional Status

In its broadest sense, health has been defined by the World Health Organization (WHO) as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity (WHO, 1958, p. 459). Since it is difficult to translate such a definition into quantitative terms, more specific indicators have been sought. The presence or absence of certain defined diseases has been used as one type of health indicator, and nutritional status as another (Kocher & Cash, 1979).

Sims (1971) defined nutritional status as the state of health of an individual as conditioned by choice and amounts

of foodstuffs eaten. Due to the nature of the above definition, there is no one single measure of nutritional status. Anthropometric measurements, clinical evaluation, biochemical tests and dietary intake assessments are some of the methods used to indicate the nutritional status of an individual. According to Austin (1976), anthropometric measurements such as weight for age, height for age, and weight for height are considered to be direct nutritional indicators. The child's nutritional status is inferred from his or her physical growth measurements. Physical growth is based on standardized anthropometric measures of height, weight, arm circumference, and triceps skinfold thickness. Height is generally regarded as the best indicator of extended nutritional deficiency. Weight indicates the present nutritional status of the child (Yarbrough & Habitch, 1974).

In order to provide objective data reflecting the nutritional status of Kenyan children at the national and local levels, the Central Bureau of Statistics (CBS) conducted three child nutritional surveys using a nationally representative sample (CBS, 1977; CBS, 1979; CBS, 1983). In 1977, results showed that 30 percent of preschool children suffered from mild-to-moderate protein-energy malnutrition (PEM), and 2.5 percent suffered from severe PEM in the form of marasmus and kwashiorkor. Malnutrition was attributed to inequalities in of income, seasonal localized food

shortages, and lack of nutrition education (CBS, 1977). Two years later, CBS (1979) conducted a second child nutrition survey across the country. Results showed that 24 percent of preschool age children (0-6) suffered from mild-to-moderate malnutrition, while another 1.7 percent suffered from severe PEM.

In response to these two surveys on child nutrition, the Kenyan government came up with a national food policy in 1981 (Kenya, 1981). The objective was to ensure self-sufficiency in foodstuffs, security of food supply for each area of the country and distribution equity. The goal was that every Kenyan would have a nutritionally adequate diet.

The findings of the third survey on child nutrition found that not all members of the population were able to enjoy a nutritionally adequate diet. Thirty percent of preschoolers were found to have mild-to-moderate malnutrition and 2% had severe malnutrition (CBS, 1983). These statistics tended to show a decrease between 1977 and 1979, and an increase between 1979 and 1983. The reasons for these changes have not been established.

A multiplicity of factors have been found to relate to child health and nutritional status. Goduka (1987) investigated the relationship between malnutrition, physical growth, and behavioral development of Black South African children. She found that the area of residence, home environment, parents' socio-economic status, family

structure, and mobility were all related to child growth and development. Anthropometric measurements of height, weight, and head circumference were used for physical growth.

Other investigators have shown that malnourished children come from families with a lower educational level (Caliendo & Sanjur, 1978; Hertzler & Vaughan, 1978), inadequate finances (Hoorweg, Niemeijer & Steenbergen, 1984), single-parent households (Hertzler & Vaughan) and large families (Caliendo & Sanjur; Hoorweg et al.). Thus demographic characteristics of the family have been found to correlate with low nutritional status of children. The importance of family demographic variables indicate that household dynamics play an important role in transforming household inputs into outputs of benefit to children. Such dynamics include decision making and intrahousehold resource allocation elaborated in the next section.

Decision Making

The measurement of decision making power within households poses some conceptual problems. First, genuine differences of opinion are likely to exist among household members as to who makes what decisions. Second, people may not admit the true allocation of influence. A third consideration is that decisions take place in a context which limits alternatives (Rogers, 1990). Studies indicate

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that women and men make decisions which pertain to their own spheres of activity, and female contribution to household decision making is usually greater than either party will publicly acknowledge (Safilios-Rothschild, 1990). For example, research undertaken in rural Kakamega of Western Kenya showed that women whose husbands worked in Nairobi, and only visited for about one month per year, had difficulty admitting that they made all agricultural decisions by themselves. Such an admission would indicate that husbands no longer played a dominant role in the family and would shake the established sex-stratified order.

In the same vein, in Mombasa, Kenya, Safilios-Rothschild (1990) reported that in areas in which men had poorly paid, marginal occupations, the incomes women earned through group projects were controlled by the men, and the women were not able to acquire prestige or decision making power as a function of such income. However, the author noted that when men are able adequately to support their families there is considerable evidence of substantial male adaptability to women's increased income-earnings. The more secure men are in their breadwinner role, the more adaptable they are to women's income ability, probably because women's incomes do not represent a threat to their "superior" position as males. In a study in Mombasa, Kenya, where husbands had a stable and sufficient economic base, women were able to translate their economic contributions into a

valuable resource that earned them more decision making power and more equality in the division of labor (Safilios-Rothschild, 1990).

Income Allocation

The economic model of household decision making which suggests that all family members act as a unit to maximize their mutual good is not a particularly accurate model for decision making in many low-income households. Engle (1990), Dwyer (1983) and Bruce and Dwyer (1988) have summarized a number of investigations indicating that male and female household members do not pool their incomes, or pool them only incompletely. Under conditions of greater poverty, pooling is even less common. A spouse is often kept ignorant of the amount the other earns. In a survey of 300 mothers in a Guatemalan town, 41% of the mothers reported that their husbands did not know how much they earned.

There is evidence that all income which enters a household is not treated identically (Engle, 1990). Women reported that they have much greater control over the income which they earned directly than that which is earned by their husbands. Guyer (1980) suggested that the income earned by women is disproportionately spent on food and basic household necessities, in comparison with men's

income.

Kumar (1978) found in India that in households where women worked for wages, their incomes were more highly correlated with their children's nutritional status than were total household income or men's wage income. Engle (1990) has also suggested that mothers' incomes are positively related to children's mortality and nutritional status.

The hypothesis that mothers are more likely than fathers to spend income for the immediate food and health needs of their children has been generated. Engle has postulated that differential spending patterns could depend on differences in attachment, on mothers' and fathers' prescribed roles in a particular society, or on differences in each parent's ability to perceive the needs of the child.

Lamb (1982) defined attachment as specific enduring relationships characterized by the infants' use of proximity to adults as a means of assuring protection and care. In Lamb's studies, infants appeared to have become attached to both their mothers and fathers during their first year. In the second year however, most infants turned to their mothers when distressed. Both mothers and fathers tended to respond similarly to infants' signals, but consistent differences in the kinds and frequencies of these responses have been noted, suggesting that mothers tended to respond more often than fathers.

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Another explanation is that fathers may assume that mothers bear the primary responsibility for nurturing. Engle (1990) reported a study in Nigeria where fathers of children hospitalized for severe protein-energy malnutrition were asked to identify its causes. Over 35% of the fathers felt that their children's malnutrition was primarily the mothers' responsibility, although the episode may have been caused by poor sanitation, poverty, and responsibilities shared by the family, rather than lack of maternal attention.

Intrahousehold Resource Allocation

Guyer (1980) claimed that household members had unequal access to the goods owned or obtained by the household. The concept of joint ownership by the household rather than by individuals is inapplicable in many settings particularly in Africa. Food, health care, and education are allocated within the household according to the perceived economic contribution of the members. The term "perceived" is critical since a lot of productive work which contributes to real household income does not enter the market sector, and thus may not be recognized in the household's economy. Examples of nonmarket production include food processing and preparation, child care, and household maintenance. This kind of work conserves rather

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than earns income, but since no economic transaction takes place, the value of the service is often not recognized.

Therefore the providers of such services have less access to household resources.

In setting out to explore the issue of intrahousehold resource allocation, Rogers (1990) claimed that individual incomes were not simply pooled and then spent to meet household needs in some unified fashion. They were spent at least in part according to the earners' own preference. The author also maintained that households follow allocative rules which did not always protect the most vulnerable members. Rules of exchange governing both the kind of resources allocated and their amount seem to exist in all cultures (Foa & Foa, 1980).

Leventhal (1980) has identified three allocation rules and the conditions under which they are applied. According to him, human beings believe that rewards and punishments should be distributed in accordance with recipients' inputs or contributions. This school of thought suggests that all exchanges are based on a notion of a just reward for contribution. In support of the above contributions rule, Engle (1990) documented that in Guatemala, an adult worker received more food than did the children. Workers ate a slightly higher proportion of the family's calories than nonworkers, controlling for age and sex.

A study carried out in Brazil, also illustrates a

contributions rule. Scheper-Hughes (1984), described infanticide and underinvestiment in some children, which she believed indicated that when a child is not expected to be a long time contributor to the household fewer resources are directed to that child. Consciously or unconsciously the family provides fewer of its resources to, or simply neglects the care of some children, while allocating more resources to other children and adults. The characteristics associated with the child in whom the family underinvests are: high birth order, female sex, short intergestational period, and sickliness. In this case, equity theory or contributions rule suggested that families would not allocate more resources such as food to a needy or malnourished child because his or her contribution is nonexistent or very minimal.

In contrast to the contributions rule there is a second type of exchange based on a needs rule (Leventhal, 1980). In this case a mother would give her last bit of food to a sickly child rather than a hungry well child.

A third distribution rule is equality. This means that each person should receive an equal share of the available food. When mothers apply this rule, younger and smaller children receive relatively more than older and bigger family members, a consequence that would follow logically from the practice of giving relatively equal proportions to each person.

Food Allocation

Food is in some ways one of the best indicators of allocation of consumption goods. Consumption of health care and education services is conditional on a variety of factors including service availability and perceived need. But all households at every economic level consume food, and food represents a critical element in human capital formation in addition to being a consumption item (Rogers & Schlossman, 1990).

Distribution of food within the family often fails to meet the needs of all members when the quantities available are barely adequate. There is evidence of discrimination against women and girls in food distribution in South Asia where women's economic roles are circumscribed (Grewal, Golpadas & Garde, 1973). In India, differential allocation of resources among children was parallel to their potential economic roles. A parallel finding from African studies showed that females were favored in household resource distribution in areas where a high dowry is paid (Schofield, 1974). Where dowry is not paid, girls did not receive as large a share of the households' food. Other studies in Africa have found that females do consume less than their proportionate share of food.

According to Safilios-Rothschild (1990), gender is a key distributional criterion at the household level. It can

be used as a proxy for income earning capacity, since women have less access to paid employment and income than do men. In many instances, women have no job or income earning opportunities at all. Poor households, in which food and access to health care and education are scarce, allocate these resources on the basis of gender and age priorities. Alternatively in households which are not constrained by scarcity of resources, there is no need to make difficult allocation decisions: male and female members of all ages tend to have a greater probability of equal access to resources than in poor households. Which rule is applied depends on many factors, including the type of resource, the resource constraints, the values of the resource distributor and the allocation decisions made (Engle, 1990).

Time Allocation

Another major intrahousehold resource is time allocation because time is a critical element in most households. Time allocation theory has been based on the assumption that people in general experience their time as scarce and allocate it among alternative activities in order to maximize individual utility or personal satisfaction (Johnson, 1990). The application of this theory is complicated in a household context where members cannot be assumed to have the same priorities or interests.

Closely related to the question of time availability is task allocation among household members. In most cultures, different kinds of work are considered suitable for different household members. These distinctions encompass the sexual division of labor as well as division by age and status in the household. In Sub-Saharan Africa, husbands and wives have explicit responsibility for different aspects of household maintenance (Rogers, 1990).

One major human resource the family has is the time of its family members (Bennett, 1990). Time can either be used to produce services for the family, i.e. household production such as food preparation, house care, clothing care, and child care, or it can be used for unpaid subsistence production of food and other goods on the family farm, which is an income-sparing activity, or a wage/salary activity in the market which generates income. Women play a dual role in most households in developing countries, being both mother/caretaker and economic provider. These two roles however can cause conflicts in time use and in the allocation of responsibilities. The debate is whether women's income-generating work results in an improvement or a deterioration in the health and nutritional status of their children, given the potential conflict with their caretaking role. However, most women have no choice about whether or not to work. Instead the issue is how to balance paid work either in the form of wages or in-kind payments

with child-care responsibilities.

Bennett (1990) further recommends that research be carried out on the trade-offs between child-care responsibilities and other family roles, as conditioned by the economic and socio-cultural environment. Such research should also seek to examine what other family members, kin group, and social/support groups are contributing in terms of household production and income generation, and whether or not these contributions are associated with household decision making patterns in ways that would relate to child health and nutritional status.

According to Kumar and Hotchkiss (1988) the main determinants of preschool child nutrition in Nepal are household income, household size, and work loads of women and children. In addition the researcher also found that food preparation time was positively associated with the amount of fuelwood used and negatively with the amount of time spent in fuelwood collection.

In many households, fetching water is a time consuming task often occupying one household member full-time. Piped water or a conveniently located borehole reduces the time and labor significantly (Rogers, 1990). In support of this finding, Bouis and Haddad (1990) found that increase in income was associated with improved primary water sources, that are closer to the house, improved toilet facilities, and better housing as measured by flooring and roofing

materials.

Summary

In summary, there is evidence in the literature that children's nutritional status is an important family welfare output and deserves attention. It has been demonstrated that some family contexts maximize children's nutritional status, while others fail to do so. It has also been demonstrated that children also influence those who influence them. Therefore, it is essential to include characteristics of children such as gender, age, morbidity, health condition, and contribution to household resources in assessing nutritional status. (At this point, socio-economic status is the most prevalent predictor of nutritional status The intrahousehold resource allocation dynamics mentioned. √ and decision making structure were not the focus of the reviewed studies nor were they used as predictor variables. The lack of empirical evidence regarding the contribution of resource allocation and decision making variables on child nutritional status supported the need and purpose for this study.

CHAPTER III

METHODOLOGY

Research Design Overview

The purpose of this study was to investigate the relationship between intrahousehold resource allocation and decision making patterns as they relate to the nutritional status of young children. The research objectives were achieved through a descriptive, non-experimental, cross-sectional, survey design. The procedures related to instrumentation, description of the study area, sampling, data collection, and data analysis are elaborated in this chapter.

Instrumentation

A detailed interview guide for fathers and mothers covering all aspects of the research was developed by the researcher after an intensive review of literature. The interview-questionnaire focused on seven major variables: household demographics, household task and time allocation, family income and its allocation, perception of participation in decision making and implementation, child

feeding, child health status, and anthropometric
measurements of weight and height (see Appendices A, B, &
C).

This section contains the definitions of the variables under investigation in this research. Each definition has two parts: first a conceptual definition followed by its operational definition. The major dependent variable is child nutritional status, while intrahousehold resource allocation and perception of participation in decision making are the major independent variables under investigation.

One with the participation of participation in decision.

Child Nutritional Status

This refers to the physical condition of the child as influenced by the utilization of the nutrients (Robinson & Lawler, 1977). Nutritional status was measured by obtaining data on the indices of height and weight. These measures were then compared with the National Center for Health Statistics (NCHS) reference standards (American Public Health Association, Undated). In order to define the child's nutritional status three classification systems were used: the World Health Organization (WHO), the Centers for Disease Control (CDC)) and the NCHS. The three dependent variables were height for age, weight for age, and weight for height. According to the WHO system weight for age at or below the 3rd NCHS percentile is considered malnourished,

while the 3rd to the 50th percentile is considered normal. Using the height-for-age parameter, the CDC consider any measure below the 5th percentile as stunted or chronically undernourished and any measure at or above the 5th percentile as adequate. Using the weight for height parameter, the NCHS system classifies children below the 5th percentile as severely malnourished, 5th to 10th percentile as moderately malnourished, and 25th to 75th percentiles as normal.

Child Health Status

Health is the state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, 1958: 459). However due to the complexity of measuring health according to the above definition, fathers and mothers were asked to provide information on the symptoms, duration and treatment of any type of illness that their child may have suffered during the 4 weeks prior to the interview, and the parents' perception of the child's overall health condition. In addition, the researcher observed the children for any signs of malnutrition or morbidity. Scores were obtained for observed child health ranging from 0 to 2 with 0 representing a sickly condition and 2 representing a healthy condition. Perceived health condition was measured on a 4 point scale relative to the child being mostly sick to mostly healthy.

Household Demographics

This refers to marital status, ages, genders, education, occupations, household size, composition, headship, and ethnicity. Each of these variables is defined below.

Marital Status. The parents were asked to state
whether they were: (a) married, living with spouse, (b)
never married, (c) separated, (d) divorced, (e) widowed, (f)
living together, not married.

Parents' Ages. Parents' were asked to state their ages. During data analysis these data were collapsed into categories of: (a) 20 to 24 years, (b) 25 to 34 years, (c) 35 to 44 years, (d) 45 to 54, (e) 55 to 64, and (f) 65 or older.

Occupation. The parents were asked to indicate whether they were employed or not, if employed they were asked to state the type of farming, business, industry, or service in which they were engaged. During data analysis, these data were collapsed into categories of: (a) farmers, (b) quarrystone cutters (c) teachers (d) unskilled workers, (e) semiskilled workers, (f) skilled workers, (g) para-professionals (h) students.

Educational Level. Parents were asked to indicate the highest grade or year of regular school they had completed. These data were collapsed into categories of: (a) no schooling, (b) primary school 1 to 8, (c) high school Form 1

to 6, (d) 1-2 year post-secondary training, (e) 2-year diploma, (f) bachelor's degree, (g) beyond bachelor's degree.

Household Composition. The parents were asked to state the number of children related to them by blood, marriage and/or adoption, the number of children alive, and the number that died under 5 years. Nonnuclear family members who lived in the household and their relationship to the parents were also recorded.

Household Head. The parents were asked to state who was the head of the household. These data were collapsed into categories of: (a) father, (b) mother, (c) other.

Ethnicity. Parents were asked to indicate their ethnic origin or descent. These data were categorized according to the ethnic groupings in Kenya: (a) Kikuyu and (b) Kamba.

Time allocation

This is the distribution of periods in hours among alternative activities. Fathers' and mothers' time allocation data served as an indicator of the alternative uses of each parent's time and of the total time constraints on the household. Time allocation was measured by asking the respondents to recall all the activities they performed or participated in, on the day prior to the interview.

Information was sought on how much time in hours they spent on each activity. Specific time use data on paid work, farm

work, housework, fetching water, collecting firewood, food preparation, and child-care were recorded.

Family Income

This is the stream of money, goods, services, and satisfactions that come under the control of the family to be used to satisfy needs and desires, and to discharge obligations. There are three types of income: money, real, and psychic (Nickell & Dorsey, 1967,pp. 232-235). Money income is the purchasing power in Kenya shillings and cents that comes into a family in a given period of time. accrue to the family in the form of wages, salary, dividends, interests, profits, gifts, pensions, and inheritances. Real income is nonmoney flow of goods and services used or available for any given period of time e.g. owned property, possessions used by the family, food furnished by a garden, house, car, household equipment, durable goods, knowledge and services rendered by members of the family. Psychic income is the intangible and subjective flow of satisfactions which results from the use of other resources such as money and real incomes. This research examined money and real incomes. Family income was measured by gathering information on eight specified indicators including farm income, personal wages, house type, water source, cooking facility, cash crops, food crops, livestock, poultry, automobile ownership, savings, and perception of

the family income condition.

Money Income Allocation

This is distribution of money income among alternative ends. Income allocation was measured by examining the sources of income, who brought it in, whether it was pooled or not, who was in charge of pooled income, what pooled income was spent on, and who spent it. The research also investigated how income was allocated among basic family needs. Comparisons were drawn between family and personal priorities, as well as between husbands' and wives' priorities for income use, and perception of participation in income allocation.

Food Allocation

This is the distribution of food among family members. Food allocation was measured by asking fathers and mothers how food was allocated to their children. During data analysis these responses were coded into categories of (a) age, (b) sex, (c) need, (d) equally, (e) according to child's contribution to household resources, (f) availability, (g) share from a common plate.

<u>Decision making</u>

This is a basic activity of the family organization concerned with integrating values, goals, standards, and

resources in such a fashion that action results. Decision making is also defined as choosing among alternatives (Paolucci, Hall & Axinn, 1977). Decision making structure was measured by asking who participated in making family decisions on a variety of activities, who implemented those decisions, how the decisions were made, and how much participation husbands and wives thought they had in the allocation of time, income, and food. Decision making structure was examined by administering a series of questions to husbands and wives pertaining to 16 family tasks that are commonly performed at home to determine (a) who decided about each task, and (b) who implemented each task. A measure of decision making dominance was obtained by examining the proportion of items in which one parent decided and the other implemented. If a task was decided upon and implemented by both husband and wife together this indicated cooperation. Instances where each decided over personal behavior (decisions and implementation) indicated autonomy ` (adapted from Keefe, 1972).

Dietary Quality

This was measured by examining the extent to which a child's diet in one 24-hour recall period satisfied the Three Food Group Pattern (protein, carbohydrates, vitamins and minerals). The diets were scored with one point for each of the food categories mentioned by the food-giver.

There was no indication of individual food item quantity or nutritive value of the diet using this dietary quality scoring method (adapted from Caliendo & Sanjur, 1978).

Food Variety

Food variety is a function of the total number of different foods consumed by the child during a one week period. The food-giver was asked whether the child had been given anything different from the 24-hour dietary recall over a 7-day period. The 7-day recall was scored with one point for each food item mentioned that was different from the 24-hour recall. The intent here was to determine variety in the child's diet based on the notion that the key to a nutritionally adequate diet is a variety of different food items.

Hypotheses

Hypotheses that reflected the purpose, objectives, and conceptual frameworks for this study are presented in this section. Question 13 related to the differences between fathers' and mothers' intrahousehold resource allocation variables is addressed in hypotheses one through seven. Question 14 generated hypotheses eight through nineteen which focus on the possible differences in child nutritional status according to intrahousehold resource variables.

Question 15 pertaining to the relationships between child nutritional status and intrahousehold resource allocation variables is addressed in hypotheses twenty through thirty-seven. Research questions one through twelve are addressed in the descriptive analysis section of chapter IV. Research question sixteen summarizes the findings of the study. The null and alternate hypotheses were:

- Ho-1. There is no difference in the allocation of time for household production, subsistence production, and market economy production between fathers and mothers.
- Ho-2. There are no differences in the perception of financial adequacy, participation in income allocation, food allocation, household task allocation, and farm task allocation between fathers and mothers.
- Ho-3. There is no difference in decision making autonomy between fathers and mothers.
- Ho-4. There is no difference in decision making dominance between fathers and mothers.
- Ho-5. There is no difference in perception of cooperative decision making between fathers and mothers.
- <u>Ho-6</u>. There is no difference in participation in decision making between fathers and mothers.
- <u>Ho-7</u>. There is no difference in decision implementation

- between fathers and mothers.
- Ho-8. There are no differences in child nutritional status by mothers' levels of education.
- Ho-9. There are no differences in child nutritional status by fathers' levels of education.
- Ho-10. There are no differences in child nutritional status by mothers' occupations.
- Ho-11. There are no differences in child nutritional status by fathers' occupations.
- Ho-12. There are no differences in child nutritional status by parents' perception of income adequacy.
- Ho-13. There are no differences in child nutritional status by child gender preference.
- Ho-14. There are no differences in child nutritional status by child morbidity.
- Ho-15. There are no differences in child nutritional status by child health care-giver.
- Ho-16. There are no differences in child nutritional status by child meal manager.
- Ho-17. There are no differences in child nutritional status by child's contribution to household resources.
- Ho-18. There are no differences in child nutritional status by participation in decision making.
- Ho-19. There are no differences in child nutritional status by decision making autonomy.

- Ho-20. There is no relationship between child nutritional status and family size.
- Ho-21. There is no relationship between child nutritional status and family developmental stage.
- Ho-22. There is no relationship between child nutritional status and mothers' indicators of family socio-
- Ho-23. There is no relationship between child nutritional status and fathers' indicators of family socioeconomic status.
- Ho-24. There is no relationship between child nutritional status and overall family socio-economic status.
- <u>Ho-25</u>. There is no relationship between child nutritional status and mothers' time allocation.
- Ho-26. There is no relationship between child nutritional status and fathers' time allocation.
- Ho-27. There is no relationship between child nutritional status and mothers' income and food allocation influence.
- Ho-28. There is no relationship between child nutritional status and fathers' income and food allocation influence.
- Ho-29. There is no relationship between child nutritional status and mothers' participation in decision making.
- Ho-30. There is no relationship between child nutritional

- status and fathers' participation in decision making.
- Ho-31. There is no relationship between child nutritional status and mothers' decision making autonomy. ✓
- Ho-32. There is no relationship between child nutritional status and fathers' decision making autonomy.
- Ho-33. There is no relationship between child nutritional status and cooperative decision making structure.
- Ho-34. There is no relationship between child nutritional status and type of cooking facility used in the household.
- Ho-35. There is no relationship between child nutritional status and child's food variety.
- Ho-36. There is no relationship between child nutritional status and food allocation strategy applied within the household.
- Ho-37. There is no relationship between child nutritional status and child's sex, age, birth order, number of siblings, perceived health condition, and quality of food intake.

The Kenyan Ecological System

According to Ojany and Ogendo (1973), Kenya is located approximately between latitudes 4 degrees north and 4 degrees south, and between longitudes 34 degrees and 42

degrees east on the eastern part of Africa. In terms of the natural environment, the country has an area of 224,960 square miles of which 2.3 percent is water. Of the dry land, about two-thirds is either semi-desert or desert. The country has two prevalent climatic types: hot equatorial type and tropical continental type. Droughts and floods are common features due to rainfall anomalies. They cause great difficulty for an essentially agricultural people who depend on farming large marginal areas. Kenya is not rich in surface water resources except the Lake Victoria and Tana river areas. Much of Kenya's water is underground and can be reached at an average depth of 260 feet below the surface. Much of this water has not been developed except in the cities.

In terms of rainfall, about 15% of the country receives an average of about 760 millimeters, 14% receives between 760 and 560 millimeters, and about 70% receives less than 560 millimeters annually (Nelson, 1984). Droughts affecting the whole country occur on the average every 8 to 10 years for a period of 2 to 4 years. There are two rainfall seasons: the long rains occur from April to May, and the short rains occur between October and November. The rest of the year is dry season with occasional showers. June through September is cool and dry, while December through March is hot and sunny. Average temperatures range between 45 and 90 degrees Fahrenheit throughout the year

(Nelson, 1984).

Water is one of the most important basic needs in people's lives. In most parts of the country, water is not readily available and people particularly women and children have to travel long distances in search of it (Kenya, 1989). In parts of the country served by rivers and streams, the hilly terrain makes water supply to families an expensive and difficult undertaking. In the dryland areas, people depend on storm water which is collected in man-made ponds. In the urban centers, water supply tends to fall short of the requirements of the rapidly increasing population. most cases available water is inadequate or untreated. 75% of the urban population of four million has access to reliable clean water supply, while only 26% of the rural population estimated at 20 million enjoy similar facilities. Overall only 35% of the total population of about 25 million is assured of clean water supply at reasonable distances.

Agriculture is the mainstay of Kenya's economy. Medium and high potential land constitutes only 18% of the total land area with the population density of arable land rising from 171 in 1988 to 209 in 1993 (Kenya, 1989). Agriculture provides a livelihood for 85% of the population. Production of basic foodstuffs usually meets domestic needs except when there is drought. Majority of the rural population is engaged in both agriculture and livestock activities. Private enterprises are encouraged and the government

welcomes foreign investors. Multinational corporations such as Del Monte are involved in agriculture and manufacturing. The major exports are coffee and tea, while the major imports are oil, machinery, and transport equipment.

Kenya does not have mineral resources of international importance or significant quantities (Nelson, 1984). The main minerals are soda ash, fluorspar, and limestone. The major sources of energy are wood and hydroelectric power. Hydroelectric power is used in urban centers and for industrial purposes. Wood provides most of the energy used by the rural population.

In relation to the political system, Kenya became independent from the British in 1963. It is a democratic country with many political parties. The country is divided into eight administrative provinces and 40 administrative districts. Kenya's population of 24 million is composed of a variety of ethnic groups (Carle, 1991). There are 42 different tribes ranging in number from 1000 to 4 million people. There are cultural differences between these people largely determined by their tribal practices, traditional occupations (farming, fishing, and livestock keeping), and food habits. In terms of religion, 76% profess Christianity (31% are Catholics, 27% are Protestants, 18% are adherents of Independent African Churches). Muslims comprise 6% and 18% are believed to be adherents of African traditional religions (Nelson, 1984).

As far as education is concerned, there is no policy that stipulates mandatory schooling, however, school enrollment has risen sharply since Kenya became an independent republic in 1963. The age of entry into a formal preschool is 3 years, while that of primary school is 6 years. In 1991, literacy rate for males was 70% and for females 49%. In relation to health services, there is shortage of medical personnel as well as drugs. In 1984, there was one doctor per 10,000 and one nurse per 2,500 people. Malaria, childhood diseases, parasitic infections, and malnutrition are the most serious health problems facing the population. Environmental sanitation is a concern in both rural and urban centers (Central Bureau of Statistics, 1986).

In terms of transportation, most people travel by foot.

Rural residents travel long distances to fetch water,

collect firewood, and to the markets. Low income workers in

the cities also walk long distances to the industrial

centers where they work. Next to walking, the bus system is

the most widely used mode of transportation in Kenya both in

urban as well as rural areas. Less than 20% of the road

system is tarmac or made of all weather materials. Most

rural access roads are earth roads and almost impassable

during the rainy seasons. Railroad is used mainly for cargo

and for people who travel long distances across the country.

There are two international airports and one international seaport.

In terms of the family system, Kenyan families were polygamous (polygynous is more sociologically correct) until recently. Today that is the exception rather than the practice. This shift is more closely related to economic decisions than any other reason. Men cannot economically maintain more than one wife and her children. Similarly the extended family system has slowly evolved into a nuclear form for the same economic reasons, as well as rural-urban migration. Family living space has changed from multiple dwellings to a single dwelling per family. Socio-economic class differences are extremely wide. United Nations Development Program (1990) reported that 10 million people (rural and urban) live below the poverty level.

Kenya's population growth rate of 4.0% per annum is the highest in the world. Unless measures toward effective methods of growth rate reduction are implemented, the country will continue to experience problems in feeding her people and providing employment for her working population. There is a constraint of available high potential land, and there are no inexpensive means of bringing large amounts of arid and semi-arid land into productive use. These constraints have an adverse effect on the environment for the development of children and families.

Description of the Study Area

The area of study included one sublocation of Thika Division which is about 80 kilometers northeast of Kenya's capitol city of Nairobi. The total area is 23 square kilometers with a density of 132 persons per square kilometer. In the 1979 census data, there were 638 households with a total population of 3061. The average household size was 4.79. About 90 percent of the population is Kikuyu and 10 percent Kamba by ethnicity. The cultural practices between these two ethnic groups are similar however, they do have some differences in food habits. extended family system is prevalent in this area. Family living space is characterized by multiple dwellings in one homestead. The houses are constructed mainly of mud with iron roofs, and occasionally with timber, brick or stone There is no electricity and piped water system reaches less than 5% of the population. The rest have to fetch water several miles away from home. The level of sanitation is poor since provision of safe water to households has not been accomplished yet. This part of the country receives an average rainfall of less than 665 millimeters annually. The sublocation is situated on the leeward side of Mount Kilimambogo, which is about 5000 feet high. The people practice mixed agriculture of subsistence crops such as maize, beans, potatoes, and papayas alongside

indigenous pastoralism. There is no cash crop farming, although the area is suitable for cotton growing. The area is deforested and it is surrounded by Del Monte, a US Multinational Corporation that grows pineapples for export via irrigation. In general the area is deprived in terms of its natural environmental resources such as rainfall, forests, and fertile soils.

Sampling Procedures

The sample was selected from a rural sublocation in Thika Division of Central Kenya. The target population was rural families with preschool children ages 3 to 6 years. Sampling technique included several phases: first, identifying 438 families who met this criterion with the help of the Chief (a Local Government Officer in charge of the location) and a research assistant (an Adult Education Officer who had lived and worked in the area for 20 years), secondly selecting random samples from this list of eligible families, and thirdly identifying the oldest child within the 3 to 6 year age range. A total of 101 households that met this criterion participated in the study.

Data Collection

Authority to conduct research in Kenya was granted by the Office of the President, the District Commissioner, the District Officer, and the Chief of the location. The nature and purpose of the research was explained to parents and then consent to participate in the study was sought. data for this study were collected by the researcher and one male research assistant. Simultaneous interviews conducted in the local language were administered face to face by the researcher and the male research assistant in the respondents' home or as otherwise arranged by appointment. The researcher interviewed mothers and the male research assistant interviewed the fathers. This is culturally appropriate as well as research appropriate in that couples did not have an opportunity to influence each other's responses. The time required to conduct the interviews ranged from 30 to 40 minutes. In general the families were very cooperative. Data were gathered between October 1992 and January 1993.

All anthropometric measurements were taken by the researcher. Height was measured with a portable stature measurement board consisting of a footpiece, a headpiece and a tape measure which was permanently fixed to the board. The measuring board was placed on a hard flat surface against a wall or a table, and the child was asked to remove

any footwear and stand on the footpiece with the feet together. The child was instructed to stand upright and look straight ahead at the parent in front of the child. The research assistant helped to position the child correctly and the researcher lowered the headpiece on top of the child's head and read the measurement to the nearest 0.1 centimeter and recorded it on the form. Weight was measured with a Hanover weighing scale. The child was instructed to stand still with both feet together on the middle of the scale facing the display. Upon steadying, the displayed weight was read by the researcher and recorded on the form.

Data Analysis

The study was designed to determine the relationships between the major dependent variable, child nutritional status and the independent variables of intrahousehold resource allocation and decision making patterns. There was no attempt to interpret causality. Variables were treated as either ordinal or interval level data. The data were entered into the computer by the researcher and then checked for accuracy by comparing responses on the original instruments with computer printouts. All data analyses that followed were completed using the SPSSx computer program on the MSU mainframe facility.

A descriptive analysis of the data was done first to

determine the frequencies of each of the variables, followed by a qualitative analysis of the open-ended questions. Differences between fathers' and mothers' inputs in intrahousehold resource allocation and decision making variables were assessed with paired T-tests. Paired T-tests were performed on mean scores for all variables measured on the interval level scale. The T-test procedure was designed to test whether or not the difference between two sample means is significant. Step two of the analysis involved the application of univariate analysis of variance to identify the means that were significantly different at the .05 level for all factors measured on ordinal level scale. Step three of the analysis applied stepwise multiple regression analyses to help elucidate the complex relationships among variables measured on interval level scale. For all data analysis, two-tailed tests were performed because the researcher wanted to treat fathers' and mothers' variables equally, and the level of significance to reject the null hypotheses was set at .05.

Limitations of the Study

There were several limitations identified in this research. The first was the sampling design. The selection of a rural sample that is socio-economically deprived in a semi-arid region of Kenya is a limitation. Therefore the

results cannot be generalized for the entire rural population in Kenya.

Secondly the researcher was limited to incidental cross-sectional data collected at one point in time. For instance reliance on recall and self-report to obtain information on time use is less reliable than recall with direct observation. People may not know the exact amount of time they spend on a given task. In addition some activities done by some members may not be recognized as work by others. The same limitation applies to dietary recall: respondents may not be able to recall everything that a child was fed within a 24-hour period or over a 7-day period.

The potential confounding variables for child nutritional status was a third limitation. Some of the parameters used to assess nutritional status such as the height for age index is much more fixed by genetic endowment than the weight for age index. Nutritionists and physical anthropologists believe that the 'quasi-normal' growth in the first year and the lower growth rate after age one are related to environmental deprivation. As an interactionist, the researcher believes that growth is the product of both heredity and environment. How much contribution is accounted for by each is a persistent question yet to be investigated.

The use of NCHS growth curves as a reference standard

for African children has its own limitations in that comparisons were drawn between physical development of African children and their North American counterparts.

Most of the data was nominal, ordinal, or open ended categories necessitating extensive data reduction procedures to develop scales that approached as nearly as possible, equal interval properties, or the use of dummy variables so that parametric statistical procedures could be used at the analysis stage.

Travelling to Africa to collect data without funding had its own limitations including reduced time spent in the field over one lean agricultural season, and selection of a small sample size from one sublocation in Central Kenya.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

The data presented in this chapter were gathered from 283 respondents in 101 rural households in Thika Division of Central Kenya. Of the families that participated in the study, 92 were fathers, 94 were mothers, and 97 were children.

Sample Characteristics

The characteristics elaborated in this section include household demographics and household incomes.

Household Demographics

The children in the sample were comprised of 49 males (50.5%) and 48 females (49.5%). The children ranged in age between 32 to 92 months with an average of 53.5 months. At the time of the study, 33 (37.9%) children were 3 years or younger, 27 (31.0%) were 4 years old, and 27 (31.0%) were 5 years or older.

Family ethnicity was reported to be Kikuyu by 89% of both fathers and mothers, and Kamba by 11% of both

fathers and mothers. There were no mixed marriages in the sample. The fathers who responded ranged in age from 24 to 64 years with an average age of 38.6, while the mothers ranged in age from 20 to 56 years with an average age of 30.6. As indicated in Table 1, all the fathers and 96% of the mothers were married, while 4% of the mothers were single, divorced, or widowed.

The number of children in the sample families ranged from one to 13 with an average of five children per family. Child mortality under 5 years was reported by 24 (25.5%) mothers who had lost one child, and three (3.0%) mothers who had lost two children. In relation to the age of the oldest child the range was two to 30 years. There were 24 (26.4%) families in which the oldest child was in the 3 to 6 year age range specified for this study. Family life developmental stage was determined by the age of the oldest child. There were 58 (66.7%) families in the preschool and school age stage, where the oldest child was 12 years or younger and 29 (33.3%) in the adolescent and launching stage, where the oldest child was 13 years or older. The age of the youngest child in the families ranged from 1 to 6 years. There were 82 (94.3%) families in which the youngest child was in the 3 to 6 years age range.

In relation to education level of the parents (see Table 1), 11% of the fathers and 22% of the mothers had no schooling at all, 66% of the fathers and 61% of the mothers

had some primary education, 12% of the fathers and 8% of the mothers had some secondary education, and 3% of the fathers and 2% of the mothers had one to two years of post-secondary training.

Table 1
Marital Status and Education Levels of Parents

Factor	Fatl	ners	Mothers		
	n	*	n	ફ	
Marital Status					
Married	92	100	90	95.7	
Widowed	0	0	2	2.1	
Single	0	0	1	1.1	
Divorced	0	0	1	1.1	
Education Level					
No Schooling	11	12.0	22	23.7	
Primary	66	71.7	61	65.6	
Secondary	12	13.0	8	8.6	
Post-secondary	3	3.3	2	2.2	

In terms of occupation, 18% of the fathers and 93% of the mothers were subsistence (peasant) farmers, 3% of the fathers and 2% of the mothers were teachers, 31% of the

fathers were unskilled or semi-skilled workers, while 4% of mothers were in similar occupations, and 40% of the fathers were quarry or stone cutters (see Table 2).

Table 2
Occupations of Fathers and Mothers

	Fatl	ners	Mothers		
Occupation	n	*	n	*	
Subsistence Farmers	16	17.8	85	93.4	
Quarry-stone cutters	36	40.0	0	0	
Unskilled Laborers	10	11.1	1	1.1	
Semi-skilled Workers	18	20.0	3	3.3	
Skilled Workers	5	5.6	0	0	
Para-professionals	1	1.1	0	0	
Teachers	3	3.3	2	2.2	
Students	1	1.1	0	0	

Seventy-two percent of the fathers and all the mothers worked within the location, while 15% of the fathers worked outside their location of residence.

Household Incomes

Data on household incomes were gathered from six specified indicators including farm ownership, farm income, monthly cash income, house type, savings, and debts.

Results showed that only 17% of the fathers owned farms ranging in size between under 1 acre to 5 acres. Of those who owned farms, 8% had been settled by the government, 3% had purchased the land, and 1% had inherited it from their parents. The rest had either leased or were living on their parents' farms.

Due to a severe drought in 1991 and 1992 the majority of the mothers and two-thirds of the fathers reported zero incomes from their farms. Only 37% of the fathers reported that they obtained farm incomes ranging from Kenya shillings 100 to over 9000 with an average of 1990.3 in 1992 (\$1.00 was equivalent to 35 Kenya shillings). All fathers reported monthly incomes ranging from 200 to 7000 shillings, with an average of 1873.5, while only 16% of the mothers reported receiving monthly incomes ranging from 100 to 1000 shillings with an average of 468.6. Given the meager nature of these incomes 86% of the fathers and 39% of the mothers felt that the income they received from all sources was not enough for their families to live on, while 3% of the fathers and 46% of the mothers felt that their incomes were sufficient.

Similarly 86% of the fathers and 58% of the mothers

reported having no savings, while 76% of the fathers and 50 percent of the mothers were in debt. The sources of the loans or credit for both fathers and mothers included banks, employers, shopkeepers, friends, neighbors, and relatives. Despite their impoverished conditions, 62% of the fathers reported that in addition to their own children, they had other extended dependents who included their aged parents and siblings. A fourth of the mothers reported being in a similar condition where their parents, parents in-law, and grandchildren depended on them. Both fathers and mothers reported that several conditions had led to their current financial difficulties: the 1991-1992 drought, unemployment, irregular incomes, insufficient incomes, high cost of living, uncontrolled food prices, large families, needs exceeding the income, being in debt, and lack of savings.

A mutual network of assistance was observed in receiving and donating of various gifts in this community. Twenty seven (26.7%) of the fathers reported that they had received gifts in form of money (5.0%), food (9.9%), seeds for planting (3.0%), and several combinations of the above gifts (3.0%), while 21 mothers reported receiving money (1.0%), food (13.9%), and seeds for planting (2.0%). Some families also reported donating gifts to other families. Fathers reported giving away money (16.8%), food (13.9%), several gifts (19.8%), while mothers reported giving money (2.0%), food (24.8%) and seeds (3.0%).

An observation of the type of houses the study families lived in showed that 9% lived in traditional mud and grass thatched roofs, 73% in mud and corrugated iron sheet roofs and 17% in timber, brick or stone houses. Only 4% of the families had access to piped water, the rest obtained their water from rivers, dams, shallow wells or boreholes for a distance ranging from less than a mile to 4 miles. Sixty four percent of the families relied exclusively on traditional woodfire cooking facility, while the rest used the woodfire in combination with charcoal or paraffin cookers. About half of the families obtained their firewood from nearby forests, the rest collected wood from their farms or purchased it from the market.

In summary, the sample consisted of approximately equal numbers of boys and girls, and slightly more mothers than fathers. Most of the children came from a two-parent household (96%) and the remainder from a one-parent household. More than half of the families were in the preschool and school age stage of the family life cycle. Two-thirds of the sample children represented the youngest child in the family. Ethnicity of the family was predominantly Kikuyu. Most of the mothers were unemployed subsistence farmers while most of the fathers were employed in low-income occupations. In general incomes were in the lower range and as in all other cultures, women's incomes lagged behind the men's incomes. Anyone earning Kenya

shillings 1000 or less per month is considered below the poverty level. This means that all the mothers and one-fourth of the fathers were earning incomes below the poverty line. The modal monthly earning was less than 2500 shillings which is considered low income. On the upper end of the continuum, only 1.0 percent of the fathers earned above 5000 shillings. In relation to education, more than two-thirds of the fathers and mothers had less than 8 years of formal schooling.

Description of the Study Variables

This section elaborates the findings of the first twelve research questions for the study.

Research question 1. To what extent do fathers and mothers participate in various areas of decision making?

Decision making structure was examined by administering a series of questions pertaining to 16 family tasks to determine who decided about each task and who implemented each task. A parent was considered dominant if he or she decided and implemented a specified task. In cases where both fathers and mothers jointly decided and implemented a task, cooperation was indicated. Table 3 indicates that both fathers and mothers concurred in their responses that mothers were dominant in deciding and implementing household

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maintenance or service oriented decisions such as what to eat, food preparation, housework, child care, and chicken care. There was cooperation in decisions pertaining to gift giving, lending money and taking a loan as reported by both parents. Activities which either mother or both parents decided upon and implemented include health care, farm work, and animal care. Activities which either the father or both parents decided upon and implemented include children's education, clothing expenditure, building a house, and buying a farm. Both fathers and mothers decided where to procure food and both implemented the decision. There were no reports of fathers deciding and implementing any activity on the list independently.

Respondents were asked how they made decisions and 63% of the fathers reported that they made decisions as need arose, 31% according to a family plan, and 5% decided alone. Seventy two percent of the mothers reported that they made decisions according to a family plan and 5% as need arose.

Research Question 2. How do fathers and mothers allocate time for various family tasks?

Data were collected on how fathers and mothers allocated time among alternative family tasks encompassing household production, farm production, and market economy production. Since data were gathered on all days of the week including Saturdays and Sundays, the mean hours may be

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Table 3.

Decision Making by Fathers (F) and Mothers (M)

Activity	Respondent		Dec	Decision		Implementation		
		F	M	Both	F	M	Both	
		ફ	8	४	*	8	*	
What to eat	Father	8	86	7	7	88	5	
	Mother	13	59	11	9	65	8	
Where to procure food	Father	49	42	10	38	50	12	
rood ,	Mother	42	12	29	30	25	28	
Housework /	Father	5	80	13	4	82	13	
	Mother	0	80	1	0	79	1	
Food preparation	Father	0	91	8	0	91	8	
	Mother	0	78	3	0	77	4	
Child care	Father	0	73	23	0	73	23	
%	Mother	0	72	7	0	72	7	
Medical care	Father	7	27	66	5	25	70	
1th eritualia	Mother	0	67	14	1	67	13	
Buy Clothing	Father	42	15	42	42	14	44	
	Mother	19	36	26	20	36	26	
Education	Father	55	2	23	54	3	24	
	Mother	28	8	40	28	8	39	
Buy farm	Father	47	0	16	48	0	15	
	Mother	32	3	48	31	5	46	

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Table 3 (cont'd)

Activity	Responde	Respondent		Decision		Implementation		
		F	M	Both	F	M	Both	
		8	*	8	ક	*	8	
Build house	Father	70	1	16	70	1	16	
	Mother	32	2	49	32	3	48	
Farm work	Father	1	33	60	1	33	60	
	Mother	2	55	26	2	54	26	
Animal care	Father	20	7	18	20	8	18	
	Mother	4	37	4	3	37	4	
Chicken care	Father	3	48	12	3	48	12	
	Mother	0	53	5	0	53	5	
Give gift	Father	15	3	69	16	3	68	
	Mother	10	20	53	8	21	54	
Lend money	Father	28	3	57	28	3	58	
	Mother	13	37	33	9	38	36	
Borrow money	Father	35	2	63	33	2	64	
	Mother	16	13	54	15	17	51	

an underestimate of the time actually worked during the day. However, since the intent was to examine to what extent family tasks are shared between fathers and mothers, the daily means were useful in that regard. Results indicated

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that fathers spent most time on paid employment, farm work and animal husbandry. Mothers spent most time on farm work, child care, and fetching water. Table 4 shows the frequency distribution of time among the different tasks.

Table 4.

Household Task and Time Allocation in Hours

Activity	Fathers	Mothers
Paid work ~	3.90	0.75
arm work	1.35	3.27
hild care /	0.42	2.05
etching water	0.09	1.05
usework /	0.14	0.98
ollecting firewood	0.07	0.78
nimal husbandry	0.76	0.31
ther my repend	0.38	0.11

Research Question 3. To what extent are child care and household tasks shared by various household members?

Information was sought on the care of young children ages 3 to 6 by administering a series of questions pertaining to eight child related tasks to determine to what extent child care tasks were shared among household members.

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Table 5 shows the results as reported by fathers and mothers. The results indicate that mothers were predominantly involved in the care of their young children in all eight tasks except story telling and playing with child, where all family members and siblings were involved respectively.

As far as household tasks were concerned, 98% of the fathers and 35% of the mothers felt that household tasks were allocated according to gender, 2% of the fathers and 25% of the mothers felt that tasks were allocated equally between males and females in the household.

However 98% of the fathers reported that household responsibilities were transferable among male and female members when the mother was sick (75%), when there was a lot of work to be done (3%), whenever the father was available (7%), in some selected activities (2%), where spouses worked together (2%), and in the case of a full-time househusband (1%). In contrast to the fathers' responses, only 27% of the mothers reported that household responsibilities were transferable across genders in case of a sick spouse (3%), or when a spouse was available (1%).

Research Question 4. How much participation do fathers and mothers exercise in household and farm task allocation?

In relation to the amount of participation in household task allocation, 35% of the fathers reported no participation at all, 52% reported some participation and

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Table 5
Care of Young Children

Activity	Respondent	Dad	Mom	Granny	Siblings	Maid	All
		*	*	8	8	8	*
Primary caretaker	Fathers	0	71	6	0	1	19
carecaker	Mothers	0	86	2	0	0	12
Meal	Fathers	5	86	9	0	0	0
manager	Mothers	2	97	1	0	0	0
Prepare food	Fathers	1	86	0	1	0	4
	Mothers	2	96	0	0	0	2
Feed	Fathers	1	79	0	1	0	7
child	Mothers	1	92	0	0	0	5
Bathe/	Fathers	0	83	0	2	0	3
dress	Mothers	1	94	0	0	0	3
Health	Fathers	26	70	0	0	0	4
care	Mothers	4	93	0	0	0	2
Story	Fathers	42	42	0	4	0	12
telling	Mothers	9	25	0	11	0	13
Play with	Fathers	4	6	0	10	0	75
child	Mothers	0	4	0	88	0	8

13% reported that they participated a lot. A majority (99%) of the mothers reported that they participated a lot and 1% reported some participation. On examining participation in

farm task allocation, results showed that 11% of the fathers did not participate, 37% participated in some way and 52% participated a lot. On the other hand, 1% of the mothers reported no participation, 20% participated in some way, and 50% participated a lot.

Research Question 5. What kind of support do sons and daughters contribute to the household?

Contributions by children included household, subsistence, and market economy production. Table 6 is a summary of the type of support sons and daughters contributed into their households. Results indicate that sons' major contributions include farm work, housework, and animal care. Daughters' main contributions include housework, farm work, and child care.

Research question 6. Do parents display gender preference? If so, do sons or daughters receive differential resource allocations depending on the parent who controls the resource?

In relation to gender preference, 62% of the fathers and 68% of the mothers reported that they did not give their sons or daughters preference for any resource allocation (Table 7). However, 6% of the fathers and 4% of the mothers reported that they did. In relation to educational resources, 22% of the fathers and 10% of the mothers preferred to devote resources to improve the education of their sons rather than their daughters. Reasons for the

Table 6
Resources Contributed by Children

Resource	Respondent	Sons	Sons		Daughters	
		n	*	n	ક	
Farm work	Fathers	27	23	16	13	
	Mothers	34	38	20	20	
Housework	Fathers	50	43	89	77	
	Mothers	29	32	61	60	
Child care	Fathers	6	5	10	8	
	Mothers	2	2	18	18	
Animal care	Fathers	23	20	0	0	
	Mothers	18	20	0	0	
Errands	Fathers	6	5	2	2	
	Mothers	4	4	2	2	
Money	Fathers	4	4	6	6	
	Mothers	2	2	0	0	

preference by fathers included responses such as sons stand a better chance of being employed, sons assist aged parents, sons perform better, sons' needs are less, educating sons prevents them from crime involvement, and daughters are more likely to drop out of school due to pregnancy. Mothers had identical responses as the fathers. There was also evidence for differential health care: more fathers reported that they would spend resources to improve the health of their sons than their daughters.

Mothers did not report giving any differential health care treatment to either sons or daughters. In relation to food allocation, mothers reported that more sons than daughters received more food. However, both fathers and mothers reported that more daughters than sons contributed more resources to their households. Both fathers and mothers reported that in general daughters spent more of family resources than sons. The responses included reasons such as female clothing is more expensive than male clothing, more daughters than sons in the family, and daughters spent more time at home (consuming resources) than sons.

Parents may have differential preferences with respect to investments in sons relative to daughters. Attempts to measure gender bias in the intrahousehold resource allocations suggested that sons tended to be favored in education investment, health care, and food allocation. Part of these differences can be ascribed to the amount of resources a child contributed into the household or was expected to contribute in the future. The assumption that fathers prefer their sons to be healthy and educated than daughters is supported. However the assumption that mothers are more concerned about the health and education of their daughters is rejected. Like fathers, mothers preferred to

Table 7

Parents' Responses to Gender Preference

%	N	^
		*
5.9	4	4.0
61.4	68	67.3
21.8	10	9.9
1.0	1	1.0
9.9	11	10.9
25.7	11	10.9
4.0	9	8.9
5.0	0	0.0
2.0	1	1.0
46.5	13	12.9
8.9	2	2.0
2.0	13	12.9
2.0	14	13.9
2.0	12	11.9
0.0	10	10.0
6.9	0	0.0
	0.0	0.0 10

Table 7 (cont'd)

Variable	Fath	ers	Mothe	ers
Level	N	8	N	8
Contributes more re	esources			
Sons	4	4.0	15	14.9
Daughters	10	9.9	19	18.8
Both	17	16.8	11	10.9
None	3	3.0	1	1.0
Spends more resource	ces			
Sons	9	8.9	18	17.8
Daughters	26	25.7	23	22.8
Both	12	11.9	10	9.0
None	5	5.0	0	0.0

invest resources to improve the education of their sons rather than their daughters. However, mothers did not demonstrate any significant differential preferences with respect to health care for sons over daughters. In addition, male children of parents who reported differential preferences with respect to food allocation to sons relative to daughters had higher nutritional status scores than female children. Therefore the male gender tended to be favored over the female gender. One interpretation of these

results is that fathers and mothers care more about the development of their sons than daughters because sons are expected to "repay" those favors to their parents in old age, whereas daughters are given away in marriage and become care-givers to others outside their family of origin. There is therefore evidence for gender bias in the allocation of intrahousehold resources allocation such as education, health care, and food.

Research Question 7. Do fathers and mothers differ in their income allocation strategies and priorities for expenditure?

pooled, and if so who was in charge of the pooled income, and how it was allocated. Results indicated that a higher percentage of fathers (69%) than mothers (56%) reported that they pooled their incomes. However there was no agreement as to who was in charge of the pooled income. Seventy percent of the fathers reported that they were in charge of the pooled income, mothers were in charge in 18% of the households and both parents were in charge in 12% of the households. On the contrary 55% of the mothers reported that both parents were in charge of the pooled income, 4% of the mothers were in charge, and 12% of the fathers were in charge of pooled income. There were similarities, however, between husband and wives as to what the pooled income was

that were similar included food, health, clothing, education, farm improvement, animal husbandry, and small business enterprises (see Table 8).

Both fathers and mothers ranked in order what they individually perceived as family priorities. There were similarities in what the family priorities were but differences in the rank ordering. The categories that were similar included food, health care, clothing expenditure, education of children, farm improvement, livestock management, and small scale income generating businesses. In addition to the above list, fathers had clearing debts, savings, housing, and transportation as family priorities. Table 9 summarizes the family priorities for income use.

Food and clothing appear to have been the major family priorities for expenditure for this sample. Education runs third probably because most of the families were in the early family developmental preschool age stage that requires minimal education-related expenses.

Fathers who reported that they did not pool their incomes and that they were in charge of their personal incomes (22%) disclosed that they spent their personal wages on a combination of both family needs (food, clothing, housing, transportation, clearing debts, savings, transportation, farm, animal or business enterprises) as well as their own personal needs such as drinking, smoking, and entertaining.

Table 8

Pooled Income Expenditure

Category	Fatl	Mot	ners	
	n	8	n	8
Food	63	68.4	56	59.5
Clothing	59	64.1	26	27.6
Education	33	35.8	33	35.1
Housing	11	.11	2	.02
Farm/Animal/Business	8	.08	6	.06
Health	5	.05	7	.07
Transportation	1	.01		

Although 17% of the mothers reported that they were in charge of their personal incomes which was not pooled, they did not distinguish personal from family priorities. It appears that they used their personal incomes to meet family needs unlike the fathers who used nonpooled personal incomes to meet their own personal needs (see Table 10).

On decision making, one-fifth of the fathers felt that they made all family financial decisions compared to 3% of the mothers in that position. Eighty eight percent of the fathers and 4% of the mothers reported that they had a lot of influence in income allocation, 7% of the fathers and 56%

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Table 9
Family Priorities for Expenditure

Category	Respondent	1st		2nd		3rd	
		n	*	n	8	n	8
Food	Father	77	76	4	4	0	0
	Mother	28	28	3	3	0	0
Clothing	Father	0	0	52	52	23	23
	Mother	0	0	9	9	5	5
Education	Father	0	0	16	16	19	19
	Mother	2	2	15	15	3	3
Health	Father	0	0	2	2	9	9
	Mother	0	0	1	1	0	0
Farm/Anim/Buss	Father	0	0	1	1	2	2
	Mother	2	2	1	1	3	3
Fathers' addit	ional list						
Clear debts	Father	2	2	4	4	7	7
Savings	Father	1	1	0	0	0	0
Housing	Father	1	1	2	2	8	8
Transportation	Father	0	0	0	0	2	2

of the mothers reported they had some influence, and 5% of the fathers and 23% of the mothers reported that they had no influence in income allocation.

Table 10
Personal Priorities for Expenditure

Category	Respondent	1st	1st		2nd		
		n	ક	n	ક	n	*
Farm/Anim/Buss	Fathers	0	0	1	1	0	0
	Mothers	10	10	3	3	1	1
Food	Fathers	2	2	0	0	0	0
	Mothers	7	7	1	1	0	0
Clothing	Fathers	3	3	1	1	0	0
	Mothers	1	1	2	2	0	0
Health	Fathers	0	0	0	0	0	0
	Mothers	1	1	0	0	1	1
Education	Fathers	0	0	0	0	0	0
	Mothers	0	0	1	1	1	1
	Mothers	1	1	0	0	1	1
Fathers' addit	ional list						
Drink/smoke	Fathers	8	8	11	11	7	7
Savings	Fathers	3	3	0	0	2	2
Transportation	Fathers	2	2	5	5	3	3
Clear debts	Fathers	1	1	0	0	2	2
Housing	Fathers	1	1	0	0	0	0
Housing	Fathers	1	1	0	0	0	(

The research sought information on who allocated the pooled income and how it was allocated among family members. Table 11 summarizes the results as reported by fathers and mothers.

Table 11
Income Allocation

Category		Fathers		Mothers	
	n	*	n	*	
Allocates Pooled Income					
Father	37	36.6	7	6.9	
Mother	5	5.0	1	1.0	
Both Parents	22	21.8	50	49.5	
Parents & Children	6	5.9	1	1.7	
llocation Strategy					
As need arises	62	68.9	5	5.0	
Family budget	20	22.2	50	49.5	
Earners' desire	4	4.4	19	18.8	
Pooled income keepe	r 1	1.1	2	2.0	
Several strategies	3	3.3	0	0.0	

As these percentages indicate, more fathers reported that they allocated money income than both parents and

mothers combined. On the other hand, almost half of the mothers reported that money income allocation was a joint activity between spouses rather than an individual activity. In relation to income allocation strategy, a high proportion of fathers reported using ad hoc income allocation strategies as need arose, as compared to half of the mothers who reported that they used a planned family budget. On the other hand a greater proportion of mothers reported that income was allocated according to earners' desire than did the fathers.

Research Question 8. Do fathers and mothers differ in their participation and strategies for allocating food to their children?

Decisions pertaining to food preparation and allocation are usually associated with mothers. This research sought to know how much participation fathers and mothers thought they had on food allocation. Seventy eight percent of the mothers compared to 8% of the fathers reported that they participated a lot, 21% of the fathers and 2% of the mothers reported that they participated in some way, and 56% of the fathers reported that they did not participate at all. These findings indicate that all the mothers and less than one-third of the fathers participated in food allocation activities. More specifically the research sought to know who was the child's meal manager and 89 (88.1%) mothers reported that they decided what their

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preschool child was fed, and 4 (4%) fathers reported that they did. Food is one indicator of the allocation of consumption goods and families distribute the available food among its members in different ways. Table 12 summarizes the findings on how fathers and mothers allocated food among their children in general, and to their preschool child in particular.

Table 12
Food Allocation Criteria

Criteria	Father	s	Mother	S
	n	*	n	8
For all children				
Child's need	52	51.4	53	52.5
Availability	15	14.9	1	1.0
Equality	6	5.9	5	5.0
For preschool child				
Child's need	60	59.4	73	72.3
Availability >	17	16.8	2	1.0
Equality _	0	0	6	5.9
Common plate	0	0	5	5.0
Sex /	3	3.0	0	C
Age ~	0	0	1	1.1

These findings indicate that various allocative rules were applied to food distribution, the most frequent being child's need, followed by availability, and equality. It is worth noting that other criteria were applied to the preschool child such as age, sex, and the sharing from a common plate which were not applied to all children in general.

Research Question 9. What is the condition of preschool children's nutritional status?

The major child variable was nutritional status as measured by the indices of height for age, weight for age, and weight for height. These measures were then compared with the National Center for Health Statistics (NCHS) reference norms (US Department of Health, Education and Welfare, 1977). The justification for using NCHS norms as a reference standard for Kenyan children is that Kenyan urban middle-class and wealthy children, as well as children of wealthy rural families are at or above NCHS median values (Stephenson, Latham, & Jansen, 1983). The World Health Organization (WHO) Advisory Committee consider the NCHS data as the most suitable reference standard for international comparison (WHO, 1983). The frequency distribution of the children's physical growth measurements are shown in Tables 13 and 14.

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Table 13

Mean Height and weight by Sex and Age

Factor level		He	ight	We	Weight	
	Cases	Mean	SD	Mean	SD	
Males	49	98.8	8.5	14.0	2.4	
Females	47	98.6	8.5	14.0	2.2	
Sexes combined	96	98.7	8.5	14.0	2.3	
32-47 months	33	92.4	6.4	12.4	1.5	
48-59 months	27	98.8	5.8	13.9	1.8	
60-83 months	26	106.7	5.6	16.1	2.0	
Ages combined	86	98.7	8.4	14.0	2.3	

According to Table 13 there were no differential growth patterns between boys and girls.

There were 36 (41.8%) children considered stunted or chronically undernourished in that their heights for age were less than the 5th percentile of the NCHS reference norms, and 50 (58.1%) were considered adequately nourished in that their heights for age were at or greater than the 5th percentile (Table 14). Using the weight for age indicator, 41 (47.7%) children were considered malnourished and 45 (52.3%) were considered normal.

Table 14
Classification of Child Nutritional Status

System	Ref. Pop	Method	Classification
Weight for Ag	e (W/A)	18.0	
WHO (1978)	NCHS	Percentile	< 3rd: Malnutrition
			3rd to 50th: Normal
<u>Height for Ag</u>	e (H/A)		
CDC (1980)	NCHS	Percentile	< 5th: stunted
			> 5th: adequate
Weight for He	ight (W/H)		
NCHS (1976)	NCHS	Percentile	< 5th: severe maln
			10th-25th: moderate
			25th-75th: normal
			> 75th: overweight
WHO Combined	<u>Indicators</u>	of Child Nutri	tional Status
Normal W/H +	Normal W/A	+ Normal H/A	Normal
Normal W/H +	Low W/A + I	ow H/A	Normal & stunted
Normal W/H +	High W/A +	High H/A	Normal & Tall
High W/H + Hi	gh W/A + Lo	w H/A	Obese
High W/H + No	rmal W/A +	Low H/A	Overfed & stunted
High W/A + Hi	gh W/A + No	ormal H/A	Overfed

Table 14 (cont'd)

90th

95th

•	,					
Combined indi	icator	5		Cl	assific	cation
Low W/H + Low	w W/A	+ High H/	A	Cu	rrently	y underfed
Low W/H + Low W/A + Normal H/A					rrently	y underfed
Low W/H + Nor	rmal W	/A + High	H/A	Cu	rrently	y underfed
Percentile	Heid	ght/Age	Weid	ght/Age	Wei	ght/Height
reicentile	n	%	n	anc, age	n	%
< 5th	34	33.7	41	40.6	33	34.4
5th	2	2.0	8	7.9	9	9.4
10th	13	12.9	17	16.8	15	15.6
25th	15	14.9	9	8.9	26	27.1
50th	12	11.9	2	2.0	9	9.4
75th	8	7.9	2	2.0	2	2.0

Weight for height parameter reflects current nutritional condition, weight for age indicator reflects both acute and chronic malnutrition, and height for age

2 2.0 1 1.0 1

0 0.0 0

1.0

0.0

0.0

parameter reflects past nutritional history. According to WHO (1983), all children with <u>high</u> weight for height are <u>overfed</u>, all children with <u>low</u> weight for height are <u>underfed</u>, and all children with <u>normal</u> weight for height are <u>not malnourished</u> regardless of the classification of the other 2 parameters (weight for age and height for age).

Using the age independent parameter of weight for height, 33 (34.4%) children were considered severely malnourished, 24 (25.0%) were moderately malnourished, and 38 (39.6%) were considered normal. Using all three parameters combined, about a fifth (19.8%) of the children were considered severely malnourished, 26.8% were categorized as moderately malnourished, 9.9% were classified as moderately normal, and 24.8% were considered normal (Table 15).

Research Question 10. What is the status of children's health as perceived by fathers and mothers?

The second variable for the children was health status as perceived by fathers and mothers. The children's health status was rated on a 4-point scale from mostly sick (1) to good health (4). Results are shown on Table 16.

There was high congruence between fathers' and mothers' perception of their children's health status for the categories of mostly healthy and those in good health.

Table 15
Child Nutritional Status

Category	Heig	ght/Age	Weigh	nt/Age	Weig	ht/Height
	n	*	n	*	n	*
Severe-	36	41.9	41	47.7	33	34.4
malnutrition						
Moderate-	0	0	0	0	24	25.0
malnutrition						
Normal	50	58.1	45	52.3	38	39.6
nutrition						
<u>Classificatior</u>	n base	ed on all	3 param	meters (H)	'A, W/	A, & W/H)
<u> Classification</u>				Saoro	N N	<u> </u>
Classification	1			Score	N	*
Classification Stunted, waste		now under	fed	Score	N 20	19.8
	ed & 1			1		
Stunted, waste	ed & r	l & now u	nderfed	1 2	20	19.8
Stunted, waste	ed & r	l & now u	nderfed ow unde	1 2	20	19.8
Stunted, waste Not stunted, waste	ed & r vasted not wa	d & now unasted & now norma	nderfed ow unde: 1	1 2 cfed 3	20 13 14	19.8 12.9 13.9

Table 16

Perceived Child Health Condition

Condition	Father		Mot	Mother	
	n	%	n	8	
Mostly Sick	0	0	6	6.5	
Occasionally Sick	30	32.6	24	25.8	
Mostly Healthy	44	47.8	44	47.3	
Good Health	18	19.6	19	20.4	

Research Question 11. What is the condition of children's morbidity?

The third child related variable was observed child morbidity. The score for this variable was derived from observations of physical signs of malnutrition and other signs of morbidity by the researcher, and parents' reports of illnesses the child had suffered within the month prior to the interview. Results showed that 10 (10.3%) children suffered from observable signs of malnutrition, 23 (22.8%) had running noses, and 36 (35.6%) had no observable signs of morbidity. Table 17 summarizes the reports of children's illnesses as reported by fathers and mothers.

Comparisons between fathers' and mothers' reports are difficult to draw in this case because more than half of the

mothers did not respond to this question. Nevertheless most children were reported to have fever or cold a week prior to the interview. In relation to childhood immunizations, 87 (94.5%) children had been immunized and 2 (2.0%) had not received immunization against childhood diseases.

Immunization is a measurable indicator of nonsusceptibility to specific infectious diseases. Immunization status is not a health outcome, however it is closely linked to childhood

disease rates and is a short term predictor of long-term

changes in disease incidence.

Research Question 12. What are preschool children fed?

The fifth child related variable was dietary quality
assessed from the 24-hour dietary recall (Table 18) and food
variety assessed from the 7-day dietary diversity recall
(Table 19). Children's diets were evaluated in terms of the
total number of foods consumed by the child during a oneweek period. Mothers were asked if they had fed their
children anything different from the 24-hour dietary recall
within the previous week. The diets for each child were
scored with one point for each food group mentioned.
These figures indicate that only 5% of the children consumed
diets which complied with the quality level of the Three
Food Group Pattern. The most limiting factor was bodybuilding (protein) and the second most limiting was
protective (fruit-vegetable) group.

Table 17
Child Morbidity

Condition	Fathers		Mothers	
	n	*	n	*
Fever/cold	43	46.7	29	28.7
Ill in Past Week	19	20.7	41	44.6
Other conditions	2	2.2	3	3.0
Stomach pains	2	2.2	2	2.0
Worms	1	1.1	2	2.0
Diarrhea/vomiting	0	0	2	2.0

Table 18

Dietary Quality

	n	*
2	58	59.7
1	31	31.9
3	5	5.2
	1	1 31

Table 19
Food Variety Scores

Food variety	Score	n	*
Starch	1	29	28.7
Protein	1	3	3.0
Fruit-vegetable	1	2	2.0
Any 2 Food groups	2	27	26.7
All 3 Food groups	3	3	3.0

Food variety scores ranged from 1 to 3 within a one-week period and only 3% of the children enjoyed a variety of foods from all the three food groups.

Hypothesis Testing

The general focus of the hypotheses for this study was
the differences between fathers' and mothers' intrahousehold
resource allocation variables, the differences in child
nutritional status according to intrahousehold resource
Variables, and the relationships between child nutritional
status and intrahousehold resource variables. The theme in
research question 13 was the difference between fathers' and
mothers' intrahousehold resource variables. This question

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is answered by testing hypotheses one through seven. Step one of the analysis involved a father-mother comparison of the independent variables. Paired T-tests were performed on mean scores for all variables measured on the interval level scale. The focus in research question 14 was the difference in child nutritional status according to intrahousehold resource variables. This question is dealt with by testing hypotheses eight through nineteen. Step two of the analysis involved the application of univariate analysis of variance to identify the means that were significantly different at the .05 level for independent variables measured on ordinal level scale. The exposition in research question 15 was the relationship between child nutritional status and intrahousehold resource variables. This research question is answered by testing hypotheses twenty through thirty seven. Step three of the analysis applied stepwise multiple regression analyses to help elucidate the complex relationships among variables measured on interval level Scale.

Research Question 13. Is there a significant difference between fathers' and mothers' perceptions of time, income, and food allocation, and in decision making inputs? This question is answered by testing hypotheses one through seven.

Ho-1. There is no significant difference in the allocation of time for household production, subsistence

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production, and market economy production between fathers and mothers.

The results of paired t-tests on mean scores for time allocation variables are shown on Table 20. Fathers and mothers differed significantly on time allocation. Fathers spent significantly more time on market economy production (paid work) and animal care than mothers. Mothers spent significantly more time on household and subsistence production activities such as child care, housework, farm work, fetching water, and collecting firewood than fathers. The null hypothesis was rejected.

<u>Ho-2</u>. There is no significant difference in the perception of participation in income allocation, food allocation, household task allocation, farm task allocation, and perception of financial adequacy between fathers and mothers.

Paired T-tests performed on mean scores for perception of resource allocation influence and financial adequacy revealed significant differences among the means for these variables as shown on Table 21. Fathers had significantly more influence on income allocation and lower ratings on perception of financial adequacy.

Mothers had significantly more participation in food allocation, household task allocation, farm task allocation and higher ratings on perception of financial adequacy than fathers. This null hypothesis was rejected.

Table 20
Father-Mother comparison on Time Allocation

	Fa	ther	Mo	ther	
Variable	Mean	SD	Mean	SD	T-value
Paid-job	3.90	3.75	0.64	2.08	-7.42*
Children	0.49	1.3	1.91	1.3	5.81*
Housework	0.13	0.40	0.91	1.6	4.91*
Farm-work	1.36	2.01	2.91	1.92	5.77*
Water	0.89	0.29	0.98	1.12	7.57*
Firewood	0.05	0.34	1.70	1.74	9.19*
Animal	0.69	1.46	0.29	0.64	-2.56*
Housework	0.78	1.85	5.50	3.60	11.76*
All subsi	stence w	ork			
	2.04	2.77	3.19	2.20	3.38*

^{*} p < .05

Ho-3. There is no difference in decision making autonomy between fathers and mothers.

Paired T-test performed on mean scores for decision making autonomy indicated that there was a significant difference between fathers' decision making autonomy and mothers' decision making autonomy. There were more instances where mothers decided and implemented family tasks

Table 21
Father-Mother Comparison on Resource/Task Allocation

Variable	Father		Mo	Mother		
	Mean	SD	Mean	SD	T- value	
Income	2.81	0.53	1.72	0.45	-13.14*	
Food	1.31	0.47	2.97	0.17	27.32*	
House	1.75	0.65	2.98	0.11	16.24*	
Financial	1.50	0.58	2.01	0.58	5.54*	
adequacy Farm	2.40	0.66	2.73	0.47	3.13*	

^{*} p < .05

independently than did the fathers (see Table 22). This null hypothesis was therefore rejected.

<u>Ho-4</u>. There is no difference in decision making dominance between fathers and mothers.

The results of paired T-test performed on mean scores for decision making dominance revealed that there was no significant difference in decision making dominance between fathers and mothers (see Table 22). This null hypothesis was retained.

<u>Ho-5</u>. There is no difference in the perception of cooperative decision making between fathers and mothers.

The results of paired T-test on mean scores are shown

on Table 22. There was no significant difference in the perception of cooperative decision making between fathers and mothers. This null hypothesis was retained.

<u>Ho-6</u>. There is no difference in participation in decision making between fathers and mothers.

The results of paired T-test on mean scores are shown on Table 22. There was a significant difference in this variable. This null hypothesis was rejected.

<u>Ho-7</u>. There is no difference in decision implementation between fathers and mothers.

The results of paired T-test on mean scores revealed that there was no significant difference in this variable (see Table 22).

Research Question 14. Does child nutritional status vary according to intrahousehold variables? This question is answered by testing hypotheses eight through nineteen.

<u>Ho-8</u>. There are no differences in child nutritional status according to mothers' levels of education.

According to univariate analysis of variance test results, there were significant differences among the means for child nutritional status according to mothers' levels of education (F = 4.211, df = 1, 76; p = .0436, see Table 23). Children of mothers with secondary education had higher mean scores (4.666) than children of mothers with primary or no schooling experience (3.217). This null hypothesis was rejected.

Table 22

Father-Mother Comparison on Decision Making Inputs

	Fat	her	Moth	er		
Variable	M	SD	M	SD	T-value	Sig.T
Autonomy	.00	.0	.11	.32	35	.001*
Participation	.09	.29	.22	.41	2.3	.024*
Dominance	.00	.00	.06	.37	1.52	.133
Cooperation	.03	.19	.01	.11	1.00	.321
Implementation	.11	.32	.15	.36	.73	.471

^{*} p < .05

Ho-9. There are no differences in child nutritional status according to fathers' levels of education.

No significant differences were evident in the univariate analysis of variance test results for child nutritional status according to fathers' levels of education (F = .186, df = 1, 74; p = .667, see Table 23). Children of fathers with secondary education had a mean score of 3.583, while those of fathers with primary or no schooling experience had a mean of 3.312. This null hypothesis was retained.

<u>Ho-10</u>. There are no differences in child nutritional status by mothers' occupations.

A significant difference was evident in the univariate

analysis of variance test results for nutritional status of children whose mothers were subsistence farmers and those whose mothers were engaged in wage earning occupations (F = 7.999, df = 1, 74; p = .0060, see Table 23). Children of mothers who were unpaid subsistence farmers scored a mean of 3.180 while those of wage earning mothers had a higher mean score of 6.000. This null hypothesis was rejected.

<u>Ho-11</u>. There are no differences in child nutritional status by fathers' occupations.

Significant differences were evident in the oneway analysis of variance test results for child nutritional status according to this variable (F = 3.765, df = 3, 75; p = .0145, see Table 23). Children of fathers in skilled occupations had the leading mean score of 4.454, followed by children of fathers who were farmers (3.500), third, were children of quarry workers (2.828), and finally children of fathers in unskilled irregular occupations (2.571). This null hypothesis was rejected. Results of the Tukey Procedure indicated what pairs of groups were significantly different: means of children of quarry workers and unskilled laborers were found to be significantly different from the means of children of skilled workers.

<u>Ho-12</u>. There are no differences in child nutritional status by perception of family financial adequacy.

A significant difference was evident in the univariate analysis of variance test results for child nutritional

status by perception of financial adequacy (F = 5.706, df = 1, 72; p = .0195, see Table 23). Children of fathers who perceived their incomes as adequate had a higher mean score (6.000) than children of fathers who perceived their incomes as inadequate (3.281). This null hypothesis was rejected.

<u>Ho-13</u>. There are no differences in child nutritional status according to gender preference.

A significant difference was evident in the univariate analysis of variance test results for child nutritional status by gender preference (F = 5.398, df = 1, 8; p = .0487, see Table 24). Male children of parents who reported differential preferences with respect to food allocation to sons relative to daughters had a higher mean score (4.500) than female children (2.125). Therefore male gender tended to be favored over the female gender. This null hypothesis was rejected.

<u>Ho-14</u>. There are no differences in child nutritional status by child's health condition.

A significant difference was evident in the univariate analysis of variance test results for child nutritional status by child health condition (F = 4.899, df =1, 72; p = .0300, see Table 24). Children who had not been hospitalized during the 4 weeks prior to the interview had a higher mean score (3.634) than children who had been hospitalized within the same period (2.545). This null hypothesis was rejected.

<u>Ho-15</u>. There are no differences in child nutritional status according to child health care-giver.

A significant difference was found in the univariate analysis of variance test results for child nutritional status by child health care-giver (F = 4.451, df = 1, 76; p = .0382, see Table 24). Children who had mother alone as care-giver had a lower mean score (3.211) than children who had mother with other helpers as care-givers (4.857). This null hypothesis was rejected.

<u>Ho-16</u>. There are no differences in child nutritional status according to child meal manager.

A significant difference was evident in the univariate analysis of variance test results for child nutritional status by child meal manager (F = 4.275, df = 1, 76; p = .0421, see Table 24). Children who had mother alone as meal manager had a lower mean score (3.266) than children who had mother and other helpers as meal managers (5.666). This null hypothesis was rejected.

<u>Ho-17</u>. There are no differences in child nutritional status according to child's contribution to household resources.

A significant difference was found in the univariate analysis of variance test results for child nutritional status by child's contribution to household resources (F = 6.236, df = 1, 25; p = .0195, see Table 24).

Table 23

ANOVA Results for Child Nutritional Status by SES Factors

Factor	Level	Mean	SD	F	P
Mother Educ	. 0-8 yrs	3.217	2.01		
	9-14 yrs	4.666	1.80	4.2	.0436*
Father Educ.	0-8 yrs	3.312	1.99		
	9-14 yrs	3.583	1.97	.18	.667
Mother Occup	. Employed	6.000	.000		
	Farmers	3.180	1.981	7.9	.0060*
Father Occup	. Skilled	4.454	1.945		
	Farmers	3.500	1.779		
	Quarry	2.828	1.902		
	Unskilled	2.571	1.902	3.7	.0145*
Income	Adequate	6.000	.000		
	Inadequate	3.281	1.991	5.7	.0195*

^{*} p = <.05

Male children who contributed more resources than other children had a higher mean score (4.750) than female children who contributed more resources than other children (2.478). This null hypothesis was rejected.

<u>Ho-18</u>. There are no differences in child nutritional status according to participation in decision making.

A significant difference was evident in the univariate analysis of variance test results for child nutritional status by mothers' participation in decision making (F = 5.486, df = 1, 70; p = .0220, see Table 25). Children of mothers who participated in decision making had higher mean scores (4.333) than children of mothers who did not participate in decision making (3.017). This null hypothesis was rejected.

<u>Ho-19</u>. There are no differences in child nutritional status according to decision making autonomy.

A significant difference was evident in the univariate analysis of variance test result by decision making autonomy (F = 5.167, df = 1, 70; p = .0261, see Table 25). Children of mothers who made decisions autonomously had a higher mean score (4.666) than children of mothers who did not make decisions autonomously (3.095). This null hypothesis was rejected. However, there were no significant differences in child nutritional status by mothers' decision implementation, decision making dominance, and cooperative decision making structure. In addition, there were no significant differences in child nutritional status by all fathers' decision making inputs (participation, implementation, autonomy, dominance, and cooperation) in all households.

Table 24

ANOVA Results for Child Nutritional Status by Child-related
Factors

Factor	Level	Mean	SD	F	P
Gender	Male	4.50	2.12		
	Female	2.12	1.12	5.39	.0487*
Morbidity	Not ill	3.63	2.01		
	111	2.54	1.71	4.89	.0300*
Caregiver	Mother	3.21	1.99		
	Other	4.85	1.67	4.45	.0382*
Meal mgr	Mother	3.26	1.99		
	Other	5.66	0.57	4.27	.0421*
Resources	Male	4.75	1.50		
	Female	2.47	1.70	6.23	.0195*

^{*} p < .05

Research Question 15. Does child nutritional status depend on intrahousehold variables? This question is answered by testing hypotheses twenty through thirty seven.

<u>Ho-20</u>. There is no relationship between child nutritional status and family size.

Stepwise regression results for the prediction of child nutritional status showed that there was no significant

Table 25

ANOVA Results for Child Nutritional Status by Decision

Making Inputs

Factor	Level	Mean	SD	F	P
					
Decides	Mothers	4.333	1.988		
	Others	3.017	1.922	5.486	.0220*
Autonomy	Mothers	4.666	1.658		
	Others	3.095	1.973	5.167	.0261*
Implement	Mothers	3.750	2.179		
	Others	3.200	1.964	0.756	.3874
Dominance	Mothers	3.833	2.483		
	Others	3.349	1.944	2.306	.1073
Cooperate	Mothers	3.500	3.535		
	Others	3.285	1.979	0.022	.8822

^{*} p < .05

relationship between child nutritional status and family size (F = .492, df = 5, 62; p = .780, see Table 26). This null hypothesis was retained.

<u>Ho-21</u>. There is no relationship between child nutritional status and family developmental stage.

Stepwise regression results for the prediction of child nutritional status showed that there was no significant

relationship between child nutritional status and family developmental stage (F = .512, df = 9, 51; p = .858, see Table 26). This null hypothesis was retained.

Table 26
Stepwise Regression Results for the Prediction of Child
Nutritional Status by Family Variables

Predictor	В	SE B	Beta	T	sig T
Family size	122	.207	154	591	.636
Fam Dev Stage	.863	.590	.212	1.462	.149

<u>Ho-22</u>. There is no relationship between child nutritional status and mothers' levels of education.

The stepwise regression results indicated that there was a significant relationship between child nutritional status and mother's levels of education, ($[R^2 = .275]$ F = 8.725, df = 1, 23; p = .007, see Table 27). Mothers' level of education explained 27.5 % of the variance in child nutritional status. The null hypothesis was rejected.

Ho-23. There is no relationship between child nutritional status and fathers' occupational levels.

The stepwise regression results indicated that there was a significant relationship between child nutritional

status and fathers' occupations ([R^2 = .128] F = 9.11, df = 1, 62; p = .003, see Table 27). Fathers' occupations accounted for 12.8% of the variance in child nutritional status. This null hypothesis was rejected.

Ho-24. There is no relationship between child nutritional status and family socio-economic status.

Stepwise regression results revealed that there was a significant relationship between the means of child nutritional status and the aggregated family socio-economic status variables $[R^2 = .243]$ F = 2.167, df = 8,54; p = .0447). This null hypothesis was rejected. Family socio-economic status variables combined accounted for 24.3 percent of the variance in child nutritional status score. However, when the socio-economic status variables were disaggregated for the stepwise regression analysis, the selected individual components were not significant (see Table 27).

<u>Ho-25</u>. There is no significant relationship between child nutritional status and mothers' time allocation.

Stepwise regression results for the prediction of nutritional status showed that mothers' subsistence production time was significantly related to child nutritional status (F = 4.279, df = 1, 80; p = .041); time spent on farm work alone was also significantly related to child nutritional status (F = 7.46, df = 1, 80; p = .007); and mothers' total time spent on all activities on a daily

Table 27
Stepwise Regression Results for the Prediction of Child
Nutritional Status by SES Indicators

Predictor B	SE B	Beta	т	Sig T
Father Educ649	.700	.121	0.92	.357
Mother Educ 2.56	1.206	.524	2.95	.007*
Father Occup 1.57	.521	.357	3.01	.003*
Mother Occup .810	.496	.200	1.63	.107
Father \$ Adeq .506	.486	.126	1.04	.301
Mother \$ Adeq .256	.493	.064	.521	.604
Income** .412	.746	.101	.552	.583
Food Budget391	.825	071	474	.637

^{**} Fathers' monthly contribution to family income.

basis was significantly related to child nutritional status $(F = 2.23, df = 7, 74; p = .040, see Table 28 for other relevant values). Mothers' time allocation accounted for <math>17.4 \% [R^2 = .174]$ of the variance in child nutritional status. This null hypothesis was rejected.

Ho-26. There is no relationship between child nutritional status and fathers' time allocation.

Stepwise regression results for the prediction of child

^{*} p < .05.

nutritional status showed that fathers' time allocation for household production, subsistence production, and market economy production was not significantly related to child nutritional status (F = 1.591, df = 3, 78; p = .198, see Table 28 for additional relevant values). This null hypothesis was retained.

<u>Ho-27</u>. There is no relationship between child nutritional status and mothers' resource (income and food) allocation influence.

Stepwise regression results shown on Table 28 revealed that there was no significant relationship between child nutritional status and mothers' resource allocation influence (F = .092, df = 2, 67; p = .912). This null hypothesis was retained.

<u>Ho-28</u>. There is no relationship between child nutritional status and fathers' resource (income and food) allocation influence.

Stepwise regression results shown on Table 28 indicated that there was no significant relationship between child nutritional status and fathers' resource allocation influence (F = .425, df = 2, 68; p = .654). This null hypothesis was retained.

<u>Ho-29</u>. There is no relationship between child nutritional status and mothers' participation in decision making. Stepwise regression results shown on Table 29 revealed that there was a significant relationship

Table 28

Stepwise Regression Results for the Prediction of Child

Nutritional Status by Resource Allocation

Predictor	В	SE B	Beta	T	Sig T
Mother SPT**	206	.099	225	-2.060	.041*
Father SPT	012	.080	-1.174	150	.880
Mother Farm	306	.112	292	-2.730	.007*
Father Farm	050	.116	057	446	.657
Mother MET**	.137	.114	.136	1.196	.235
Father MET	.183	.110	.182	1.656	.101
Mother HPT**	019	.121	034	269	.788
Father HPT	154	.119	150	-1.292	.198
Income alloca	tion infl	uence			
Mothers	.216	.545	.048	.398	.692
Fathers	.255	.704	.043	.363	.717
Food allocati	on influe	nce			
Mothers	295	1.456	024	203	.839
Fathers	.415	.506	.090	.820	.415

^{*} p < .05

^{**} SPT = Subsistence Production Time, HPT = Household Production Time, and MET = Market Economy Time.

between child nutritional status and mothers' participation in decision making ([R^2 =.0712] F = 4.988, df = 1, 65; p = .029). Mothers' participation in decision making accounted for 7.12% of the variance in child nutritional status. This null hypothesis was rejected.

<u>Ho-30</u>. There is no relationship between child nutritional status and fathers' participation in decision making.

Stepwise regression results shown on Table 29 indicated that there was no significant relationship between child nutritional status and fathers' participation in decision making (F = .490, df = 4, 62; p = .742). This null hypothesis was retained.

<u>Ho-31</u>. There is no relationship between child nutritional status and mothers' decision making autonomy.

Stepwise regression results showed that there was a significant relationship between child nutritional status and mothers' decision making autonomy ([$R^2 = .0599$] F = 4.144, df = 1, 65; p = .0458, see Table 29). Mothers' decision making autonomy accounted for 5.99% of the variance in child nutritional status. This null hypothesis was rejected.

<u>Ho-32</u>. There is no relationship between child nutritional status and fathers' decision making autonomy.

Stepwise regression results revealed that there was no significant relationship between child nutritional status

and fathers' decision making autonomy (F = .576, df = 1, 65; p = .810, see Table 29). This null hypothesis was retained.

<u>Ho-33</u>. There is no relationship between child nutritional status and cooperative decision making structure.

Stepwise regression results shown on Table 29 showed that there was no significant relationship between child nutritional status and cooperative decision making structure (F = .201, df = 2, 65; p = .817). This null hypothesis was retained.

<u>Ho-34</u>. There is no relationship between child nutritional status and type of cooking facility used in the household.

Regression results shown on Table 30 indicated that there was a significant relationship between child nutritional status and the availability of multiple cooking facilities in the household ($[R^2 = .135]$ F = 4.242, df = 1, 27; p = .0492). The availability of multiple cooking facilities accounted for 13.5% of the variance in child nutritional status. This null hypothesis was rejected.

<u>Ho-35</u>. There is no relationship between child nutritional status and child food variety.

Regression results showed that there was a significant relationship between child nutritional status and diversified diets for children ($[R^2 = .156]$ F = 8.898, df = 1, 48; p = .0045, see Table 30). Child food variety

Table 29

Stepwise Regression Results for the Prediction of Child

Nutritional Status by Decision Making Inputs

Predictor	В	SE B	Beta	Т	Sig T
Dec.Mkg-M	1.289	.577	.266	2.230	.0290*
Dec.Mkg-F	1.516	2.151	.236	0.705	.484
Autonomy-M	1.483	.728	.244	2.036	.0458*
Autonomy-F	0.222	.926	.029	0.240	.810
Coop-M	0.296	1.438	.025	0.206	.837
Coop-F -	-1.203	2.018	074	596	.553

^{*} p = < .05 M = Mothers, F = Fathers

accounted for 15.6% of the variance in child nutritional status. This null hypothesis was rejected.

<u>Ho-36</u>. There is no relationship between child nutritional status and food allocation strategy applied to children.

Regression results showed that there was a significant relationship between child nutritional status and food allocation strategy that was based on a child's need ([R^2 = .293] F = 6.369, df = 3, 46; p = .0011, see Table 30). A need based food allocation strategy accounted for 29.3% of the variance in child nutritional status. This null

hypothesis was rejected.

Ho-37. There is no relationship between child nutritional status and child's sex and age.

Stepwise regression results revealed that there was no significant relationship in this hypothesis (F = 1.537, df = 7, 39; p = .1835). This null hypothesis was retained. However the combined children's variables accounted for 21.6 percent of the variance in child nutritional status. Pearson Product-Moment correlations showed that child nutritional status is related to child's health condition and child's contribution to household resources (see Table 31 for relevant details).

Table 30

Regression Results for the Prediction of Child Nutritional

Status by Food-related Variables

Predictor	В	SE B	Beta	Т	Sig T
Cooker type	-1.504	.730	368	-2.060	.0492*
Food variety	1.059	.355	.395	2.983	.0045*
Food allocati	on strated	ay:			
All children	.683	.281	.311	2.428	.0191*
Preschoolers	1.826	.791	.323	2.308	.0256*

^{*} p < .05

Table 31
Children's Predictor Variables for Nutritional Status

Predictor	В	SE B	Beta	Т	Sig T
Sex	589	.599	152	984	.331
Age	906	.612	227	-1.480	.146
Child's hea	lth		.252		.030*
Resource contribution		.446		.019*	

^{*} p < .05

Research Question 16. Which variables (socio-economic status, decision making, time, income, food, or allocation patterns) contribute most to child nutritional status? For each variable, does it make a difference which family member contributed it?

Relationships among the intrahousehold variables and children's nutritional status were assessed first with correlational techniques i.e. Pearson Product Moment tests and then regression analyses. The first technique is designed to determine the relationship that exists between two variables. The range for interpretation of values utilized to analyze the results obtained was:

.80 to .99, very strong positive correlation;

.60 to .79, strong, positive correlation;

- .40 to .59, moderately strong, positive correlation;
- .20 to .39, weak, positive correlation;
- .01 to .19, very weak, positive correlation

 (presentation by Dr. Stephen Raudenbush, instructor, CEP

 905: Advanced Statistics, MSU, Winter, 1990).

Given that there were relationships, regression analysis then provided the mechanism to determine what combination of intrahousehold variables predicted the variation in the children's nutritional status. The values for the Pearson Product Moment tests are presented in Table 32 and those of the regression analyses in Table 33. Only those correlates and predictors that are significant are shown.

As reported in Table 32, all the correlations between child nutritional status and the selected variables were significant but weak (r=.25 to r=.35, p=<.05) except child's contribution to household resources which was significant and moderately strong (r=.44, p=<.05). It is important to note also that mothers' time for farm work was the only significant negative correlate (r=-.29, p=<.05) indicating that the more hours a mothers spent on unpaid farm work the lower the child nutritional status was. Hours spent on unpaid farm work operated as a mean shifter when treated as a factor in the analysis of variance test on child nutritional status. More hours of farm work shifted the means downward and less hours shifted them upward.

Table 32

Pearson Product Moment Correlations Between Intrahousehold

Variables and Child Nutritional Status

Variables	Correlations (r)	<u>p</u>
Fathers' occupations	.3515	.002*
Family financial adequacy >	.2710	.020*
Mothers' education level	.2292	.044*
Mothers' occupations /	.3123	.006*
Mothers' farm time	2921	.022*
Mothers' decision participation	n .2696	.022*
Mothers' decision autonomy	.2622	.026*
Child health condition /	.2524	.030*
Child's resource contribution	.4468	.019*

^{*} correlations significant at p < .05.

As reported on Table 33, when fathers' occupations shifted from unskilled to skilled levels, child nutritional status increased by .357 (35.7%). When mothers' educational levels shifted from no schooling or primary school level to secondary and post-secondary, child nutritional status increased by .524 (52.4%). Increased decision making participation by mothers, increased child nutritional status score by .266 (26.6%). An increase in mothers' decision

Table 33

Predictor Variables Regressed on Child Nutritional Status

Predictor Beta Sig T R ² Fathers' occupations / .357 .003* .12 Mothers' education / .524 .007* .27 Mothers' participation .266 .029* .07 in decision making / .244 .045* .05 making autonomy / .292 .008* .17	
Mothers' education / .524 .007* .27 Mothers' participation .266 .029* .07 in decision making / .045* .05 making autonomy /	Notation
Mothers' participation .266 .029* .07 in decision making \(\sigma \) Mothers' decision .244 .045* .05 making autonomy \(\sigma \)	8 X ₁
in decision making Mothers' decision .244 .045* .05 making autonomy	5 X ₂
making autonomy ~	1 X ₃
Mothers' farm time292 .008* .17	9 X ₄
	4 X ₅
Cooking facility .368 .049* .13	5 X ₆
Food variety395 .004* .15	6 X ₇
Food allocation .323 .025* .29 strategy	3 X ₈

^{*} significant at p < .05 level

making autonomy, increased child nutritional status score by .244 (24.4%). When mothers' time for unpaid farm work increased by 1 hour, child nutritional status <u>decreased</u> by .292 (29.2%). A shift in the type of cooking facility

 X_1 0 = unskilled occupations, 1 = skilled occupations;

 X_2 0 = 0-8 years, 1 = 9-12 years;

 X_3 , X_4 , & X_5 are interval level data;

 X_6 0 = single woodfire burner, 1 = multiple cooking facilities;

 X_7 0 = food monotony, 1 = food variety;

 X_8 0 =non-need based allocation, 1 = need based allocation.

available in the household from a single traditional woodfire burner to multiple fuel burners, increased nutritional status score by .368 (36.8%). Household's ability to provide diversified diets to children from a monotonous carbohydrate based diet to a variety of different foods increased nutritional status score by .395 (39.5%).

When food allocation strategy administered to children changed from a non-need based strategy to a child's need based strategy, nutritional status increased by .323

The amount of variance explained in child nutritional

atus in rank order from the highest to the lowest was:

- Food allocation strategy based on child's need, 29.3% $([R^2 = .293] F = 6.369, df = 3, 46; p = < .05).$
- Mothers' education, 27.5% ([R² =.275] F = 8.725, df =1,
 23; p = < .05).</pre>
- Socio-economic status variables aggregated, 24.3%, ([R² = .243] F = 2.167, df = 8, 54; p = < .05)
- Mothers' time allocation, 17.4%, ([$R^2 = .174$] F= 2.236, df = 7, 74; p = < .05).
- Child's food variety, 15.6%, ([$R^2 = .156$] F = 6.369, df = 3, 46; p = < .05).
- Multiple cooking facilities, 13.5%, ([$R^2 = .135$] F = 8.898, df = 1, 48; p = < .05).
- Fathers' occupations, 12.8%, ([R² = .128] F= 9.110, df = 1, 62; p = < .05).

- 8. Mothers' participation in decision making activities, 7.12%, ([$R^2 = .0712$] F = 4.988, df = 1, 65; p = < .05).
- 9. Mothers' decision making autonomy was 5.99% ([R² = .0599] F = 4.144, df = 1, 65; p = < .05).

education, their participation in decision making, their ability to make decisions autonomously, their time allocation, their ability to vary children's diets, and their food allocation strategies were important contributors child nutritional status. For fathers, occupation was

The common preference or neoclassical model of

Qusehold resource allocation postulates that all resources

e pooled and a dictator determines the allocation, or that

household members have the same preferences (Becker,

64). If resources are pooled and then allocated to

minize children's welfare, then resources under the

ontrol of fathers and mothers should have the same impact

demand. With survey data on child nutritional status in

ral Kenya, the equality of parental resource influence is

jected. Mothers with higher levels of education accounted

r a higher positive contribution to their children's

tritional status than fathers with the equivalent

cupational levels. Similarly, mothers with higher

cupational levels accounted for higher child nutritional

atus scores than fathers with the equivalent occupational

levels. There was also evidence for decision making power:

decision making autonomy and decision making dominance by

mothers accounted for a higher positive contribution to

child nutritional status than decision making autonomy and

dominance by fathers. There was also evidence for time

allocation: mothers' time allocation for farm work and/or

unpaid subsistence production accounted for a higher

negative contribution to child nutritional status than

fathers' time allocation for the same activities. There is

cidence, therefore, that resources contributed by mothers

ad more impact on children's nutritional status than

Summary of Hypothesis Testing

Of the 37 null hypotheses generated for this study 24

The rejected and 13 were retained (see Table 32 for a

Thinmary of the results reported).

The focus of the first seven hypotheses was the solution saible differences in intrahousehold resource variables tween fathers and mothers. The result of paired T-tests vealed that there were significant differences between there and mothers on all variables except decision making minance, perception of cooperative decision making and cision implementation. The results of the analysis of riance tests indicated significant differences in child

Table 34

Summary of Hypothesis Testing Results

Hypothesis	Test	Reject/Retain
1. There is no difference in the allocation of time for household, subsistence, and paid work between fathers and mothers.	T-Test	x .
2. There is no difference in perception of participation in esource and task allocation between there and mothers.	T-Test	z X
There is no difference in cision making autonomy between thers and mothers.	T-Test	t X
There is no difference in decision king dominance between fathers and thers.	T-Test	t X
There is no difference in ception of cooperative decision in between fathers and mothers.	T-Test	z X
There is no difference in ticipation in decision making tween fathers and mothers.	T_Test	z X
There is no difference in cision implementation between thers and mothers.	T_Test	z X
There is no difference in child tritional status (CNS) by mothers' vels of education.	ANOVA	x
There is no difference in CNS by thers' levels of education.	ANOVA	x
. There is no difference in CNS by thers' occupations.	ANOVA	x

Table 34 (cont'd)

Hypothesis	Test	Reject/Retain
11. There is no difference in CNS by fathers' occupations.	ANOVA	х
12. There is no difference in CNS by perception of family financial adequacy.	ANOVA	х
13. There is no difference in CNS by child gender preference.	ANOVA	x
14. There is no difference in CNS by child's health condition.	ANOVA	x
15. There is no difference in CNS by child health care-giver.	ANOVA	x
There is no difference in CNS by Child meal manager.	ANOVA	x
There is no difference in CNS by ild's contribution to household sources.	ANOVA	х
There is no difference in CNS by thers' participation in decision king.	ANOVA	х
There is no difference in CNS by thers' decision making autonomy.	ANOVA	x
There is no relationship between some sand family size.	REGRESSI	ON X
There is no relationship between stage.	REGRESSI	ON X
There is no relationship between s and mothers' levels of education.	REGRESSI	ON X
There is no relationship between S and fathers' occupational levels.	REGRESSI	ON X
> .	REGRESSI	ON X
>	REGRESSI	ON X

Table 34 (cont'd)

Hypothesis	Test Reje	ct/Retain
26. There is no relationship between CNS and fathers' time allocation.	REGRESSION	Х
27. There is no relationship between CNS and mothers' resource allocation influence.	REGRESSION	х
28. There is no relationship between CNS and fathers' resource allocation influence.	REGRESSION	х
29. There is no relationship between CNS and mothers' participation in decision making.	REGRESSION	X
3 O. There is no relationship between CNS and fathers' participation in Cision making.	REGRESSION	х
There is no relationship between comes and mothers' decision making tonomy.	REGRESSION	x
There is no relationship between s and fathers' decision making tonomy.	REGRESSION	x
There is no relationship between s and cooperative decision making ructure.	REGRESSION	x
There is no relationship between s and type of cooking facility ailable in the household.		x
There is no relationship between s and child's food variety.		x
There is no relationship between s and food allocation strategy.		x
There is no relationship between S and child-related variables ender and age).	REGRESSION	x

nutritional status by all variables except fathers' levels of education and decision making inputs.

The results of stepwise regression analysis tests
disclosed that there were significant relationships between
child nutritional status and family socio-economic status,
mothers' time allocation, mothers' participation in decision
making, mothers' decision making autonomy, multiple cooking
facilities available in the household, child food variety,
and food allocation strategy based on child's need. On the
ther hand the results showed that fathers' variables of
articipation in decision making, decision making autonomy,
ime allocation, income allocation influence, and food
location influence did not have any significant
lationships with child nutritional status.

CHAPTER V

DISCUSSION AND CONCLUSIONS

The purpose of this study was to investigate whether intrahousehold resource allocation and decision making patterns relate to child nutritional status. Hypotheses were generated that reflected the differences between fathers' and mothers' variables, the differences in child nutritional status according to intrahousehold variables, and the relationships between child nutritional status and intrahousehold variables. Results were based upon tests of tagathered from October 1992 to January 1993 from a mple of 283 people from 101 rural households with 3-6 year defildren in Central Kenya.

Discussion of Results for the Study Variables

Discussion of the results is presented in this section ich summarizes the findings of the eight objectives of the udy specified in the introductory chapter.

Objective number 1: Assess children's nutritional atus and health condition.

Children's nutritional status scores ranged from 1.00

percent of the children were considered severely malnourished in that they were classified as stunted, wasted, and currently underfed. Twenty-seven percent were considered moderately malnourished in that they were either wasted or currently underfed, but did not exhibit signs of past malnutrition (stunting). Ten percent were currently moderately normal but were stunted in the past. About twenty five percent were considered normal by all three parameters used to assess nutritional status in that they were not stunted, or wasted, and they were currently normal.

The children in the sample ranged in age from 32 months to 92 months and were almost equal in number of boys and girls. Analysis of variance test results revealed no significant differences due to age or sex (p = < .05).

However, comparison between 3, 4, and 5 year old children showed that there was a progressive degree of stunting and wasting with the 3 year old children, stunting being more prevalent than wasting. The mean score for 3-year old children was 3.0345, for 4-year olds, 3.4074, and for 5 to 6-year olds, 3.846. Age differences have been found by other investigators (Oomen, Jansen & T'Mannetje, 1979), however no realistic comparisons could be made due to the wide variation in methodology, instrumentation, and sample size. These researchers found no significant differences based on sex. In the current study, on the average, the

girls scored 3.6154 and the boys 3.2326. All children were immunized against tuberculosis, diphtheria, tetanus, poliomyelitis, whooping cough, and measles. Mortality for under fives was relatively low in the study sample (60/1000) compared to the 113 per 1000 live-births officially quoted for Kenya (UNICEF, 1990).

Objective number 2. Investigate the differences between fathers' and mothers' inputs in various areas of decision making.

The paired T-Test results performed on mean scores for decision making inputs. In relation to decision making, mothers reported participating in decision making pertaining to all 16 specified family tasks and fathers reported participating in 8 out of the total 16 family tasks.

Mothers were more dominant in service oriented decisions Pertaining to household maintenance and child care. Fathers were not dominant in any of the 16 specified tasks.

Mothers' exhibited more decision making autonomy in more tasks than did fathers. Mothers reported more cooperative decision making than did the fathers. A significant difference in decision making autonomy between fathers and mothers was evident (Table 22).

Significant mean differences in decision making

autonomy were found ranging from 0.00 to .1184 with a

difference of .1184. Similarly significant mean differences

were found in participation in decision making activities

ranging from .0921 to .2237 with a difference of .1316.

For cooperative decision making in which there was no
significant difference, the means ranged from .0132 to .0395

with a difference of .0263. There was no significant
difference in decision making dominance between fathers and
mothers. The mean difference ranged from .00 to .0658 with
a difference of .0658. Finally a nonsignificant finding was
evident in decision implementation between fathers and
mothers. The mean difference ranged from .1184 to .1579

with a difference of .0395. In support of these findings,
Rogers (1990) suggested that genuine differences of opinion
are likely to exist among household members as to who makes
what decisions. Secondly, people may not report the actual
influence they exercise in decision making activities.

Objective number 3. Investigate the differences

between fathers' and mothers' time allocation for child

care, household production, subsistence production, and

market economy production.

Findings related to this objective were obtained from

Paired T-Test results performed on mean scores for time

allocation variables. There were significant differences in

time allocation between fathers and mothers in all

activities. Fathers spent significantly more time on market

economy production and animal care than mothers. Mothers

spent more time on household and subsistence production than

fathers (Table 20). The range of mean differences in time allocation pairs of means was 4.722 for household production time to -3.257 for market economy production time between mothers and fathers. These results were compatible with other findings on time studies in the United States (McCullough, 1980; Walker & Woods, 1976), therefore, these results may indicate a universal rather than a cultural tendency.

Objective number 4. Investigate the differences between fathers' and mothers' perception of financial adequacy and intrahousehold resource (income and food) allocation influence.

Paired T-Test results performed on mean scores for

Perception related variables. There were significant

differences in the perception of financial adequacy, and

Participation in money and food allocation between fathers

and mothers. Fathers had lower ratings on perception of

financial adequacy than mothers. Fathers had significantly

more influence on income allocation than mothers, while

mothers had significantly more participation in food

allocation than fathers (Table 21). The range of difference

for income allocation between mothers and fathers was

-1.090. The researcher posited that a person's income

earning capacity related to the extent of his or her income

allocation influence. All fathers reported that they were

earning incomes and only 16 percent of the mothers reported earning wages. In relation to income allocation influence, fathers reported more influence than mothers. In support of this finding, Engle (1990) reported that women have greater control or influence over the income which they earn than that earned by their husbands. The mean difference for food allocation influence between fathers and mothers was 1.657. Mothers reported more influence in food allocation than fathers. In support of this finding, Rogers (1990) indicated that women make decisions which pertain to their own spheres of activity. Activities concerned with food and its distribution were the prerogative of women in the study sample.

Objective number 5. Investigate the differences between fathers' and mothers' perceived participation in household and farm task allocation.

Findings related to this objective were obtained from paired T-Tests performed on perceived participation in household and farm task allocation. There were significant differences in perceived participation in household and farm task allocation between fathers and mothers. Mothers had significantly more participation in both household and farm task allocation than fathers (Table 21).

Objective number 6. Determine whether child nutritional status varies according to socio-economic status, decision making inputs, and child related factors.

Findings related to this objective were obtained from tests of hypotheses concerned with differences in child nutritional status by intrahousehold resource factors. theme in hypotheses eight through nineteen was to investigate the differences in child nutritional status according to socio-economic status, decision making inputs, and child-related factors. All but one hypothesis were rejected at the p < .05 level of significance. Significant differences were evident in child nutritional status with mothers' levels of education. The mean score for children of mothers with no schooling experience or primary school education less than 8 years was 3.217 and children of mothers with secondary and post secondary training was 4.666 (Table 23). In contrast, fathers' levels of education did not produce any significant differences in child nutritional status. The mean score for children of illiterate and primary school level fathers was 3.312 and that of secondary and post secondary trained fathers was 3.583. In support of this finding, Hoorweg & Niemiejer (1983) investigated the influence of living conditions on child nutritional status in Murang'a District of Central Kenya. They found that mothers' formal education had a positive influence on nutrition knowledge. Mothers with secondary education were aware of the general principles of child nutrition.

The ANOVA results in child nutritional status by parents' occupations were significant (Table 23). The mean

score for children of subsistence farming mothers was 3.180 and for wage earning mothers was 6.000. The mean score for subsistence farming fathers was 3.500, quarry workers 2.828, unskilled workers 2.571, and skilled workers 4.454. indicated that in general both parents' occupations (a proxy for income earning capacity) contributed significantly to the var iance in child nutritional status. The highest mean score attained was by children whose mothers were earning incomes, followed by children whose fathers were employed as skilled workers. Similarly significant mean scores for children whose fathers felt that their incomes were adequate was higher (6.000) compared to children whose fathers felt that their incomes were inadequate (3.281). In support of this finding, Kumar (1978) found that in households where mothers worked for wages in India, their incomes were more highly correlated with their children's nutritional status than were total household income or fathers' incomes.

Significant differences were evident in nutritional status by child gender preference (Table 24). Children of parents who reported that their sons or daughters were treated differently in food allocation showed significantly different mean scores between boys (4.500) and girls (2.125). Sons who contributed more resources to the household had significantly higher mean scores (4.750) than daughters who contributed an equivalent amount of resources to the household (2.478). In support of these results,

Safilios-Rothschild (1990) posited that gender is a key distributional criterion in poor households in which food is scarce. Alternatively, in well-to-do households male and female members of all ages tend to have a greater probability of equal access to resources than in poor households.

Significant differences were evident in nutritional status by child morbidity (Table 24). Children who had been hospitalized within the month prior to the interview had significantly lower mean scores (2.545) compared to children who had not been hospitalized (3.634). The relationship between nutrition and disease is well established (Robinson & Lawler, 1977).

nutritional status by decision making patterns (Table 25).

Mean scores for children of mothers who participated in family decision making activities were significantly higher (4.333) than children of mothers who did not participate in family decision making activities (3.017). Similarly, children of mothers who exercised decisions autonomously had significantly higher means scores (4.666) than children of mothers who did not exercise decisions autonomously (3.095). In contrast, there were no significant differences evident in child nutritional status by fathers' decision making patterns. Mean scores for children of fathers who participated in family decision making activities were 3.571

compared to 3.333 for children of fathers who did not participate in decision making activities.

Objective number 7. Determine whether intrahousehold resource variables such as family size, family developmental stage, socio-economic status, decision making, time, money, food, and allocation patterns predict child nutritional status.

Findings related to this objective were obtained from tests of hypotheses concerned with relationships between child nutritional status and intrahousehold resource predictors (hypotheses twenty through thirty seven). Significant relationships were evident between child nutritional status and family socio-economic status, fathers' occupations, mothers' time allocation, mothers' participation in decision making activities, type of cooking facility available in the household, child food variety, and strategy used to allocate food to children. However no significant relationships were evident between child nutritional status and family size, family developmental stage, fathers' education, fathers' time allocation, both fathers' and mothers' resource allocation influence, fathers' participation in decision making, fathers' decision making autonomy, and cooperative decision making structure (Tables 26, 27, 28, 29, & 30).

Objective number 8. Determine whether child related Variables such as gender, age, morbidity or health condition, and child's contribution to household resources predict child nutritional status.

No significant relationships were evident between child nutritional status and children's variables of gender, and age, (Table 31). However significant correlations were found between nutritional status and child health, and child's contribution to household resources.

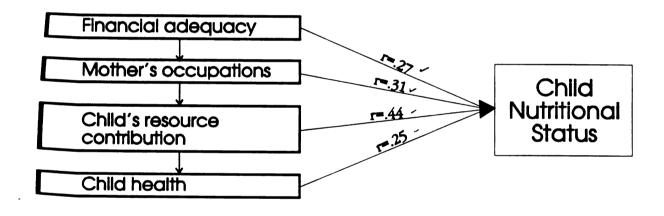
Conclusions

About a fifth (19.8%) of the children were considered severely malnourished, about a quarter (26.8%) were classified as moderately malnourished, and slightly more than a third (34.7%) were categorized as normal as assessed by nutritional anthropometry using the World Health Organization (WHO) classification system based on the US National Center for Health Statistics (NCHS) reference Population. This sample of children suffered from both chronic and acute malnutrition. The children's exposure to the 1991-1992 drought possibly accounted for the high Prevalence of malnutrition, although this hypothesis would need to be verified by a longitudinal study through pre and Post drought testing.

The major focus of this study was an analysis of the lationship between intrahousehold resource allocation, decision making, and child nutritional status. The first

purpose was to test the differences in intrahousehold resource allocation and decision making inputs between fathers and mothers. To accomplish this, paired T-tests were performed on mean scores for all variables. Significant differences were evident in time allocation, perception of participation in decision making, income allocation, food allocation, and task allocation between fathers and mothers. The second purpose was to test the ability of intrahousehold resource allocation and decision making to predict child nutritional status. To accomplish this, stepwise regression analyses were utilized to determine what combination of intrahousehold resource Variables predicted the variation in child nutritional status. Significant relationships were evident between **Children's** nutritional status and fathers' occupations and Perceptions of family financial adequacy, mothers' levels of education and occupations, mothers' time allocation, mothers' participation in decision making, mothers' decision making autonomy, male gender preference, child's Contribution to household resources, child's health Condition, availability of multiple cooking facilities in the household, child food variety, and a need based food allocation strategy applied to children. Three conceptual models summarizing the significant correlates and predictors child nutritional status are depicted in Figures 2, 3, and 4.

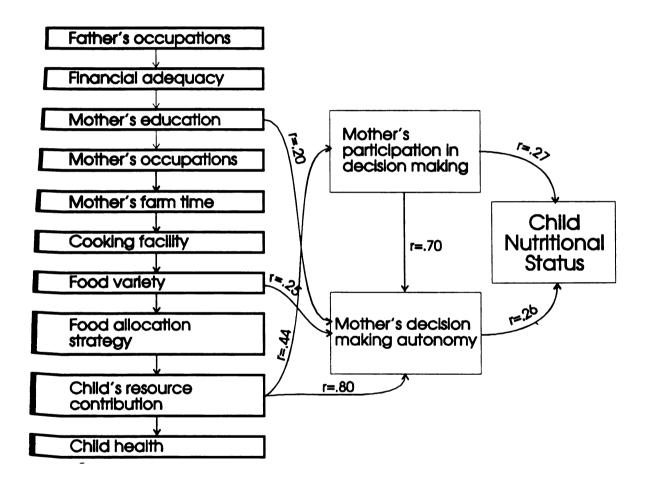
HOUSEHOLD INPUTS ──── OUTPUT



coefficients are significant at .05 level.

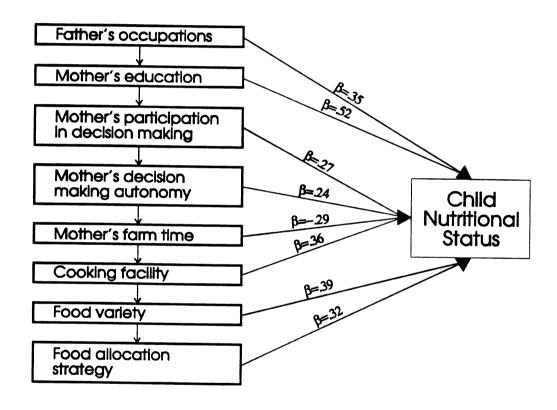
2. 2. A conceptual model of the major correlates of child tritional status.

HOUSEHOLD INPUTS ——>THROUGHPUTS ——>OUTPUT



3. A conceptual model of the major correlates of child utritional status utilizing throughput variables.

HOUSEHOLD INPUTS ──── OUTPUT



coefficients are significant at .05 level.

4. A conceptual model of the major predictors of child intritional status.

There were no significant relationships between child nutritional status and fathers' levels of education, fathers' time allocation, fathers' income and food allocation influence, fathers' participation in decision making activities, fathers' decision making autonomy, cooperative decision making structure, mothers' income and food allocation influence, family size, family developmental stage, and child's gender and age. There were indications, however, that these predictors should continue to be considered because there were some differences, although they were not statistically significant at .05 level.

The third purpose was to test the differences in child nutritional status according to intrahousehold resource allocation and decision making variables. To accomplish this, analysis of variance (ANOVA) was utilized to determine the differences among two or more sample means. Significant differences were evident in child nutritional status according to mothers' levels of education, mothers' occupations, fathers' occupations, perception of family financial adequacy, mothers' participation in decision making activities, mothers' decision making autonomy, child sender preference, child's health condition, child's health care-giver, child's meal manager, and child's contribution household resources. However, there were no significant differences evident in child nutritional status by fathers' levels of education, fathers' participation in decision

making activities, or fathers' decision making autonomy.

Some family contexts can be depicted as being more relevant in maximizing children's nutritional status than others. This section elaborates 12 contexts that were identified as important in the study. These include socioeconomic status, decision making inputs, time allocation, cooking facilities available in the household, food variety, food allocation strategies, child's health condition, and child gender preference.

of the socio-economic variables, perception of family financial adequacy was the most predominant contributor to child nutritional status. Children of fathers who felt that their incomes were adequate had higher mean scores than children of fathers who felt that their incomes were not adequate. Mothers' levels of education were the second highest contributors to child nutritional status; the more Years of education mothers had, the higher the mean scores of their children. Mothers' occupations were the third contributors; children of mothers who were earning wages had higher mean scores than children of mothers who were unpaid subsistence farmers. Fathers' occupations were the fourth contributors; the more highly skilled the fathers were, the higher the mean scores of their children.

Of the decision making inputs, mothers' participation decision making was the greatest contributor to child tritional status. Children of mothers who participated in

decision making activities had higher mean scores than children of mothers who did not participate in decision making activities. Similarly, children of mothers who made decisions autonomously had higher mean scores than children of those who did not. Fathers' decision making inputs had no significant relationships with child nutritional status.

Of the time allocation variables, mothers' time for farm work was a negative contributor to child's nutritional status. The more time a mother spent on subsistence activities, the lower the child's nutritional status. On the other hand, children of mothers who were engaged in market economy production (wage earning employment) and spent less time on unpaid subsistence production had higher nutritional status scores. Fathers' farm time allocation had no significant relationship to child nutritional status.

Of the cooking facilities available in the household,

the availability and use of multiple cooking facilities

(several burners) was related to higher child nutritional

status. On the other hand, the exclusive use of the

traditional woodfire (single burner) alone was a negative

ontributor to child nutritional status.

Of the food intake variables, food variety was the most Predominant positive contributor to child nutritional status. The more varied and well-balanced the diet was, the ligher the nutritional status score, while the more protonous carbohydrate based the diet was, the lower the

child nutritional status.

Of the food allocation strategies applied to children, the administration of a child need based strategy was the most important positive contributor to child nutritional status. Children of parents who applied the need based strategy in allocating food to them had higher mean scores than children who were allocated food on a non-need based strategy such as equal portions, sharing from a common plate, according to sex, age, food availability, or child's contribution to household resources.

Of the children's variables, child's health condition was a positive contributor to nutritional status. Children who were in good health, and had not been hospitalized within the month prior to the interview had higher mean scores than children who were not in good health, and had been hospitalized within the same period.

Of the child gender preference variables, male children of parents who reported differential preferences with respect to food allocation to sons relative to daughters had higher mean scores than female children. Likewise, male children who contributed more household resources than other children had higher mean scores than female children who contributed an equivalent amount of resources to the household. Therefore, the male gender tended to be favored over the female gender.

Implications of the Study and Suggestions for Future Research

Implications for theory, research, and practice are elaborated in this section.

Implications for Theory

There is evidence in the literature of the need to study how resources are allocated within households inorder to design more effective intervention programs (Rogers & Schlossman, 1990). This study accomplished that purpose and added to the body of existing literature, thus providing further direction in this regard. The study highlighted 12 family contexts that maximized children's nutritional status and contrasted them with 12 contexts that failed to do so. With the identification of the most predominant contributors of child nutritional status, it becomes possible in future research to focus on those family contexts that maximize child nutritional status. Those contexts were represented in part by (a) family financial adequacy in contrast to inadequate family finances, (b) mothers with secondary or post-secondary education in contrast to mothers with no schooling experience or primary school levels, (c) fathers in skilled occupations in contrast to fathers in unskilled occupations, quarry workers, or unpaid subsistence farmers,

(d) mothers who were engaged in market economy production or wage earning employment in contrast to mothers who were engaged in unpaid subsistence production, (e) mothers who participated in family decision making processes in contrast to mothers who did not participate in decision making activities, (f) mothers who made decisions autonomously in contrast to mothers who did not make decisions autonomously, (g) mothers who spent less time on unpaid subsistence production and more time in wage earning employment in contrast to mothers who spent a lot of time in unpaid subsistence production, (h) households with multiple cooking facilities in contrast to a single traditional woodfire facility (traditional 3-stone woodfire), (i) the ability of households to provide diversified diets for their children in contrast to monotonous carbohydrate based diets, (j) the administration of a need based strategy in allocating food to children rather than applying a non-need based strategy such as distributing equal portions to all children, children sharing from a common plate, or according to sex, age, food availability, or child's contribution to household resources, (k) children in good health conditions in contrast to children suffering from frequent ailments or malnutrition, and (1) children who were actively engaged in contributing resources into their households (producers) rather than children who were engaged in consuming resources (consumers), controlling for age.

This study has demonstrated the utility of conceptualizing intrahousehold resource allocation from a family resource management perspective. It has been useful to assume that child nutritional status is an output of several household inputs that have been transformed through the throughputs of decision making processes in the family. These assumptions have led to the identification of 12 distinct family contexts that maximize child nutritional status. This study has also suggested the utility of specifying decision making power within the household. Mothers' participation in decision making and mothers' decision making autonomy were found to have predictive power in relation to child nutritional status, both as input variables and as throughput variables. The decision making power measures were derived from 16 specified family tasks ranging from household maintenance and subsistence production to status placement or investment decisions (Appendix C). All these variables showed analytical promise because they cut across broad categories of family decision making activities.

Implications for Research

It has been shown through this study that some family contexts maximize the development of optimal nutritional status in children, while others fail to do so. Future

research is needed to define the contexts more specifically. For instance would research with different populations such as wealthy rural and urban settings produce similar results? The answer to this question may be obtained through longitudinal data utilizing samples with similar and dissimilar characteristics, in different agricultural and climatic seasons which affect food availability, with children of different ages, in different localities of the country. The use of direct observation in addition to time and dietary recall interview may produce more reliable data.

While this study has delineated and operationalized some of the key intrahousehold resource allocation and decision making dimensions of child nutritional status, it did entail certain measurement weaknesses. Analyzing these weaknesses requires future research design considerations. For instance, while some of the data reduction procedures were developed at the pretest stage, most were not established until after data collection was completed. This probably decreased the validity of the instruments. improving the various measures applied in this research, it would be desirable to explore what family systems cause child nutritional status to fluctuate from normal to severe malnutrition, and which systems cause child nutritional status to remain stable at any point on the continuum. would be useful to adapt the family resource management perspective to child welfare outputs other than nutritional

status. Ultimately it could also be adapted to fit other family welfare outputs.

Implications for Practice

It is hoped that knowledge gained from this study will be applied for the improvement of Kenya's children's nutrition. In relation to intervention programs, the short-term focus should be on those children who were considered as severely malnourished, and a long-term focus should be on health promotion, nutrition promotion, and education. The importance of mothers' education, income earning occupations, participation in family decision making processes, ability to diversify children's diets, and the administration of a need based practice in allocating food to children should be incorporated into nutrition education programs for this particular community.

The sample families were concerned about unemployment, irregular incomes, the lack of clean water supply in the area, lack of firewood (source of cooking fuel), lack of government health centers at reasonable distances, unavailability of a nutrition rehabilitation center for malnourished children, and adequate public schools for their children within reasonable walking distances. These constraints probably have an adverse effect on the environment for the development of families and children.

In summary, it has been shown through this study that some family contexts maximize the development of optimal nutritional status in children, while others minimize it.

Although some answers have been provided through this study, future research offers the promise of even more. Children are the resources of the future, therefore their growth and development are important enough to warrant special attention.

Implications for policy

Central to the family ecosystem framework is the assumption of the critical science perspective which incorporates the emancipatory mode of rationality. This perspective also incorporates implications of policies for families and children. Although this study began with an empirical design, with data analysis and interpretation, it became necessary for the researcher to consider the implications of a critical science framework.

The objective of critical science is to enlighten and to educate; to emancipate from false consciousness by uncovering factors in the environment that make people define reality in specific ways. Inferred in the concept of critical science perspective, are programs designed and implemented for the benefit of children and their families that would improve their quality of life (Bubolz, 1985).

The ability of families to meet their children's nutritional needs is critical to their well being. example, some researchers have suggested that stunted growth, mental retardation, and some socio-emotional disorders have their origins in early feeding patterns. Data shows that development may be seriously affected by dietary deficiencies, and concern exists that these damages may be permanent. The development of future generations of Kenya's children can be enormously enhanced if much of this accumulated scientific knowledge was applied. However, some families are totally incapable of providing the most basic needs of life to their children due to inadequate or total lack of resources. In order to address the needs of such families with young children, policies should be formulated that include cost effective strategies. A wholistic consideration of the political, social, and economic systems are necessary so that the immediate needs of these children, who are the most vulnerable section of the population can be Strategies which include providing families with young children with adequate nutrition, adequate health care, educational services, clean water supply within reasonable distances, decent shelter, and efficient sources of cooking energy can influence and enhance the quality of life of families and the optimal development of their children. Efforts to improve the total development of children can best be accomplished by consideration of all levels of a

child's ecosystem from the microsystem to the macrosystem.

The socially conscious Kenyan food and nutrition policy established in 1981 could become the basis of an ecologically based comprehensive nutrition program that would coordinate activities between the ministries of agriculture, health, education, and non-governmental organizations interested in raising the level of nutritional health of young children ages 0-6 years and their families. Within an ecological framework, these are possible strategies that could be implemented: (a) health professionals would examine the nutritional health of the community and become aware of what deficiencies there are in their diets, (b) agricultural professionals would look into local food production and distribution, (c) home economics extension professionals would educate the targeted families about foods and nutrition by demonstrating methods of food preparation, ensure that severely malnourished children are fed at nutrition rehabilitation centers, and supply families with take home supplements, followed up by field observations during home visits, (d) early childhood education providers would monitor children's physical, cognitive, and socio-emotional development. They would also identify major deviations from normal development and refer children to appropriate professionals involved in the care Of young children for attention.

Implementation of these or other more comprehensive

strategies for improving the quality of life of Kenyan children and families is of great value to society. Kenya's children are tomorrow's human capital and leaders, as we invest in our young, we invest in our future nation.

APPENDICES

APPENDIX A

APPENDIX A

FATHERS' INTERVIEW GUIDE

PART I

INTERVIEWER NO	HOUSEHOLD CODE(1-3)
DATE	FATHERS' CODE1(4)
HOUSEHOLD DEMOGRAPHIC INFORMA	rion
We would like some background study. Please provide the for yourself and members of your	
First tell us something about	
5. What is your marital state (1) Married, living with	
(2) Never married (single	
(3) Separated	
(4) Divorced	
(5) Widowed(6) Living together, not	married
6. Is your marriage (1) mono	gamous or (2) polygamous?
7. If polygamous how many wi	ves do you have?
8-9. What is your age?	
	the families in our study, we your work and formal schooling.
First we would like some info 10. What do you do for a liv	
11. Where do you work: (1) whis location?	ithin this location (2) outside
Now give us some information	about your school experience:
12. What is the highest leve	l or year of regular school
have you completed?	
(1) No schooling	2 4 5 6 7 0
(2) Primary school 12_(3) Secondary sch. 12_	_345678
(4) College: 1-year pos	st-secondary training
(5) 2-year pos	st-secondary training
	ploma/certificate

	(7) Bachelor's degree
	(8) Other, specify
13.	Who is the head of this household?
	(1) Father (2) Mother (3) Other, specify
14.	What is your ethnic descent?
	(1) Kikuyu (2) Kamba

APPENDIX B

APPENDIX B

MOTHERS' INTERVIEW GUIDE

INTERVIEWER NO	PART I HOUSEHOLD CODE(1-3)			
DATE	MOTHER'S CODE2_			
HOUSEHOLD DEMOGRAPHIC INFO	PRMATION			
help us in our study. Ple	e information about your family to ease provide the following and members of your household.			
First, tell us something a 5. What is your marital s (1) Married, living w (2) Never married (si (3) Separated (4) Divorced (5) Widowed (6) Living together, 6-7. What is your age?	status? Tick one vith spouse .ngle) not married			
need to know something abo	of the families in our study, we out your work and formal schooling.			
8. What do you do for a l	- , ,			
9. Where do you work: (1) the location?	within the location (2) outside			
Now give us some informati	on about your school experience.			
have you completed? (1) No schooling (2) Primary school 1 (3) Secondary sch. 1 (4) College: 1-year (5) 2-year (6) 2-year (7) Bachel	evel or year of regular school 2 3 4 5 6 7 8 2 3 4 5 6 post-secondary training post-secondary training diploma/certificate or's degree specify			
We would like to know some	thing about your children.			
11. How many sons do you 12. How many daughters do				

13. How many miscarriages did you ha 14. How many children born to you di age, if any?	
Next, tell us something about your li	ving children.
15-17. First born (1) son or (2) dau	ghter,
age	htor
age	ncer,
age	
Now think about other members of your	
relationship to you (include relative	
helpers). Please provide the followi them.	ng information about
21. How many relatives live with you	
22. Do you have a housegirl/houseboy	
23. How many farm employees work for	
24. Who is the head of this househol	
(1) Father (2) Mother (3) Other, spec	Vikuus (2) Vamba
<pre>25. What is your ethnic descent? (1) (3) Other, specify</pre>	KIKUYU (2) Kamba
(3) Other, specify	-
With your permission, I would now li	ke to take child X's
measurements: height and weight.	
26. Sex of child (1) male (2) fem	ale
27-28. Date of birth: MonthDay	Year
29-30. Birth order 1 2 3 $\frac{1}{4}$ 5 $\frac{1}{6}$	
31-37. Height cm. NCHS P 38-43. Weight kg. NCHS P	ercentile H/A
38-43. Weight kg. NCHS P	ercentile W/A
44-45. NCHS Percentile W/H (Weight f	or height)
Observe the child for the following c	linical signs of
malnutrition or other forms of morbid	
46. Thin, sparse depigmented hair:	yes no
47. Edema	yes no
48. Muscle wasting	yes no
49. Pot belly	yes no
50. Cracked lips	yes no
51. Dermatosis (Flaky skin)	yes no
52. Other, specify	
53. Diarrhea	yes no
54. Vomiting	yes no
55. Colds/coughs	yes no
56. Eye infections	yes no
57. Ear infections 58. Burns	yes no yes no
 50. Burns 59. Other physical accidents, specif 	

60. Any other observation_____

APPENDIX C

APPENDIX C

FATHERS' AND MOTHERS' INTERVIEW GUIDE (ADMINISTERED TO EACH PARENT SEPARATELY)

INTRAHOUSEHOLD RESOURCE ALLOCATION AND DECISION MAKING **PATTERNS**

For a better understanding of the families in our study, we need to know something about your family's time use and income.

TIME ALLOCATION First, we would like some information about how you spend your time. Please recall all the activities you did yesterday from the time you rose up till the time you went to sleep and how much time you spent on each activity. ACTIVITY TIME SPENT IN HOURS/MIN. 1. Paid work/job Unpaid farm work 2. Child care (feeding, bathing) 4. Housework (cooking, washing) 5. Fetching water 6. Collecting firewood 7. Care of animals 8. Other, specify 9. How are household responsibilities allocated among family members? 10. Are these responsibilities transferable among male and female members? (1) yes (2) no. Explain

FAMILY INCOME

Now, we would like some information about your family income for the last agricultural season:

- 11. Is this farm yours? (1) yes (2) no.12. If yes, did you (1) purchase (2) inherit (3) lease it?
- 13. How big is the farm? Acres.
- 14. Please give us some information on the farm products you produce for home use and/or for sale:

FARM 15.	PRODUCT Maize	AMOUNT	PRODUCED	AMOUNT	SOLD	UNIT	PRICE
16.	Beans						
							
17.	Potatoes						
18.	Bananas						
19.							
20.							

21.
22.
23. Cows
24. Milk
25. Chicken
26. Eggs
27. Goats/sheep
28. Pigs
29-33. TOTAL FARM INCOME
34. Please indicate from where your family obtained food for the last agricultural season: (tick all that apply) (1) Farm production (2) Market purchase (3) Barter (4) Borrowing (5) Gifts (6) All the above 35. If by purchase, whose income was used to buy food? (1) Father (2) Mother (3) Both parents 36. Rank in order the first three sources of income for your family. 1 2 3 37-41. What is your contribution to family income on monthly basis in cash? KSH. 42. In-kind (non-money) contribution Did you receive money, food, or other gift last season from
anyone or any organization? Please explain the kind of help you received, how frequently and amounts received. 43. Types of help 44. How frequently received 45. Amounts received (1) as much as needed (2) less than
needed (2) less than
If you gave away food, money, or other gifts to others last season please give us some information on the following: 46. Types of gifts given away
47. How frequently you gave away 48. Was the income you received last season from all sources
enough for your family to live on? (1) yes (2) no
49. Please Explain
50. Did you have some savings after meeting your needs?
(1) yes (2) no
51. Please explain
52. Do you have any debts now? (1) yes (2) no
53. If yes, where did you obtain credit/loan from
54. How would you describe your family financial condition
now? (1) not enough (2) barely enough (3) enough
now? (1) not enough (2) barely enough (3) enough 55. How many people besides your children depend on your ordered income?
56. Where do you obtain cooking fuel: (1) Farm (2) Market (3)
Other, specify
57. Where do you obtain water for household use: (1) man-made dam (2) borehole (3) shallow well (4) river (5) piped
- Made dam (2) Dorenoje (3) snajiow weji taj river isi ninen

water (6) home tapped rain water

58. How far do you fetch water?

Miles

59. What kind of cooking facility do you use?

(1) traditional woodfire (2) charcoal burner (3) paraffin stove (4) modern energy saving woodfire (5) gas cooker

(6) electric cooker

60. Observe the house type: (1) traditional mud & grass thatch (2) mud & iron sheet roof (3) timber (4) bricks (5) stone

INCOME ALLOCATION/PERCEPTION OF PARTICIPATION IN ALLOCATION

Families manage resources in different ways. We would now like to know how your family allocates its resources among its members, and how those decisions are made.

KEY: 1=FATHER 2=MOTHER 3=BOTH PARENTS 4=SONS 5=DAUGHTERS 6=SONS & DAUGHTERS 7=ALL FAMILY MEMBERS 8=OTHERS e.g. GRANDFATHER/GRANDMOTHER

Which types of the following incomes are pooled?

INCOME TYPE	WHO BRINGS IT	IS IT POOLED	WHO IS IN
	2111100 11	10 11 100225	CHARGE
61. Salary	62	63	64
65. Crop sale	66	67	68
69. Cash crops	70	71	72
73. Milk sale		75	76
77. Egg sale	78	79	80
81. Animals	82	83	84
85. Is money i	ncome pooled (3	entirely (2)	partially
(1) none at al		,	•
	tes the pooled	income: (1) fat	her (2) mother
	ts (4) other, s		(2,
	oled income spe		
1	2	3	
88. Who spends	the pooled inc	ome: (1) father	(2) mother (3)
	4) other, speci		(2, 300 2002 (3,
89. Rank order	the first 3 fa	milv priorities	for money use
1	2	3	200
90. If money i	s NOT POOLED, O	R IF POOLED ONL	Y PARTIALLY, who
	f your PERSONAL		
			s for money use?
.1	2	3	
92. Who partic	ipates in making	g family financ	ial decisions?
	mother (3) oth		
	ey income alloc		ly members?
	to earner's des		
	to a family pla		
	to the person i		
(5) other, spe			
			

94. What kind of support (work or money) do your SONS

```
Indialy

- What do by

- What he done he bills the wind the find dealer

- Before he have

- I not reserved

- Und
```

contribute to the household?
1 2 3 95. What kind of support (work or money) do your DAUGHTERS
contribute?
1 2 3 96. Do sons or daughters get any preference in any resource
96. Do sons or daughters get any preference in any resource
allocation such as food, school fees, or clothing? 1 Yes
2 No
97. If yes, who receives more food? (1) sons
(2) daughters
98. Please explain how you allocate food to your children
99. If you had limited amounts of money for school fees,
whom would you take to school? (1) son (2) daughter
100. Please explain
101. If you had limited amounts of money for medical care,
whom would you take to hospital when sick? (1) son
(2) daughter
102. Please explain
103. Who contributes more to household resources? (1) sons
(2) daughters
104. Please explain
105. Who spends more of the family income (1) sons
(2) daughters
106. Please explain
DECISION MAKING PARTICIPATION AND IMPLEMENTATION
We would now like to know who participates in making
decisions on specific family issues, and who actually
implements those decisions.
VEV. 1 DAMADD O MOMUDD O DOMU DADDAMO A COMO C DAMAMEDO
KEY: 1=FATHER 2=MOTHER 3=BOTH PARENTS 4=SONS 5=DAUGHTERS
6=SONS & DAUGHTERS 7= ALL FAMILY MEMBERS 8=OTHER e.g.
GRANDFATHER/GRANDMOTHER
WHO PARTICIPATES IN MAKING DECISIONS? WHO IMPLEMENTS?
2 Whoma ha abhain faad :
3. Where to obtain food 4
5. Food preparation 6 8
11. MCGICGI CGIC
13. Cloching money
15. Children's education 16
17. Falm work
19. Grazing animals 20
21. Feeding Chicken 22
23. Buying a farm 24 25. Building a house 26

29. 1 31. 0	Lending money Gift giving	_ 30 _ 33	0 2
(2)	How are the above decisions made each member decides alone (3) a other, explain	ccordi	
follo 34. I 35. I 36. I 37. I	much participation do you thingowing activities? Household task allocation (1) referred task allocation (1) none (1) referred task allocation (1) referred task allocation (1) referred task allocation (1) referred task allocation (1) none (2) so see estimate how much money you gories of expenditure per month	none (2) (2) some none (2) ome (3)) some (3) a lot e (3) a lot) some (3) a lot a lot
CATE		COST I	N KSH
39. 1 40. 1 41. 1 42. 5 43. 8 44. 8 45. 1 46. 2 47. 1 48. 6 49. 5 50. 1	Family food Family health Family clothing Family housing Transportation School fees School uniform Farm work Animal care Househelp/maid Other, explain TOTAL EXPENDITURE PER MONTH What is your monthly income?		
Fami: We an aged refer	D CARE/FEEDING lies look after their young chi re interested in knowing how yo between 3 to 6 years is looked r to the identified child who n not entered standard 1, hereaft	our OLD dafter meet the	EST PRESCHOOL CHILD . All questions e age criteria and
KEY:	1=FATHER 2=MOTHER 3=BOTH PAREN NS & DAUGHTERS 7= ALL FAMILY MI DFATHER/GRANDMOTHER 9=CHILD	NTS 4=S0	ONS 5=DAUGHTERS
52. I (1) (Which follows	Who takes care of child X? Do you pay the child caretaker cash (2) in-kind (3) not at all himmember spends time with child owing activities? Preparing food Feeding child	l	

62. Check if diet has 1-food group 2-food groups 63. Was the child fed anything DIFFERENT last week? (1) yes (2) no 64. If yes, what was different. 65. How is food allocated to child X? 66. How is child X's appetite 1) poor 2) fair 3) good 67. If you had all the resources you desired e.g. time, money and food, what would you feed child X CHILD HEALTH CONDITION We are interested in knowing about the health of young children. Please give us some information about the health of child X. 68. Has child X received childhood immunizations (BCG, DPT, POLIO, MEASLES)? 1) yes 2) no 69. Has child X been ill or unwell within the past 7 days? 1) yes 2) no 70. Within the past week, has child X had any of the following conditions? Circle the relevant answers 1) diarrhea or vomiting 2) cold/cough 3) sore throat 4) eye infections 5) ear infections 6) stomach pains 7) worms 8) burns 9) other, explain 71. If yes to any condition above, what measure did you take to alleviate the problem? 1) hospital/clinic 2) self/shop medication 3) traditional/herbal treatment 4) prayers 5) no treatment 72. Has child X attended a hospital/clinic within the past 1 month? 1) yes 2) no 73. If yes, what health problem did child X have?	55. Bathing/dressing child 56. Child health care 57. Play with child 58. Reading/story telling 59. Who has the primary responsibility for providing food to this family? 60. Who fed the child yesterday? 61. If the person who fed child X is available, ask what was given from the time the child rose up till the time he/she went to sleep yesterday.
We are interested in knowing about the health of young children. Please give us some information about the health of child X. 68. Has child X received childhood immunizations (BCG, DPT, POLIO, MEASLES)? 1) yes 2) no 69. Has child X been ill or unwell within the past 7 days? 1) yes 2) no 70. Within the past week, has child X had any of the following conditions? Circle the relevant answers 1) diarrhea or vomiting 2) cold/cough 3) sore throat 4) eye infections 5) ear infections 6) stomach pains 7) worms 8) burns 9) other, explain 71. If yes to any condition above, what measure did you take to alleviate the problem? 1) hospital/clinic 2) self/shop medication 3) traditional/herbal treatment 4) prayers 5) no treatment 72. Has child X attended a hospital/clinic within the past 1 month? 1) yes 2) no	groups 63. Was the child fed anything DIFFERENT last week? (1) yes (2) no 64. If yes, what was different. 65. How is food allocated to child X? 66. How is child X's appetite 1) poor 2) fair 3) good 67. If you had all the resources you desired e.g. time,
POLIO, MEASLES)? 1) yes 2) no 69. Has child X been ill or unwell within the past 7 days? 1) yes 2) no 70. Within the past week, has child X had any of the following conditions? Circle the relevant answers 1) diarrhea or vomiting 2) cold/cough 3) sore throat 4) eye infections 5) ear infections 6) stomach pains 7) worms 8) burns 9) other, explain 71. If yes to any condition above, what measure did you take to alleviate the problem? 1) hospital/clinic 2) self/shop medication 3) traditional/herbal treatment 4) prayers 5) no treatment 72. Has child X attended a hospital/clinic within the past 1 month? 1) yes 2) no	We are interested in knowing about the health of young children. Please give us some information about the health
74. What treatment was child X given?	POLIO, MEASLES)? 1) yes 2) no 70. Within the past week, has child X had any of the following conditions? Circle the relevant answers 1) diarrhea or vomiting 2) cold/cough 3) sore throat 4) eye infections 5) ear infections 6) stomach pains 7) worms 8) burns 9) other, explain 71. If yes to any condition above, what measure did you take to alleviate the problem? 1) hospital/clinic 2) self/shop medication 3) traditional/herbal treatment 4) prayers 5) no treatment 72. Has child X attended a hospital/clinic within the past 1 month? 1) yes 2) no 73. If yes, what health problem did child X have?

^{75.} Whose income is used to pay for children's medical care?

1) father 2) mother 3) both parents

76. How would you describe the overall health of child X?

1) mostly sick 2) occasionally sick 3) mostly healthy

- 4) in good health
 77. How far is the nearest heath center/hospital to you? Miles
 78. Observe the household and compound sanitation condition
- 1) poorly kept 2) fairly clean 3) clean

APPENDIX D

ASPLANTOF PEGENDENT FOR RESEARCH

EAST LANSING . MICHIGAN . 48824-1046

Lucy W. Ngige 1413-I Spartan Village East Lansing, MI 48823

RE: INTRAHOUSEHOLD RESOURCE ALLOCATION AND DECISION HAKING CORRELATES OF CHILD HEALTH AND NUTRITIONAL STATUS IN RURAL THIKA, KENYA, IRB #92-269

Dear Ms. Ngige:

UCRIHS' review of the above referenced project has now been completed. I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and the Committee, therefore, approved this project at its meeting on July 6, 1992.

You are reminded that UCRIHS approval is valid for one calendar year. If you plan to continue this project beyond one year, please make provisions for obtaining appropriate UCRIHS approval one month prior to July 6, 1993. This may be accomplished by writing UCRIHS to stipulate that:

- The human subjects protocol is the same as in previous studies.
- 2. There have been no ill effects suffered by the subjects.
- 3. There have been no complaints by the subjects or their representatives.
- 4. There has not been a change in the research environment nor new information which would indicate greater risk to human subjects than that assumed when the protocol was initially reviewed and approved.

There will be a maximum of four renewals possible. If you wish to continue a project beyond that time, it must again be submitted for complete review.

Any changes in procedures involving human subjects must be reviewed by the UCRIHS prior to initiation of the change. UCRIHS must also be notified promptly of any problems (unexpected side effects, complaints, etc.) involving human subjects during the course of the work.

Thank you for bringing this project to our attention. If we can be of any future help, please do not hesitate to let us know.

Sincerely,

David E. Wright, Ph.D.) Chair, University Committee on Research Involving Human Subjects (UCRIHS)

DEW/pjm

APPENDIX E



OFFICE OF THE PRESIDENT

PROVINCIAL ADMINISTRATION AND INTERNAL SECURITY

Telephone: Nairobi 27411
When replying please quote

Rd. No. 13/001/22C 142/3

and date

P.O. Box 30510 NAIROBI

25th June

19 92

Michael Hornsby, African-American Institute, 833 United nations Plaza, New York, New York 10017, U. S. A.

RE: RESEARCH PERMIT APPLICATION NRS LUCY NGIGE

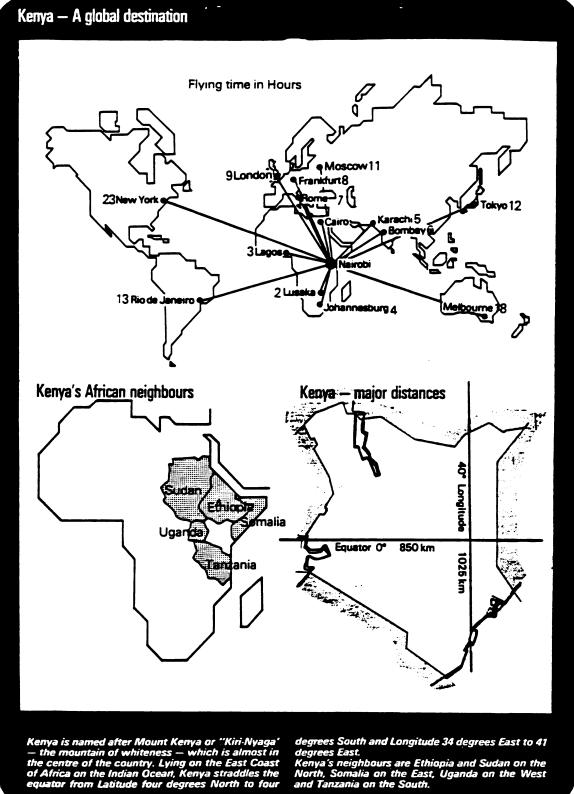
We refer to your telex message dated 21st June, 1992 concerning the above named student currently pursuing a Ph.D Program in Home Economics. We are also in receipt of her other documents required for research permit clearance.

We would, therefore, wish to assure you that Mrs Ngige would be issued with a research permit on her arrival in the country. In the normal practice, permits are not mailed to applicants but rather they have to be signed for and collected personally from this office.

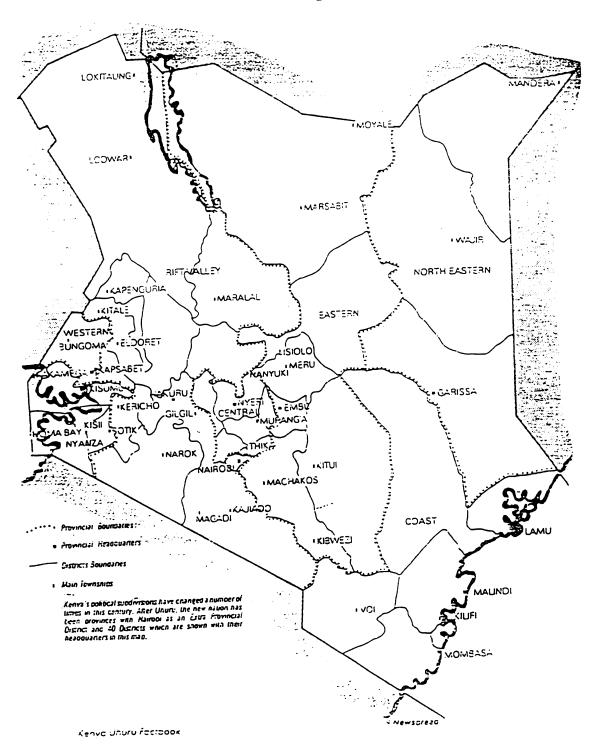
It will be appreciated if the necessary arrangements are finalized by you to enable her undertake the research project.

FOR: PERMANENT SECRETARY/ADMINISTRATION

APPENDIX F



© Newspread



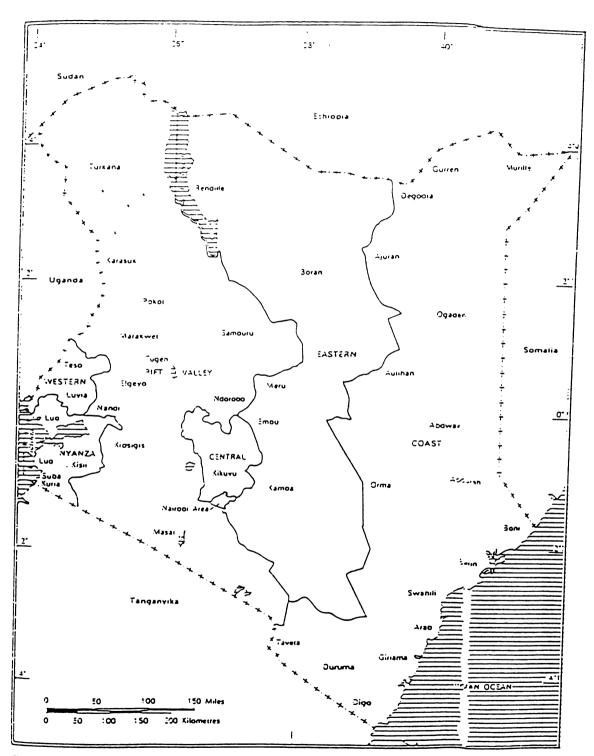


Fig. 1.11 Regional boundanes resulting from the Regional Boundanes Commission, 1962

Ojany and Ogendo (1973), pp. 15

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