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Anthropological Contributions to the Study of Malnutrition: The Nutrition CRSP Kenya Project

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Few people need to be reminded of the debilitating consequences of malnutrition. Throughout the developing world, lack of adequate food is a constant threat to individual health and societal well-being. Yet, the causes and consequences of insufficient nutrient intake are not well understood. Herein lies a major challenge for researchers from both biological and social sciences. Two disciplines, nutrition and anthropology, have obviously important roles to play, and they have recently joined efforts in the study of malnutrition and its consequences.

Because the history of joint research efforts between anthropologists and nutritionists is short, we are only now beginning to realize the rich possibilities for combining their respective research focuses (Jerome et al. 1980). Using the Kenya project as an example, this chapter discusses specific areas wherein sociocultural anthropology and nutrition research complement each other. First, we examine similarities and differences between anthropological and nutritional approaches to the study of chronic mild-to-moderate malnutrition. Anthropological contributions to the Nutrition CRSP's study of the functional consequences of such malnutrition are then outlined. In particular we review the Kenya study's major anthropological data components and detail two research methodologies that place the project's core nutrition hypotheses in a broader social and economic context.

ANTHROPOLOGISTS AND NUTRITIONISTS

Anthropologists and nutritionists employ complementary approaches to the study of malnutrition. Historically, the former have looked first at the sociocultural context of food, primarily employing observational techniques; the latter have focused on the biological dimensions of nutrition, taking more experimental approaches (Harrison and Rittenbaugh 1981). However, these

differences are becoming less pronounced with the growing recognition of the importance of studying dietary intake in a behavioral context. Today, anthropologists and nutritionists share a more holistic perspective, conceptualizing nutrition as a result of complex social and biological interactions.

As evidenced by the CRSP project discussed here, nutrition researchers have abandoned single measures of nutritional adequacy in favor of a broader functional definition. While they still conduct quantitative nutrient analyses, they are expanding the range of variables hypothesized as causally related to varying levels of food intake. Changes in individual growth, reproduction, illness, and physical work are seen as functional outcomes of the quantity and quality of nutrient intake. To establish the causal linkages between food intake and functional outcomes, analysis must acknowledge that the functional relationships exist in a sociocultural context; hence human beliefs and behavior must be integrated as intervening variables.

Integration requires input from social scientists trained in the investigation of the behavioral and cultural components of growth, reproduction, illness, and work. The anthropologist's role is to articulate the outcome measures of interest to nutritionists with other components of the sociocultural system. This task calls for the systematic collection of a broad range of sociocultural data that can be integrated into the functional outcome models generated by nutritionists.

FUNCTIONAL CONSEQUENCES OF MILD-TO-MODERATE MALNUTRITION

As Cattle (this volume) points out, chronic mild-to-moderate malnutrition is a health and social problem warranting increased research by nutrition scientists. No precise estimate of the number of individuals suffering from chronic malnutrition is available. Its symptoms and consequences are not well understood, and it is therefore difficult to define and measure. Agreement is unanimous, however, that the problem is rampant throughout the developing world (Behar 1981).

The little information that is available suggests that while 1%–3% of children worldwide show signs of severe protein-energy malnutrition, at least 10 times as many children have symptoms of less severe malnutrition (Bengoa and Donoso 1974). Also, there are many claims that in developing countries 50%–60% of children under 5 years of age suffer from chronic moderate malnutrition (Behar 1981:237). In Kenya, for example, an estimated 30% of the children studied in the Kenyan National Nutrition Survey are subject to chronic mild-to-moderate protein energy malnutrition (Government of Kenya 1977, 1978/79, 1982). Another study concluded that 25% of

Kenyan children under age 5 are moderately malnourished, defined as 60%–75% or 70%–80% reference weight for height (FAO 1977).

The Nutrition CRSP began research on the consequences of mild-to-moderate malnutrition in a global context. The comparative research model employed resulted from the combined efforts of the three Nutrition CRSP projects in Egypt, Kenya, and Mexico. The program did not completely discount malnutrition indices derived from nutrient requirements measurements, usually expressed in calories/day—e.g., 2,700 cals/day/70-kg male (NAS 1974)—or from anthropometry (e.g., height-for-weight, weight-for-age) or biochemical analyses. However, it aimed to explore more comprehensive explanations of malnutrition. Specifically, the CRSP conceptualized malnutrition within a functional framework that sought to correlate food intake with individual performance in several critical functional areas, defining malnutrition as

> a state in which the physical function of an individual is impaired to the point where she or he can no longer maintain adequate performance in such processes as growth, pregnancy, lactation, physical work, or resisting and recovering from disease (Pacey and Payne 1985:24).

The program stressed investigation of five categories of functional outcome of moderate malnutrition (the independent variable): (1) cognitive/psychomotor skills development; (2) physical growth and nutritional status; (3) severity and frequency of illness episodes; (4) level of resting metabolism and activity expenditure; and (5) cultural practices of health and socioeconomic importance.

These five categories are interrelated and subsume more specific interactions. The model is therefore primarily a heuristic device for organizing research and suggesting more specific hypotheses. Six major research hypotheses were formulated (Table 7.1). They constitute the research core of the Nutrition CRSP. The hypotheses are explicit and overlapping, requiring a wealth of detailed social and biological data. The field research teams faced three major challenges in developing the necessary data collection methodologies: (1) each specialist needed to adjust collection procedures to the ethnographic setting; (2) the measures had to be applicable to the research interests of different specialists; and (3) the methodologies needed to be synchronized so that information was collected at intervals relevant to the various research interests.

The Kenya project, undertaken by the University of California Los Angeles (UCLA) in collaboration with the University of Nairobi, involved nutritionists, physicians, psychologists, epidemiologists, and anthropologists. The project investigated the biological and social consequences of chronic mild-to-moderate malnutrition among the Embu people of central

TABLE 7.1. MAJOR RESEARCH HYPOTHESES TESTED BY NUTRITION CRSP

H_{1a}	Maternal food intake during pregnancy and lactation influences the infant's endowment at birth and its development during the first six months of breast-feeding.
H_{1b}	Maternal intake during pregnancy and lactation influences maternal child care and sanitation practices in relation to the infant.
H_{2a}	Food intake of the toddler during the period from 18-30 months affects the toddler's morbidity, body weight, and psychological development.
H_{2b}	Maternal intake during this period affects maternal child care and sanitation practices in relation to the toddler.
H_{3a}	Food intake of the 7-9-year-old child affects her/his morbidity and behavior, including school performance.
H_{3b}	Food intake of the mother and father influences their behavior toward the child and hence the morbidity and behavior of the child.
H_{4a}	Food intake of adults influences their morbidity, social-emotional responsiveness, and performance of usual responsibilities.
H_{4b}	These impact upon other members of the household (as stipulated in previous hypotheses).
H_5	In adults, a reduction of resting metabolic rates provides a major path of adaptation to restore energy equilibrium.
H_6	Household food intake affects household morbidity.

Kenya. The Embu are a Bantu-speaking group, occupying the southeastern slopes of Mount Kenya. Numbering 180,400 or 1.2% of Kenya's total population, the Embu are one of the country's smaller ethnic groups (Government of Kenya 1979). They are small-scale farmers who cultivate maize, beans, sorghum, and millet as food crops, and coffee, cotton, or tobacco for market sale. Households also maintain a few head of livestock and engage in casual or permanent wage labor to varying degrees.

Based on preliminary surveys, feasibility studies, and information from the Ministry of Health and the Department of Community Health at the University of Nairobi, three sublocations within the Kyeni South Location of Embu District were selected as study sites. These sublocations are inhabited by 11,810 individuals, residing in 2,059 households, and averaging 5.7 individuals per household (Government of Kenya 1979). The CRSP study population consisted of all sublocation households that included either a head female who had been pregnant for less than three months or a toddler who could be observed during his or her 18–30-month growth period. The head male and any school children aged 7-9 were also classified as target individuals. The project conducted data collection from January 1984 through March 1986. A total of 247 households were studied for a minimum of one year.

ANTHROPOLOGICAL CONTRIBUTIONS TO THE KENYA PROJECT

From the outset, project anthropologists were encouraged that CRSP nutritionists viewed food intake as systematically related to a series of functional outcomes. Moreover, anthropologists saw exciting methodological challenges to incorporating a more holistic understanding of mild-to-moderate malnutrition into project hypothesis testing and analysis. For example, in addition to the Nutrition CRSP's primary focus on the functional consequences of varying levels of food consumption, a secondary focus on the Kenya study population's agricultural system was deemed imperative, particularly from an anthropological perspective. Of special importance was documenting the production outcomes of Embu farmers' cropping strategies.

During field research in Embu District, anthropological contributions took many different forms. A number of research components were designed and implemented primarily by anthropologists. We describe six of these components briefly, and then discuss two others in detail—the agricultural production and the time allocation studies. The goal of the latter two research strategies was to examine which combinations of agricultural practices provided the best level of nutritional intake.

Census update. Information on household and community demographics is mandatory baseline data for any sociocultural or nutritional investigation. The explanation of many household interactions of nutritional importance requires an understanding of the age, gender, status, or social position of the individuals involved. To collect such data, each enrolled household was censused every three months and its current composition compared with the previous record. Information collected on each individual included name, sex, birth date, marital status, social position, education, and amount of time away from location. Details of any deaths were also recorded.

Socioeconomic status. The nutritional characteristics of a household are closely related to its social position and economic well-being. Generally, higher social position and greater economic wealth translate into better nutrition. However, this relationship is not straightforward because of myriad socioeconomic factors both within and between households. To record such factors, a socioeconomic questionnaire was administered every third month. Social status questions addressed issues of education, leadership qualities, community participation, and noneconomic skills; economic questions focused on the household's agricultural and animal husbandry practices, material possessions, and income.

Sanitation and hygiene. Hypotheses 1 and 2 in Table 7.1 investigate whether maternal food intake influences the target mothers' sanitation and hygiene practices in relation to infants and toddlers. To provide data on this issue, as well as on general household cleanliness, every third month a questionnaire was administered regarding personal hygiene for the lead female, infant, toddler, and school child. Other questions sought information on the cleanliness of the kitchen, sleeping quarters, and compound. Additional information was collected on the location and type of latrine.

Household economics. In order to place food consumption within a broader economic context, project anthropologists developed a questionnaire on production of agricultural commodities. This instrument investigated the availability and utilization of crop land. Information collected was based either on receipts for crops sold (coffee, cotton, tobacco) or on informant recall. Data on marketing strategies were also collected. To complement the emphasis on production, the questionnaire also asked for information on household educational expenses.

Energy expenditure. The functional approach to defining malnutrition investigates whether individuals experiencing a particular level of nutrient intake are able to perform the physical work necessary to secure a livelihood. One useful measure of work is the number of calories expended in production activities. To determine the caloric price tag for each activity, both the amount of time the average individual spends in a given activity and the amount of energy expended per unit of activity-time must be calculated. The energy expended in a representative range of daily activities (work and nonwork) was measured with a Max-Plank respirometer. Heart-rate monitors supplemented this method of indirect calorimetry. Fourteen individuals participated in this study, and over 200 tests were completed. These energy expenditure data complemented the project's laboratory testing of resting metabolic rate (physiological change outcome function).

Child care. The quality of care given to infants and toddlers was hypothesized to be functionally related to a mother's nutritional status and her general activity pattern. Infants were observed at ages 2, 4, and 6 months, and toddlers were followed bimonthly during the 18–30-month stage. Each observation period lasted two hours, during which time the field enumerator recorded the type and quality of care received by the target child. Particular attention was given to coding who cared for the child (mother, sibling, grandparent, etc.), how the care was administered (holding, touching, calming, cleaning, watching, and so forth), and circumstances in which no care was given in situations of obvious need. Besides coding the observed responses and interactions, enumerators wrote qualitative comments on what

they perceived as particularly typical or atypical instances of care or noncare. (Most enumerators were mothers themselves.) In addition, anthropologists periodically interviewed the field enumerators and a selected group of mothers about Embu perceptions of good versus bad care. A small sample of oral texts used to calm children was also collected.

Agricultural Production Studies

The Household Agricultural Crop Study (AG CROP). Administered monthly, this survey relied on recall to record agricultural activity. It was designed to complement the project's socioeconomic study on each crops with detailed agricultural data on the major food crops that were harvested, stored, sold, purchased, or planted during the previous month. AG CROP addressed the three food crops that each enrolled household identified as "most important" in terms of production, consumption, and/or distribution. As expected, households consistently reported maize and beans as two of the three most important crops. Other responses included bananas, cassava, arrowroot, potatoes, millet, and sorghum.

The information recorded for each crop included whether the crop was planted during the long rains (mid-March through June) or short rains (October through November) or whether it was a perennial (such as bananas), the year it was planted (1983–1985), and the household's reasons for considering this particular crop important. If during the past month, the crop was planted, harvested, sold (to a government marketing board, locally in open markets, or to middlemen), or given to relatives, then the amount in kilograms was recorded, as were the earnings in Kenyan shillings, where appropriate. The quantity of the crop in storage was also noted, along with any purchases of the crop during the past month.

AG CROP responses provided a wealth of basic information on Embu agricultural production. Because data were collected on a monthly basis, they capture seasonal fluctuations in food availability; these can in turn be related to observed trends in household food consumption and nutritional well-being over time.

The Household Agricultural Production Study (HAPS). Started in March 1985, HAPS measured the actual production inputs and outputs for a sample of household agricultural land-use systems. Prior to that time, agricultural data were gathered through farmer interviews. Depending on the informant's recall or her/his understanding of the questionnaire's units of measure, this technique left open to question the reliability of such key information as the household's garden area and crop yields. To collect more accurate data on agricultural production, project anthropologists decided to actually measure a sample of gardens and weigh crop yields. Additional

information on land tenure, agricultural inputs, cropping practices, and previous land use was also obtained.

HAPS consisted of a 25% subsample of households randomly selected from the 169 households still enrolled in the CRSP study as of March 1985. This yielded a sample of 42 households distributed evenly throughout the study area. Both subsistence and cash crop production was measured across an entire year in order to account for seasonal variation; the data are considered representative of the study area for the agricultural cycle of March 1985 to February 1986.

The investigation of garden production began soon after the new season's crops were planted. The first visit to each of the 42 households was devoted to explaining the study to participants, obtaining their consent and cooperation, and administering a miniquestionnaire focusing on agricultural inputs and practices (fertilizer, seed types, crop rotation, and other factors). Household gardens were also visually inspected, and appointments were scheduled for mapping.

When field staff returned as scheduled, a household adult accompanied them to the garden to identify its exact boundaries and any subdivisions. Actual mapping began once field staff were confident of the boundaries. With a starting point designated as Coordinate A, the team leader held her/his position while an assistant walked along the first "side" of the boundary carrying one end of a tape measure. The assistant staked the spot where the side ended (i.e., where the boundary took a turn), and that point was designated Coordinate B. The distance between the two coordinates was recorded, and the team leader determined the azimuth reading with a Brunton pocket transit by sighting on the stake at B. The team leader then moved to B, and the assistant proceeded to the end of the next "side," i.e., Coordinate C. This procedure continued around the boundary until the starting point was reached. The same technique was used to measure any distinct subplots of crop assemblages within the garden's boundaries (e.g., "maize only," "maize intercropped with beans") as well as any fallow areas.

Next, a map of the garden was drawn to scale using a protractor and rule. Scales of 1:500 and 1:1,000 were used for gardens of <4 and >4 acres, respectively. All coordinates, crop assemblages, and other important information were labeled on the map. Finally, a planimeter was used to calculate the area of all gardens and subplots from the scaled maps.

With completed maps in hand, HAPS teams returned to the gardens for a second visual inspection. These repeat inspections had two purposes: first, the map was compared with the now semimature garden, and any discrepancies were resolved; second, selected crop assemblages were ranked according to their anticipated level of production along four parameters -- high, medium high, medium, low. Only "maize," "beans," "maize with beans," and "beans with maize" assemblages were ranked since these are the

dietary staples of Embu households. This made for a possible total of 16 production/assemblage categories.

With the area of every maize and/or bean plot measured, and with every plot ranked according to anticipated production, the final task was to weigh crop yields from a sample of plots. After determining the total area of each of the four crop assemblages by the four ranks ("maize only—high," "maize only—medium high," etc.), plots were randomly selected until a 20% area had been reached within each category. Thus, for example, after determining the total area of "maize only—high," individual household plots were selected until their combined area equaled 20% of the total for maize ranked high.

The harvest of each plot within the 20% subsample was then weighed. For plots containing beans, the entire harvest was weighed immediately after threshing. For maize plots, the ears harvested from every fifth row were set aside and weighed after they had dried. Field staff assisted household members in harvesting and threshing in return for their cooperation.

The maize and bean weights obtained from the sample plots provide an excellent idea of a given household's level of food production. When compared with agricultural recall data for the same household, this information is invaluable. Taken together, the AG CROP and HAPS research strategies and their resulting data sets (one based on recall and the other on observation and infield measurement) reinforce each other and represent significant methodological and substantive contributions to holistic functional analyses of the causes and consequences of malnutrition.

Time Allocation

The immediate goal of the time allocation study was to provide behavioral data on activities directly and indirectly related to the research hypotheses. For example, testing of many of the hypothesized outcomes of chronic mild-to-moderate malnutrition required behavioral data for the lead female exclusively (hypotheses 1B, 2B), the lead male and female combined (3B, 4A), school-age children (3A), or other target children (3B, 4B). The necessary data were obtained through the application of a technique increasingly utilized by anthropologists and commonly referred to as "spot observation." This technique involves visiting households at random times of day to record the activities being performed by individuals.

In adapting the spot observation technique to any research setting, it is critical that the final protocol meet at least three conditions: (1) household members should be informed that they will be visited unannounced, but, to avoid observer's paradox phenomena, they should not know the exact time and date of each visit; (2) the time and day of the visit must be randomly selected; and (3) all hours and days under study (e.g., "daylight" hours on "weekdays") must be equally represented (Johnson 1975). Two additional

factors unique to the Kenya project had to be taken into account in applying this technique: the need to keep personnel assigned to the study to a minimum because of limited financial resources; a desire to guarantee equal coverage of all households.

To meet all these conditions, project anthropologists devised a unique approach. The time of visit for any specific household was not selected using a random numbers table. The study area was simply too large (60 km^2) and the sample too dispersed for the field staff regularly and within a reasonably short lenth of time to visit households located far apart. Instead, with maps indicating the exact location of each enrolled household and with fieldworkers' knowledge of the local terrain, a fixed route was established that minimized interhousehold travel time while still leaving visiting times unspecified. This process thus provided a randomizing element. The weather, length of visit, terrain, puncture of a bicycle tire, and other elements combined to vary arrivals at each household during each completion of the route.

The procedure can be summarized as follow: on the first day of the study, the first household on the circuit was visited at 7:00 A.M. by the fieldworker scheduled for that day's morning shift, who then proceeded by bicycle to each subsequent household along the route. She/he was replaced at approximately 12:30 P.M. by the fieldworker assigned to the afternoon shift. Rendezvous was facilitated by the use of inexpensive walkie-talkies. The afternoon fieldworker continued along the route and made the final visit of the day at 6:00 P.M. The next household on the circuit was then visited the following day at 7:00 A.M. Upon reaching the end of the route, the fieldworker returned to the first household, and the procedure began anew.

The spot observation technique requires the fieldworker to quickly note the various activities of household members before they respond to her/his arrival. These are the activities that are recorded and eventually coded. For instance, a fieldworker arrives at compound "X" at 7:00 A.M. Using a prepared form listing the names of each household member, the enumerator quickly identifies each individual and notes the activity she/he is performing. At this hour of the morning, examples of activities might include the lead female heating maize and beans for the morning meal; an infant being held by the lead female's mother, who resides in the household; a toddler sitting near the lead female and playing with eating utensils; school-age children washing and dressing in school uniform; and the lead male sorting maize seeds.

Because the Kenya project enumerators were from the local area and had worked with the households for over a year, they knew most of the sample members by sight. This facilitated rapid spot observation of activity and identification of member absences or, conversely, of new arrivals and visitors. If someone was absent, other family members were asked about her/his activity and location. If the absentee was within five minutes' walk, the enumerator would visit the location and verify the activity. If the

individual was far away, the activity was recorded as a report by family members. Activities were initially recorded in short, descriptive phrases (e.g., "lead male planting maize," "lead female washing infant"). These were then translated into activity codes, which in turn were keypunched and made computer-ready (Baksh and Paolisso 1987).

The time allocation study began in March 1985 and concluded in February 1986. A sample of 169 households, all enrolled as of March 1985, was visited from Monday through Friday between 7:00 A.M. and 6:00 P.M. and on Saturdays between 7:00 A.M. and 12:30 P.M. A few Sunday and evening visits were also made. During the course of the study, the route was completed 59 times, and each household was visited an average of 1.1 times per week. Moreover, data analysis shows that a balanced distribution of visits for each household and for all hours of the day was achieved. The hard work of the field enumerators enabled the Kenya project to collect approximately 86,000 observations of individual activity, making the Nutrition CRSP data base the largest time allocation study for a rural Third World population.

All data are now computer-entered and ready for analysis. Project staff at UCLA are undertaking preliminary analyses of a range of subjects. For example, CRSP anthropologists are asking questions about gender differences in time allocation, the role of siblings in providing child care, the amount of time households dedicate to various economic activities, and the effects of seasonality on household activities. Project nutritionists are looking at activities surrounding food preparation and consumption in order to identify patterns that help explain individual variation in dietary intake. Physicians are studying the illness data and behavioral responses to health problems in the family (e.g., what care is provided and by whom). In conjunction with anthropologists, physiologists are combining the energy-expenditure-in-activity measurements with the time allocation data to arrive at energy budgets for households, particularly during periods of intense activity and/or food shortage.

The foregoing represent only a few of the many possible uses for the data derived from the CRSP anthropologists' holistic time allocation study. The potential of such studies is immense. On the Kenya project, for example, the time allocation research produced data on *all* aspects of household life. This is evidenced in the major categories of activities used for coding observations: eating and drinking, food preparation, care of self and others, household labor, food production, cash labor, inactive, out of location, education, recreation, social, and other. Within each of these general activity categories, more specific codings of behavior can also be made (Baksh and Paolisso 1987).

As it was designed to do, the time allocation study provided invaluable information regarding the relationship among the relevant variables embodied in the CRSP's initial hypotheses. Furthermore, as field research progressed,

it generated important supplementary hypotheses. For example, do adults and children who consume relatively low amounts of food spend more time engaged in low-level energy expenditure activities? Do households that spend more time producing both food and cash crops enjoy better diets than those producing food crops only? Do households of relatively high socioeconomic status spend more time "working" than do other households, or do they instead engage in more leisure, recreation, and social activities?

In sum, the Kenya project's time allocation study is an excellent example of how social science strengthens biological or technical science research, and of how a holistic approach facilitates focused hypothesis testing by providing data on both primary and intervening variables. Spot observations are efficient and feasible, and they generate large amounts of high-quality data. This in turn enhances the anthropologist's ability to speak to specific questions of interest to both social and non-social-science colleagues.

CONCLUSIONS

Anthropologists unquestionably can contribute much to multidisciplinary projects. On the Nutrition CRSP in Kenya, anthropologists filled a variety of roles, ranging from providing basic ethnographic description to designing and implementing research components that generated data critical to testing the proposed hypotheses. For example, findings from the census update, socioeconomic status, and sanitation and hygiene components all address core research concerns of the Nutrition CRSP. Project colleagues saw anthropologists' collection of such data as a well-defined, comprehensible, and valuable contribution.

Sometimes, however, the roles of social scientists require clarification vis-à-vis the nature of the cross-disciplinary research. On the Kenya project, for example, anthropologists also contributed research priorities and methods that, at least at first, were unfamiliar to the other scientists. This was the case with anthropological interest in contextualizing food consumption within the broader economic system by focusing on agricultural production. However, this focus made it possible to relate particular food- and cash-crop production strategies to the project's detailed food-intake data—an exercise of obvious relevance to the work of nutrition scientists. Equally relevant for the work of social scientists in international agricultural development are the methods used to collect production data and the benefits of combining measured production with the recall data of such instruments as AG CROP.

No other Nutrition CRSP research component better illustrates the value of anthropological input than the Kenya project's time allocation study. It not only provided data for testing proposed hypotheses, but it generated new

hypotheses, along with the data needed to test them. Moreover, this research embodied the essential holism of the anthropological perspective. The time allocation study did not a priori define what activities would be important; rather, it recorded what was observed and then used these observations to construct an ethnographically appropriate coding framework. Working within their disciplinary norm of holism, anthropologists obtained the quantitative behavioral data that their nutrition-scientist colleagues required for focused hypothesis testing.

This work also had payoffs for anthropology as a discipline. Time allocation has only recently received wide recognition as an important research topic. Its methodology offers a number of advantages over more traditional recall, diary, and continuous observations techniques: it is a highly efficient way to gather information; it does not influence the behavior of the target individual; and it records data in a format that is easily computerized. Perhaps more importantly, when employed by well-trained and supervised field staff, it yields highly reliable results since in most cases the results are based on actual observation. However, anthropological work in this realm is still in an early stage of development, and researchers are experimenting with various methodologies for collecting time-use data (Gross 1984). Anthropologists on the Kenya project have made some significant refinements and additions to applying the technique under "real world" field conditions.

To conclude, the major contribution of anthropologists on the Kenya project was to place the nutrition sciences' target individuals (mothers, infants, toddlers, etc.) as actors within a larger sociocultural context so as to address the CRSP hypotheses' focus on the complex interrelations between biological and social environments. The task of the anthropologist on such interdisciplinary projects is systematically to record the proximate sociocultural variables interacting with the nutritional and health status of target individuals. To do so, the anthropologist uses questionnaires and quantitative measurement techniques; equally important, she/he participates, observes, and learns from the people in the study. Nutrition CRSP anthropologists' application of their disciplinary tools and skills resulted in a wealth of information on the socioeconomic context of chronic mild-to-moderate malnutrition in Kenya. As analysis progresses, this information will help researchers better understand the causes and consequences of such malnutrition, and generate workable responses to this debilitating malady in the Third World.

NOTES

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