ASSESSMENT OF THE EDUCATIONAL AND HEALTH IMPACTS

OF

THE MID DAY MEAL PROGRAM

Report Prepared for USAID/New Delhi

By

Richard L. Shortlidge, Jr.

A.I.D. - DS/ED

July 21, 1980

ASSESSMENT OF THE EDUCATIONAL AND HEALTH IMPACTS OF THE MID DAY MEAL PROGRAM

Section I

Introduction

This review of the Mid Day Meal Program's impact was undertaken at the request of USAID and the Government of India. Two general questions are addressed. First, how has the program benefitted children of primary school age? Second, what options in terms of further evaluation research might be conducted by USAID and the Government of India to more definitely isolate and measure the impacts of the program?

Section II

Review of the Evidence on Program Impact

Over the years since independence, India has made remarkable progress toward the achievement of universal primary school education. At the time of independence, less than half the children of primary school age were enrolled in school. By the mid 1970's, the proportion had risen to over 80 percent. Several states such as Assam, Kerala, Manipur, Meghalaya, Nagaland, and Tamil Nadu had already achieved universal primary school enrollment.

Despite this progress, major problems remain. The enrollment rate of girls continues to lag substantially behind that of boys. In fact between the mid 1960's and the mid 1970's, there was hardly any overall increase in the proportion of girls enrolled in primary school. In some states, such as Andhra Pradesh and Karnataka the enrollment rate of girls actually declined. The enrollment rates among scheduled castes and tribes continue to be significantly less than those of more economically and socially advantaged groups.

In order to achieve its objective of universal primary education, the Government of India has focussed its attention on overcoming the economic, social, and attitudinal barriers preventing an increase in the enrollment of girls and children from scheduled castes and tribes. The Mid Day Meal Program initiated in the 1960's is one of several programs designed to increase the enrollment of scheduled castes and tribes. Other programs address teacher training, curriculum, learning materials and educational cost and financing.

Conceptual Framework for Review

Two major assumptions underlie the conceptual framework for this assessment. First, formal education has a significant and positive impact on economic and social development. Numerous research studies on the relationship between education and economic development in India provide ample evidence for accepting this assumption as valid. For example, recent studies of India's growth rate in the 1960's indicate that nearly one-third is accounted for by India's investments in education, particularly basic education, in the 1950's. Rates of return analyses of investments in physical and human capital in India consistently show higher returns on investments in primary education than physical capital. Second, improving the acquisition and retention of knowledge and skills through formal education positively affects the development of human resources. The relationship between changes in the learning process and qualitative changes in a country's human resources is less well understood. While it is assumed that interventions such as improved teachers, qualifications, textbooks, and curricula have beneficial effects on learning and ultimately on human resource development, these interrelationships are less well defined and understood. Thus, the evidence on the importance of education to development is fairly persuasive. Yet, how development is affected by qualitative and quantitative changes in the mix of educational inputs or by altering the process or the delivery of education is less certain.

Within this conceptual framework, the Mid Day Meal Program may be viewed as an intervention which affects education in several ways. First, through its impact on school enrollment and attendance, the program may act as an incentive to attract disadvantaged children to school and to keep them there. Second, by improving health status, it may enhance academic performance. Poor nutritional and health status can impair learning. If the Mid Day Meal Program significantly augments the caloric and protein intakes of malnourished children, it may increase their ability to learn at school. Third, children who attend school more regularly might be expected to perform better in school. Thus, by reducing the number of days absent due to illness or other causes, the program may increase academic performance. Fourth, as a consumer of scarce monetary and non-monetary resources, the program has implications for the overall efficiency of primary education. Therefore, its benefits relative to costs should be examined vis-a-vis those of other interventions such as textbooks and teacher training to ensure that the resources allocated to primary education are effectively and efficiently utilized.

These possible ways in which the program might affect primary education can be formulated into six testable hypotheses which are the basis of this review. The hypotheses are stated below.

1. The Mid Day Meal program increases significantly the school enrollment or participation rate of children from disadvantaged communities.

2. The Mid Day Meal program increases significantly the school attendance rate of children from disadvantaged communities.

3. The Mid Day Meal program reduces significantly the dropout and repetition rates of children from disadvantaged communities.

4. The Mid Day Meal program increases significantly the academic performance or learning ability of children from disadvantaged communities.

5. The Mid Day Meal program increases significantly the nutritional and health status of children from disadvantaged communities.

6. The Mid Day Meal program enhances the efficiency and cost-effectiveness of primary education.

The evidence in support of each of these hypotheses is drawn from five quantitative evaluation studies. They are:

1. Prodipto Roy and K.G. Krishnamurthy, Evaluation of Mid Day Meal Programme: Pilot Study Andhra Pradesh (New Delhi: Council for Social Development, 1969);

2. Prodipto Roy and Radha Nath Rath, School Lunch in Orissa (New Delhi: Council for Social Development, 1972);

3. C.R. Soman, The Impact of School Lunches on the Nutritional Status of Children of Kerala: Preliminary Report (CARE: Kerala, 1976);

4. School Feeding in Karnataka: Impact on Enrollment and Attendance (CARE: India, 1977; and

5. Sneh Rewal, et al., Mid Day Meals Programme in Madhya Pradesh (CARE: India, 1979).

This list does not exhaust the evaluative and other materials on the school feeding program. The purpose of this assessment was to examine the quantitative impacts of the program. Therefore, qualitative evaluations such as the Community Systems Foundation's report on the PL 480 Title II Program in India completed in 1979 were excluded. Furthermore, CARE has over the years conducted a number of reviews on the efficiency of the program's operation. These have examined the shipment of food commodities, processing, storage, distribution, and the relationship between school days and feeding days. While these reports are invaluable tools to improve the management and operation of the program, they do not generally examine the impacts of the program on the intended beneficiaries.

The evidence in support of each hypothesis is critically assessed and evaluated. In a number of cases, the conclusions reached in this report contradict those found in the reviewed materials. In each of these cases both positions are presented along with the justification for not accepting the study's conclusion. The validity of a study's conclusions are evaluated in terms of the nature of its sample, the relevance of its statistical tests and the logic of the argument. Table 1 presents a summary of the evidence in support of each of these hypotheses.

First Hypothesis: Increases the School Enrollment Rate

One of the most frequently cited reasons for supporting the Mid Day Meal Program is its impact on the enrollment of disadvantaged children in school. It is astonishing that this relationship has never been analyzed.

This oversight results from the sample designs used in each of the studies. The school and the children in the school are sampled. By focusing on children who are already enrolled in school it is impossible to ascertain how the school enrollment rate, which is the proportion of children of school age enrolled in school, is affected by the Mid Day Meal program.

While most of the studies simply did not address the question of enrollment rates, the Orissa study erroneously concludes that larger increases in enrollment in Mid Day Meal schools than schools without a feeding program indicates a higher enrollment rate in schools with the lunch program. However, in the absence of knowledge about the respective school age populations, it is virtually impossible to draw this conclusion.

Second Hypothesis: Increases the School Attendance Rate

All of the studies, with the exception of Kerala, examined the impact of the feeding program on attendance. They conclude that the program has had a positive impact on school attendance. However, only two, Orissa and Karnataka, arrive at this conclusion with sufficient supporting evidence.

In Orissa, tribal and nontribal schools were analyzed. In non-tribal areas, no difference was found in the attendance rates of children in Mid Day Meal and Non-Mid Day Meal schools. In tribal areas, the schools in the feeding program tended to have higher rates of attendance. At the lower primary level (Grades I through III), the schools with the feeding program had an attendance rate of 60% compared to 57% for schools without one. For upper primary schools (Grades I through V), the comparative percentages were 66% and 52% respectively.

The absence of any difference in attendance rates for schools in non-tribal areas may be explained by the lower proportion of students from disadvantaged families in these schools. Also, average attendance rates in non-tribal schools are significantly higher than the rates for tribal schools suggesting that factors other than the feeding program are operating to increase attendance.

The Orissa study also analyzed absentee data. Children in MDM schools had a median number of days absent over a two-month period of 4.9 days compared to 6.4 days for children in non-MDM schools. Although significant, the difference is small.

TABLE I - COMPARISON OF FINDINGS ON THE IMPACTS OF THE MID DAY MEAL PROGRAM IN FIVE STATES OF INDIA

State Program Studied	HYPOTHESIS TESTED
	First Hypothesis: Increases the School Participation or Enrollment Rate (Percent of children of specific age group enrolled in School)
ANDHRA PRADESH (1969)	Not Examined
ORISSA (1972)	Not Examined
KERALA (1976)	Not Examined
KARNATAKA (1977)	Not Examined
MADHYA PRADESH (1979)	Not Examined
	Second Hypothesis: Increases the School Attendance Rate (Percent of enrolled children attending School)
ANDHRA PRADESH (1969)	Differences in attendance between MDM and non-MDM schools were compared by examining differences in the average number of days absent in the year as well as a two-month period for children in classes II and V. For the year, there was no significant difference in days absent for children in MDM and non-MDM schools. However, the two-month comparison indicated that boys in class II enrolled in MDM schools had a significantly lower number of days absent than boys in class II non-MDM schools. Yet since no difference was found among girls in either class II or class V, and between boys in class V for the two time periods, it seems reasonable to conclude that this small but significant difference between class II boys is the result of something other than the MDM program.
ORISSA (1972)	Both larger average class size and number of disadvantaged children in MDM than non-MDM schools were cited as evidence that the MDM program attracts more children from disadvantaged communities to school. However, it is impossible to draw this conclusion on the basis of the evidence presented. First, MDM schools tended to be bigger schools than non-MDM schools. Therefore, it is reasonable to expect that they would have larger class sizes. Second, MDM schools were located in communities with a greater proportion of families from disadvantaged communities. Therefore, even with the same probability of attending school for disadvantaged children served by either a MDM or non-MDM school, the MDM schools on average would have a greater enrollment of disadvantaged children. Thus, factors other than the existence of the MDM program provide an equally valid explanation of these observed differences. The evidence on attendance suggests that in tribal schools the feeding program has a positive impact on attendance for both lower primary schools and upper primary schools. For lower primary schools, the attendance in MDM schools is 60% compared to 57% in non-MDM schools. For upper primary the figures are 66% and 52% respectively.

KERALA (1976)	Not Examined
KARNATAKA (1977)	The month-wise variations in enrollment and attendance rates tended to be significantly less in MDM than non-MDM schools. These findings suggest that the MDM program leads to a greater stability in enrollment and attendance over the school year. Although the attendance rate was significantly higher for MDM schools than non-MDM schools, the difference was small--71.3% compared to 67.9%. However, an eleven point difference was observed for class I when high-efficiency MDM-schools were compared with non-MDM schools. Therefore, the differences observed were largely accounted for by high-efficiency MDM schools since there were little differences between low-efficiency MDM schools and non-MDM schools.
MADHYA PRADESH (1979)	Seemingly contradictory evidence was presented on the relationship between the MDM program and school attendance. Low efficiency MDM schools had higher attendance rates than high-efficiency MDM schools (67% vs. 60%). This finding was contradicted, in part, by the regression analysis in which number of days present in school was found to be significantly and positively related to number of months of participation in the MDM program. No significant difference was found between days present and program efficiency. It is impossible to use these results to prove that participation in the MDM program improves attendance for the following reasons. First, low efficiency MDM schools had proportionately more children of upper caste with better educated parents than high efficiency MDM schools. Since education of the father was a significant and equation explaining number of school days present and the efficiency variable is not significant, it is reasonable to conclude that the higher attendance rate (67% as opposed to 60%) for low efficiency schools is the result primarily of differences in the socio-economic backgrounds of the children in the two types of schools. Second, from an analysis of the relationship between grade-level and attendance rates, it was observed that as the grade-level of the child increased so did his attendance rate. Since the regression equation explaining days present does not control for the child's class, the months of participation in the MDM program acts as a proxy for grade level.

Third Hypothesis: Reduces the Drop-out and Repetition Rates

ANDHRA PRADESH (1969)

The study compared the class by class distribution of students in MDM and non-MDM schools and found significant differences in the distribution of students between MDM and non-MDM schools. On the basis of this finding, the erroneous conclusion was drawn that the drop-out rate in MDM schools was significantly lower than non-MDM schools. At any given moment in time, a class-wise comparison of enrollments is a very poor indicator of the attrition of children from school over time. Although the chi-square was significant in this comparison, the differences between the expected values and the actual values for the two distributions were largely the function of extreme differences in one or two cells of the two by five matrix (two types of schools, MDM and non-MDM, and five grades). Since the chi-square is the sum of the squares of these differences, a significant Chi-square can result from a big difference in only one or two cells. Since there is no consistent pattern in these differences which may be explained by the existence of the MDM program, it would be better to conclude that the evidence presented did not permit a valid test of the relationship between the MDM program and the drop-out rate. Repetition rates were not analyzed.

ORISSA (1972)

Two indicators were used to explore differences in drop-out rates. The first was the proportion of students in each class who dropped out of school in 1969. In all cases, except class II, the proportion of children dropping out was higher in MDM than non-MDM schools. However, none of the observed differences were significant. The second was a retrospective analysis of the five classes enrolled as of November 1969 which compared their enrollments in 1969 with their November enrollments in each previous year until the year they started class I. The proportion of children who continued their education appeared higher for MDM than non-MDM schools. However, the differences were unlikely to be significant. Thus, neither indicator showed any significant difference in the attrition rates of MDM and non-MDM schools. Repetition rates were not analyzed.

KERALA (1976)

Not Examined

KARNATAKA (1977)

Not Examined

MADHYA PRADESH (1979)

The relationships between the MDM program and either the drop-out or repetition rates were not analyzed in this study. Only the overall drop-out rate was given. In the schools surveyed, only 35% of the children enrolled in class I ever reached class V.

Fourth Hypothesis: Improves Academic Performance

ANDHRA PRADESH (1969)

Three types of tests were used to attempt to capture differences in the academic performances of children in classes II and V in MDM and non-MDM schools. The tests were an intelligence test, digit span test, and the mark on the final examination. For both class II and class V on at least one of these tests, children in non-MDM schools performed significantly better than children in MDM schools. However, since there was little consistency in these findings, it seems reasonable to conclude that there was no meaningful difference between MDM and non-MDM schools.

ORISSA (1972)

Differences in rates of failure on the final examinations were compared. However, there was no significant difference in the failure rates of children in MDM schools and those in non-MDM schools.

KERALA (1976)

Not Examined

KARNATAKA (1977)

Not Examined

MADHYA PRADESH (1979)

Not Examined

Fifth Hypothesis: Improves Health Status

ANDHRA PRADESH (1969)

When the heights and weights of children enrolled in class II and class V in MDM and non-MDM schools were analyzed, no significant difference was found between them. Furthermore, when caloric and protein intakes were compared, there was no difference between grade II students. However, for grade V boys, protein and caloric consumption was significantly higher in non-MDM than MDM schools. Yet since children in both types of school were consuming more protein and calories than in the recommended daily allowance for Indian children, it was not surprising to find them similar in terms of height-and weight-for-age.

ORISSA (1972)

Although there was significant and positive correlations between number of feeding days in MDM schools and both grams of protein and number of calories consumed, there was no significant difference in the health statuses of children in MDM schools and those in non-MDM schools.

KERALA (1976)

On the basis of a rough preliminary analysis of the anthropometric data on children in MDM and non-MDM schools, it was concluded that no significant difference existed in the health statuses of children. In this preliminary analysis, no attempt was made to control for differences in socio-economic status and family demographic characteristics. A more complex analysis with these controls was to be carried out.

MADHYA PRADESH (1979) Three measures of health status were compared - weight for age, height for age, and weight for height. The comparison was made for schools in the MDM program according to their level of program efficiency (percent of actual school days on which children were fed). While children in low efficiency schools tended to be significantly shorter and weigh less than children in high efficiency schools, these differences were not dramatic. The most persuasive evidence of a link between the MDM program and health status was the regression analysis explaining percent weight-for-height as a function of sex, family type, land holding, education of mother, education of father, home caloric intake, months of participation in the MDM program, and program efficiency. In this equation, four variables were found to significantly affect weight-for-height family,land-holding, months of participation and program efficiency. Of these four, the two most important were months of participation in the MDM program and program efficiency. While in both cases the impact was positive, it was not striking. For example, each one-month increase in participation in the program increased weight-for height by .146 and a one percent increase in program efficiency increased weight-for height by .066. In the analysis, the regression equations for weight-for-age, height-for-age, and weight-for-height were improperly specified, because of the omission of both age and grade in school. Extent of wastage and stunting tended to increase with age. Months of participation is a proxy for grade. Healthier children tended to remain longer in school. Thus, there was no way to differentiate between the impact of months in program and grade level. Since program efficiency remains significant, it appears that higher effieicncy schools do impact on weight. However, differences in health status did not affect attendance. Therefore, there doesn't seem to be an impact on educational objectives.

Sixth Hypothesis: Enhances Cost-Effectiveness

ANDHRA PRADESH (1969) Not Examined

ORISSA (1972) Not Examined

KERALA (1976) Not Examined

KARNATAKA (1977) Not Examined

MADHYA PRADESH (1979) Not Examined

The Karnataka study found that month-by-month variations in enrollment levels and attendance rates tended to be significantly less in schools with a feeding program than those without one. This argues that the availability of a free lunch stabilizes attendance over the course of the academic year. On average, however, the differences in attendance rates between schools with and without the lunch program were not dramatic, 71.3% compared to 67.9%. The greatest difference was observed for Class I when schools with a high-efficiency program (top 25% of schools in terms of proportion commodities required delivered to the schools within the block) were compared with those without a program. In this case, there was an 11 percentage point difference in attendance rates of Class I students.

While the Andhra Pradesh study concludes that the feeding program has had a positive impact on attendance, the evidence is extremely meager. For boys and girls in classes II and V, days absent over the year and for a two-month period are compared. Only in the case of Class II boys for the two-month period was there a significantly lower average number of days absent for children in the feeding program than for children in schools outside the program. Since no difference was found for girls in Classes II and V and for boys in Class V for either time period as well as for Class II boys over the year, it is difficult to argue persuasively that the program has significantly increased attendance.

The Madhya Pradesh study contained potentially the most rigorous test of the program's impact on attendance - measured by number of days present in the school during a six-month period. In a linear multiple regression analysis, days present was hypothesized to be a function of the child's sex, family structure, education of the father, size of land holding, home caloric intake, months of participation in the feeding program, and the program's level of efficiency as measured by the proportion of school days on which feeding occurred. In this analysis, months of participation in the program turned out to be the most important predictor of days of school attendance. Even so, its impact was not large. For example, it took approximately seven months of participation in the program to increase school attendance by a single day.

Unfortunately the failure to include the child's grade level and age makes it impossible to conclude that the program has a significant, albeit small, impact on attendance. From data presented elsewhere in the report, it is noted that days of attendance tended to vary directly with the grade level. That is, the higher the grade level of the child, the greater was the number of days of school attended. Since the variable months of participation in the feeding program varies directly with grade level, it is impossible in the analysis to discern whether the months of participation variable is acting as a proxy for grade level or is measuring the true association between the program and attendance.

To explore this bias, CARE reran the equation introducing age as an additional explanatory variable. The four most important variables were, in descending order of importance, months of participation, age, father's education, and home caloric intake. Age was inversely related to days present.

The importance of months of participation increased. Since there was virtually no variation in months of participation, once grade level is controlled, it is impossible to attribute the significance of this variable to the success of the feeding program. From data presented elsewhere in the report, it would seem more reasonable to conclude that this variable is picking up the fact that children in Class V are likely to attend more days of school than children in Class I. This explanation is also more consistent with the findings in the Karnataka and Andhra Pradesh studies where the program appears to have a greater impact on attendance among the lower primary grades.

In conclusion, the evidence from the five studies lends little support for a strong relationship between increasing school attendance and the presence of the school feeding program. Thus, while the program appears to have increased attendance rates, reduced absentee rates, and stabilized the month-to-month variation in attendance and enrollment, particularly among the lower primary grades, these impacts, even though significant, are extremely small.

Third Hypothesis: Reduces the Drop-out and Repetition Rates

Drop-out rates were studied only in the cases of Andhra Pradesh and Orissa. None of the studies explored repetition rates.

The failure to distinguish between drop-outs and repeaters complicates the analysis of drop-out rates. Since repetition rates often vary directly with grade level, they tend to inflate enrollment levels. If repeaters are not controlled for in an analysis of drop-outs, the estimated drop-out rate may significantly underestimate the actual rate.

The Andhra Pradesh study attempted to draw inferences about the school attrition rate from comparisons of average class sizes by grade level at a single point in time. However, since this compared different cohorts of children rather than the same cohort of children as they progressed through the school system, it is impossible to come to any conclusion regarding their rates of attrition from school unless the initial sizes of each of the cohorts enrolled in the school were exactly the same when they entered Class I and the factors affecting the probability of continuing in school acted equally on each cohort. These conditions are extremely unlikely to hold in this case.

Two indicators of drop-out rates were relied upon in the Orissa study. The first was the proportion of children in each class who dropped out of school in 1969. There was no significant difference between children in schools with a feeding program and those in schools without one. The second was a retrospective analysis of each of the five grades enrolled as of November 1969 comparing their enrollments in 1969 with their November enrollments in each previous year until they started school in Class I. Again there was no significant difference between MDM and non-MDM schools

Since three of the five studies failed to analyze the drop-out rate, and there were methodological problems in the two which did, it seems reasonable to consider that there is insufficient information to make any reasonable judgment about the feeding program's impact on the probability a child will continue in school and advance to the next higher grade level.

Fourth Hypothesis: Improves Academic Performance

The relationship between the MDM program and academic performance was explored in the Andhra Pradesh and Orissa studies. Three different tests were used in the Andhra study to assess ability and learning. In general, there was no significant difference between children in schools with the feeding program and those without it. Differences in final examination failure rates were compared in Orissa. Similarly, no significant difference between the two types of schools was found.

Although this hypothesis has not been adequately analyzed to date, it is unlikely that the feeding program would have an impact on school performance unless at least one of two conditions was met. First, the program would have to significantly improve a child's health by reducing the incidence of illness and disease and lessening the debilitating effects of hunger on learning. Second, the program would have to increase the number of days of attendance in school sufficiently to impact positively on school performance.

Little is known about the relationship between the incidence of disease or illness and learning. Yet it seems reasonable that the incidence would have to be reduced by more than a couple of days a month to have any measurable impact on academic performance. * A finding, as in Orissa, that the median days absent in school for a two-month period was 4.9 days for MDM schools and 6.4 days for non-MDM schools, is unlikely to make a difference.

In support of this, the Orissa study found that per capita protein and caloric intakes were not significantly correlated with absences due to illness. Furthermore, there was no significant correlation between the percent marks obtained on the examination and either total days absent or absences due to illness.

However, it should be remembered that, on average, children in the Orissa study were well fed. The average child, regardless of whether or not in the MDM program, was consuming calories and proteins at or above the recommended daily allowance for Indian children of the same age.

---

* Vitamin and mineral deficiencies may be more likely to affect learning behavior in this age group. For example, anemia is known to impact adversely on attention spans, since a child with anemia is less able to concentrate. It may well be that a program to overcome these deficiencies might be a cheaper and more effective health intervention for school-age children than a feeding program.

Fifth Hypothesis: Improves Health Status

The connection between improved health status and the school feeding program is one of the most frequently studied. Of the five studies reviewed, only the Karnataka study did not explore this relationship.

Health status was evaluated in these studies by anthropometric measures such as weight, height, chest circumference, upper arm circumference, skinfold at the biceps, and skinfold at the subscapula. In general, these studies found little relationship between participation in the feeding program and these anthropometric measures.

This finding is not surprising for two reasons. First, in the cases of Andhra Pradesh and Orissa, the children were receiving adequate calories and proteins whether or not they ate lunch at school. Thus, the target population in the survey did not include a substantial number of children who were nutritionally disadvantaged. Second, for children in the age group 6-11, the food received represented a relatively small fraction of their recommended daily allowance when substitution, dilution of feeding portions, and number of feeding days in relation to number of days in a year are taken into account. Also, since the feeding portion did not vary directly with the age of the child, the percent of the recommended daily allowance of calories and proteins declined with the age of the child.

The evidence from the Madhya Pradesh study suggested that even a relatively small supplementation (average of 156 calories per day per year and 10 grams of protein per day per year)* could have a statistically significant effect on weight. For example, weight-for-age and weight-for-height increased with months of participation and the efficiency of the program. However, the magnitudes of both impacts were relatively small. In the case of months of participation the standardized regression coefficient was + .146. For program efficiency it was + .066. Whether this indicated an improvement in health status sufficient to affect learning objectives is doubtful.

There are two considerations which raise suspicion about the meaning of these significant relationships and how they should be interpreted. First, the regressions do not include age. Months of participation is likely to be picking up some of the effect of age. Age is inversely related to both percent height-for-age and weight-for-age. However, since the effect of months of participation is positive, its coefficient is underestimated by not having age in the equations. Rerunning the regressions with age confirms this. Second, recalling that months of participation did not vary independent of grade level, the variable is really a proxy for grade. It appears that once controlling for age, health status improves with grade level. It should be

---

* This figure was obtained by dividing the daily net average calories and proteins by two since the average number of feeding days in the year was equivalent to half the days in the year.

remembered that age and grade, although strongly intercorrelated (zero-order correlation .61), they are not identical. This reflects the fact that many children older than six or seven are in the lower primary grades. It appears that children with poor health status are more likely to drop out of school. Therefore, relative to children in grade I, children in grave V are healthier. Without variability in months of participation in the feeding program which is independent of grade, it is impossible to ascribe these health differences to the program. The regressions (weight-for-age, height-for-age, and weight-for-height) when age is introduced suggest that percent weight-for-age and weight-for-height does improve significantly as the efficiency of feeding program increases. However, given the lack of a significant zero-order correlation between the two measures of relative weight and days present, this improvement is unlikely to lead to increased attendance.

A major issue in all these analyses of the impact of the feeding program on health status and the impact of health status on school attendance, academic performance, and drop-out and repetition rates is the appropriateness of anthropometric measures as proxies for health status for children in the age group 6 to 11 years. While these measures are strongly related to mortality among infants and very young children, they are not good predictors of mortality among children of primary school age. It may be that a truer measure of current health status among primary school-age children is the frequency of occurrence of diseases and sicknesses. However, the way in which the school feeding program affects the incidence of disease and sickness and how this in turn impacts on educational outcomes has not been systematically and rigorously studied in India.

Sixth Hypothesis: Efficiency and Cost-Effectiveness

The evidence on the feeding program's impacts on measures of school efficiency such as improved attendance, reduced attrition, and better academic performance is, at worst, meager and inconclusive. At best, it suggests that the program has had a minimal impact on its principal objectives, which if compared to the costs of the program, represents an extremely ineffective and inefficient use of scarce resources.

In the five states for which impact evaluations exist, the current cost per beneficiary per year varied from a high of Rs. 101.00 in Karnataka to a low of Rs. 53.00 in Andhra Pradesh. The other states, Orissa, Kerala, and Madhya Pradesh had per beneficiary cost around Rs. 60.00 per year. Most of this cost was for food. If the food costs are subtracted from these figures, the per beneficiary costs per year were Rs. 10.40 in Karnataka, Rs. 9.50 in Andhra Pradesh, Rs. 8.10 in Orissa, Rs. 8.60 in Kerala, and Rs. 10.80 in Madhya Pradesh. Approximately half the food cost was borne by the PL 480 Title II, program and the other half by the central and state governments in India.

In India, the average state government in 1978/79 spent Rs. 164 per student to educate a child in primary school. Compared to this, an expenditure of Rs. 60 per year to feed a child in the Mid Day Meal Program

was sizeable, equivalent to over one-third the amount of educational resources expended on that child. If the monetary value of the food resources were available to improve the quality of primary education, it would increase the expenditures per child at the primary level by approximately Rs. 12.* While it may be argued that the food or commodity component would not be converted into funds to increase expenditures on primary education, this food is not a free good. It does have other uses such as feeding pregnant women and preschool children to which it could be put. Thus, it is very important that the benefits from the feeding program be weighed against alternative uses for these resources.

Section III

Recommendations for Additional Evaluations

Introduction

The lack of rigorous systematic evaluations of the school feeding program make it extremely difficult to draw any meaningful conclusions about the program's impacts on its key objectives. Thus, it would seem reasonable to propose a large-scale evaluation to fill this void. However, there are a couple of reasons to remain skeptical about the power of such evaluations to resolve the ambiguities surrounding the program's impacts.

First, the data to adequately identify the impacts are simply, for the most part, unavailable. The feeding program started in India nearly two decades ago. How it has affected attendance rates, health status, and academic performance will remain shrouded in darkness in the absence of baseline and longitudinal data.

Second, the feeding program is expensive relative to India's per student investment in primary education. The program would have to have had a fairly substantial impact on objectives such as enrollment and attendance to be cost-effective. The evaluation work to date does not make one sanguine about finding such evidence.

In deciding which of the evaluation options, if any, to accept, USAID and the Government of India should keep these caveats in mind. Three options are proposed. The first is a retrospective analysis of district level or block level educational data to examine how school enrollment rates have changed over the last two decades as a result of the feeding program and changes in educational and economic conditions. The second is a longitudinal analysis of the recently started feeding program in Maharashtra. The third is a cross-sectional analysis of the program in three states. Each of these options is described below.

Option One: Determinants of Changes in Primary Enrollment Rates Between 1961 and 1978

No evaluation has addressed the question of how the school feeding program has affected the primary school enrollment rate. Fortunately, it may be possible to answer this question by means of a retrospective analysis of historical data

---

* Only one in five primary school children are fed a free lunch in India. Spreading the feeding resources across all children enrolled in primary school would increase per student expenditures by Rs. 12.00 (Rs. 60.00/5)

India has a wealth of historical economic, social and educational data. Much of this data are disaggregated by blocks and districts, and are available from published sources such as the 1961 and 1971 Censuses as well as annual state and Government of India reports. They are also found in unpublished records maintained by various state ministries.

The retrospective analysis would explore the factors which have affected the block-level or district-level rates of growth in primary school enrollment over the period of time 1961 to 1978 and the contribution of the school feeding program to this growth. The base year 1961 is selected because of the vast amount of disaggregated socio-economic, demographic, and educational data available from the 1961 Census of India. Whether the final year is 1978 or some earlier year will depend on the availability of data. At the very least, an analysis could be undertaken of the changes between the 1961 and 1971 Censuses.

The analysis would hypothesize that the rate of growth in primary school enrollment rates is a function of the school feeding program, quantitative and qualitative changes in the availability of educational services, and economic and demographic changes. It is necessary to analyze the impact of the feeding program relative to other educational and economic changes in order to understand its relative importance in increasing enrollment rates and to control for the effects of variables which may have changed simultaneously with the growth of the feeding program.

The variables explaining the growth in primary school enrollment rates would include the following. The sign in parenthesis indicates the expected direction of the variables' effect.

1. Participation in the school feeding program as measured by:

   A. Growth in the proportion of schools participating in the program in the district or block, (+)

   B. Amount of time in months participating in the program, (+)

2. Educational Changes

   A. Qualitative changes

      1. Proportion of primary teachers trained in base year, (-)

      2. Change in the proportion of primary teachers who are trained, (+)

      3. Number of primary school students per teacher in the base year, (-)

      4. Changes in primary school student-teacher ratio, (+)

      5. Textbooks per primary school student in the base year, (-)

As proposed the regression analysis would consist of 28 independent variables. Twenty-four of these variables represent pairs like "student-teacher ratio in base year" and "change in student-teacher ratio." In analysis of change such as this, it is necessary to control for the base year condition, since the rate of change or the proportion change which occurs is affected by the base. For example, a change of 5 units from 10 to 15 represents a 50% increase whereas exactly the same absolute change from 50 to 55 represents a 10% increase. Therefore, the higher the primary school enrollment rate in the base year, the lower will be the expected proportional change. This explains the hypothesized negative coefficients on base year variables such as "proportion trained teachers" and "textbooks per student." Once the regression equation has been standardized for these conditions, the rate of change in these independent variables is expected to positively affect the rate of growth in enrollment.

The number of observations will be either 400 if districts are used or 5,000 if blocks are the unit of analysis. Given the number of independent variables in the equation, statistically more reliable results are likely with block rather than district data. However, it is not clear whether this increased reliability would be sufficient to overcome the additional time and energy required to collect the block-level data. District-level data are likely to be readily available from published sources available in New Delhi. On the other hand, the block-level data would probably have to be obtained from unpublished official records maintained by state governments.

As specified, the regression equation would yield evidence on the relative importance of several education interventions to increasing primary school enrollment. Comparing these impacts relative to their cost would enable the Government of India to determine the overall cost-effectiveness of the feeding program relative to other interventions.

The estimated budgets depending on whether the unit of observation is the district or the block are contained in tables 2 and 3. The total cost if restricted to districts would be Rs. 41,055 or U.S. $5,132 for a six-week study. The total cost if restricted to blocks would be Rs. 105,513 or U.S. $13,189. for a ten-week study.
(Note: To test the validity of this approach, a shorter model using state data could be used. This could be done by USAID or GOI in about 2 weeks.)

6. Change in textbooks per student, (+)

7. Expenditure per primary student in base year, (-)

8. Change in expenditure per primary student, (+)

B. Quantitative Changes

1. Number of primary schools per child of school age in base year, (-)

2. Change in primary schools per child, (+)

3. Proportion of primary schools with required number of grades in base year, (-)

4. Change in proportion of primary schools with required number of grades, (+)

C. Access to higher-level education

1. Number of secondary schools per child of secondary schools age in base year, (-)

2. Change in number of secondary schools per child of secondary school age, (+)

D. Access to information and knowledge

1. Radios per capita in base year, (-)

2. Changes in radios per capita, (+)

3. Newspapers per capita in base year, (-)

4. Changes in newspapers per capita, (+)

5. Village level workers per capita, (-)

6. Changes in village level workers per capita, (+)

3. Economic, social, and demographic factors

A. Population growth rate over period, (-)

B. Percent of population in base year from scheduled castes and tribes, (-)

C. Per capita income in base year, (-)

D. Changes in per capita income, (+)

E. Infant mortality rate in base year, (-)

F. Changes in infant mortality rate, (+)

Table 2

Budget Option I (District Data)

	Rs. Cost
Staff	
1. Senior Research Analyst (6 weeks @ Rs. 6,000/p.m.)	9,000
2 Research Assistants	9,000
1 Statistician/Computer Programmer (6 weeks @ Rs. 4,000/p.m.)	6,000
1 Secretary (2 weeks @ Rs. 2,000/p.m.)	1,000
Travel	
4 trips to collect data from state capitals (Figure on 2-day trips Delhi/Hyderabad, A.P.)	8,000
Data Processing	
Computer Time (2.5 hours)	2,500
Key punching (2 cards per district = 800 @ Rs. 200 per 1,000 cards	200
Contingency and Misc.	35,700
Figure 15% total cost above	5,355
TOTAL Rs.	41,055
(US $	5,132)

(Rs. 8.00 = US $ 1.00)

Table 3

Budget Option I (Block Level Data)

	Rs. Cost
Staff	
1 Senior Research Analyst (10 weeks @ Rs. 6,000/p.m.)	15,000
4 Research Assistants (10 weeks @ 3,000/p.m.)	30,000
1 Statistician/Computer Programmer (10 weeks @ Rs. 4,000/p.m.)	10,000
1 Secretary (2 weeks @ Rs. 2,000/p.m.)	1,000
Travel	
15 Trips to collect data from state capitals (Figure on 2-day trips Delhi/Hyderabad, A.P.)	30,000
Data Processing	
Computer Time (3.75 hours @ Rs. 1,000 per hour)	3,750
Key Punching (2 cards per block = 10,000) @ Rs. 200 per 1,000 cards	2,000
Contingency and Misc.	91,750
Figure 15% total cost above	13,763
TOTAL Rs.	105,513
(US $	13,189)

(Rs. 8.00 = US $ 1.00)

Option II: Longitudinal Analysis of School Feeding Program in Maharashtra (3-year study)

At the beginning of the 1979-80 school year in Maharashtra, CARE launched a new school feeding program in 14 rural districts. In its first year, the program reached 197,242 children. Even though the program has been in operation for a little more than a year, its relative "youth" provides a unique opportunity to test the impact of the program on educational and health objectives such as:

1. Increased enrollment rates
2. Increased attendance rates
3. Reduced drop-out and repetition rates
4. Improved academic performance
5. Improved health status
6. Cost-effectiveness and efficiency

Conceptual Framework

These impacts would be studied by means of a three-year longitudinal research project. Data for the analysis would be obtained from a large-scale household survey in which each household would be interviewed at two points in time. Since the study focuses on the decision process surrounding sending children to school and keeping them there, only households with children of primary school age or with children just about ready to enter school would be included.

It is hypothesized that the family makes not one but several decisions regarding the education of their children. Initially the family must decide which among their children will enroll or not enroll in school. After the child is in school, the decision-making process focuses on whether to continue the child's education. The way in which various factors affect this decision are likely to change as the child gets older. For example, a six-year old male child enrolled in Class I is less likely to be needed to help around the house or on the farm than an eleven year old male child enrolled in Class V. Circumstances which affect the opportunity cost of going to school will impact differently on these two children. For this reason, the analysis will examine the education decision-making process separately for children about to enter school, children in Class I, children in Class II, etc.

The decision to send children to school is hypothesized to be influenced by the family's demographic, social, and economic characteristics, the attributes of the child for whom the decision is being made, quantitative and qualitative aspects of the school, and community attitudes and views toward education. These same factors are likely to affect the decision to keep a

child in school. However, this latter decision will probably take into account additional considerations regarding the child's school performance and general attitudes toward education.

It is within this complex decision-making process that the school feeding program operates. First, it acts as an incentive to send children to school and keep them there. Second, as an in-kind payment to attend school the program may be perceived as a form of income transfer. Thus, it augments the resources available to the family. However, in order to receive this transfer, the family must incur a cost in terms of the child's time which is unavailable for performing household chores while he is in school. As long as the "income" flow to the family is greater than the child's opportunity cost, the family will be likely to continue to keep the child in school. However, as the child gets older the income transfer effect of the program is likely to diminish. Third, the program may improve the child's health status by reducing the incidence of disease and sickness. By affecting the incidence of morbidity, the program may improve the academic performance of the child. Having healthier children may improve the family's attitudes toward education, as well, since the feeding occurs at school.

The various models to be tested in this analysis are outlined in Table 4. This table contains a description of the variables and their expected impact on school enrollment, attendance, performance, and retention as well as their expected impact on morbidity and change in morbidity status. Each model would be estimated using multiple regression analysis. The unit of analysis is the child.

Sample Design and Field Work

The sampling unit is to be rural households with at least one child of primary school age or within a year of being eligible to enroll in school. It is estimated that a sample of 3000 households would yield approximately 6,000 primary school age children. Approximately half the households would be from blocks with a feeding program. The others would be from similar blocks without it. If because of the spread of the program this proved impossible, blocks with varying levels of participation in the program would be chosen.

The information on children and the family would be gathered by means of a household questionnaire. The school data would be collected directly from the local primary school. The community information would be based on interviews with community leaders.

The field work would be carried out by 5 enumeration teams consisting of a team leader and 4 interviewers. The field work would occur at two points in time separated by one year. It is estimated that it would take one and one-half months per round of interviews. This assumes that each interviewer will be able to complete between two and three questionnaires a day.

...THESIZED RELATIONSHIP BETWEEN THE DEPENDENT & INDEPENDENT VARIABLES IN THE MAHARASHTRA LONGITUDINAL STUDY

...DENT VARIABLES	DEPENDENTS VARIABLES						
	First Time Enrollment Status (1=Enrolled, 0=No)	School Attendance Rate	Academic Per-formance	Change in Academic Per-formance	Continue in School (1=Remained 0=,dropout)	Morbidity (Days Sick)	Change in Morbidity (Improve)
...COMPOSITION							
...Joint=1,0=Nuclear)	+	+	0	0	+	?	?
...over 14 years (Base Year)	+	+	0	0	+	?	?
...r 14 years (Base Year)	+	+	0	0	+	?	?
...les over 14 years (1=Yes,0=No)	+	+	0	0	+	?	?
...les over 14 years (1=Yes,0=No)	-	-	0	0	-	?	?
...s over 14 years (1=Yes,0=No)	+	+	0	0	+	?	?
...s over 14 years (1=Yes,0=No)	-	-	0	0	-	?	?
... years (Base Year)	-	-	-	0	-	?	?
...dren under 5 years (1=Yes,0=No)	-	-	0	0	-	?	?
...dren under 5 years (1=Yes,0=No)	+	+	0	0	+	?	?
...MIC CHARACTERISTICS							
...ow)	-	-	-	-	-	+	-
...sehold	+	+	+	+	+	-	+
...ase Year)	+	+	+	+	+	-	+
...Family Income	+	+	+	+	+	-	+
...Family Income	-	-	-	-	-	+	-
...ults Economically Active(Base Year)	+	+	+	+	+	-	+
...tion of Adults Economically Active	-	-	-	-	-	+	-
...tion of Adults Economically Active	+	+	+	+	+	-	+
...tock Owned by Family (Base Year)	-	-	-	-	-	0	0
...ber of Livestock Owned by Family	+	+	+	+	+	0	0
...ber of Livestock Owned by Family	-	-	-	-	-	0	0
...alment of Father	+	+	+	+	+	-	+
...alment of Mother	+	+	+	+	+	-	+

MISSING PAGE NO. 24

Table 4 (continued)

INDEPENDENT VARIABLES	DEPENDENTS VARIABLES						
	Enrollment Status	School Attendance Rate	Academic Performance	Change in Academic Performance	Continue in School	Morbidity	Change in Morbidity
Increase in textbooks per Student				+	+		
Decrease in textbooks per Student				-	-		
School's Participation Rate in Mid-Day Meal Program (Base Year)	+	+	+	+	+	-	+
School's Participation Rate Increased in Mid-Day Meal Program		+	+	+	+	-	+
School's Participation Rate Decreased in Mid-Day Meal Program		-	-	-	-	+	-
Trained Teacher (1-Yes, 0-No)	+	+	+	+	+		
Years of Education of Teacher	+	+	+	+	+		
COMMUNITY CHARACTERISTICS							
Village Leadership Actively Encourages Education (1-Yes, 0-No)	+	+	+	+	+		
Community Involved in School (1-Yes, 0-No)	+	+	+	+	+		
Community Involved in Self-Help Schemes (1-Yes, 0-No)	+	+	+	+	+		
Frequency of Contact Village Level Workers	+	+	+	+	+		

Final Products

Rather than one final report, a series of special reports are envisaged. These reports would be devoted to topics like school enrollment, school attendance, academic performance, and school attrition. While they would be oriented toward the impact of the school feeding program on educational and health objectives, they would compare the school feeding program to other factors such as teacher training, textbooks, and classroom size. It is important that the school feeding program be reviewed as one of several means to improve education. One special report would be a comprehensive analysis of the cost-effectiveness of the Mid Day Meal program vis-a-vis other alternatives such as increasing access to textbooks and improvement in teacher qualifications.

Cost

The estimated cost of this option is Rs. 1,665,315 or U.S. $ 208,164 The time required to complete the analysis is three years. See table 5 for the cost breakdown.

Table 5

Budget Option II

(3 year Longitudinal Study)

	Rs. Cost
Staff	
Management	
1 Research Project Manager (18 months @ Rs. 8,000 per month)	144,000
1 Administrative Assistant (18 months @ Rs. 2,000 per month)	36,000
Professional	
1 Senior Education Research Analyst (18 months @ Rs. 6,000 per month)	108,000
1 Senior Health Research Analyst (18 months @ Rs. 6,000 per month)	108,000
1 Senior Economic Research Analyst (18 months @ Rs. 6,000 per month)	108,000
1 Senior Statistician (18 months @ Rs. 6,000 per month)	108,000
Secretarial and Clerical	
2 Secretary/Typist (18 months @ Rs. 1,500 per month)	54,000
5 ecorders/Coders (3 months @ Rs. 1,000 per month)	15,000
Field	
5 Field Team Leaders (9 months @ Rs. 3,000 per month)	135,000
20 Enumerators or Interviewers (6 months @ Rs. 1,000 per month)	120,000

Table 5
(Cont.)

	Rs. Cost
Transportation, Travel, and Per Diem	
20 Round-trip Train Fares Delhi-Aurangabad	8,000
Per Diem for field 25-member research staff (90 days @ Rs. 150 per day)	337,500
5 Rented jeeps or other suitable vehicles (90 days @ Rs. 200 per day)	90,000
Data Processing and Analysis	
Coding and Key punching data for 3,000 households collected at two points in time (Estimated about 2 children per household and 8 cards per child = 48,000 cards) (Rs. 200/per 1,000 cards)	9,600
Computer Time (40 hours) (Rs. 1,000 per hour)	40,000
Other Cost	
Paper and other supplies	20,000
Printing two questionnaires for 3,000 households (total 6,000) (About 15 pages each)	2,000
Printing 10 60-page Special Research Reports (200 copies each)	5,000
	1,448,100
Contingency	
Figure 15% Total of Above	217,215
TOTAL	Rs. 1,665,315
	U.S.$ = 208,164)

(Rs. 8.00 = U.S. $1.00)

Option III: Cross-sectional Analysis of Mid Day Meal Program in Three States (Two-Year Study)

The final option is a cross-sectional study of the Mid Day Meal Program in three states. The states should represent varying lengths of time in the program. The justification for not selecting states with similar lengths of time is to test whether or not the annual incremental benefits diminish over time. For example, it may be that the program has its greatest impact on enrollment and attendance during its initial years of operation. While it still continues to exert a positive influence on enrollment and attendance over time, the magnitude of this positive influence declines.

Conceptual Framework

Option III proposes to use essentially the same program indicators that were relied upon in Option II. They may be stated as six hypotheses.

Hypothesis One: Children in villages with a free lunch program have a higher probability of enrolling in school than those in communities without the program, all else being equal.

Hypothesis Two: Children in villages with a free lunch program have a higher probability of attending school on a regular basis than children in communities without the program, all else being equal.

Hypothesis Three: Children in villages with a free lunch program have a lower probability of dropping out of school than children in communities without the program, all else being equal.

Hypothesis Four: Children in villages with a free lunch program are likely to perform better in school than children in communities without the program, all else being equal.

Hypothesis Five: Children in villages with a free lunch program are likely to be healthier than children in communities without the program, all else being equal.

Hypothesis Six: For the various education and health objectives above (hypotheses one through five), the school feeding program is one of the most cost-effective ways to achieve them.

Each of these hypotheses, with the exception of six, will be tested by means of a multiple regression analysis. Hypothesis six will be analyzed by comparing benefits and costs for several different interventions which might achieve the same objective as the school feeding program. For example, suppose after controlling for all other factors in the equation explaining school attendance rates for Class I it was found that textbooks increased attendance rates by 10% and the Mid Day Meal program increased attendance rates by 25%. Assume free textbooks could be provided Grade I students for Rs. 10.00 per child. The cost of the free lunch program per child in grade I, only the Indian cost, is Rs. 6.00. In this example, a rupee

invested in textbooks would increase school attendance by 1% whereas a rupee invested in the feeding program would increase attendance by 4.2%. In this hypothetical example, the feeding program is the most cost-effective. In this way, the cost-effectiveness of various options to increase enrollment, attendance, and academic performance and to reduce dropout and repetition rates would be explored.

The independent variables in the model would be similar to those in option II. However, since the survey will be undertaken at one point in time there will be no measures of change over time. The variables may be broadly divided into the demographic composition of the family, socio-economic characteristics of the family, attitudes of family, characteristics of the child, characteristics of local primary school, and community characteristics. Rather than repeat each variable here the reader should refer to the variable list in table 4.

As was the case in option II, the various hypotheses would be analyzed separately by class level. Thus the enrollment hypothesis would pertain to children entering school for the first time or re-entering after an interruption in their schooling. The attendance, attrition, and academic performance hypotheses would be examined individually for class I, II, III, IV, and V. In addition, the cost-effectiveness of various interventions will be pursued class by class.

Sample Design

Three states would be selected as indicated earlier. The total sample size will be around 5,000 rural households or 1,667 households per state. This is likely to yield a sample of 10,000 children in the age group of five to eleven.

The sampling unit will be households with a child of school age. On the other hand, the unit of analysis will be the child. This assumes that the decision to go to school is made separately for each child.

Final Product

As a result of the study, a series of special reports on each of the major hypotheses would be prepared. There would be reports on school enrollment, attendance, performance, and attrition as well as health status and cost-effectiveness.

Cost

The estimated total cost for this option is Rs. 1,160,638 or US $145,080. See table 6 for the budget details.

Table 6

Budget Option III

Study in Three States (2 years)

	Rs. Cost
Staff	
Management	
1 Research Project Manager (12 months @ Rs. 8,000 per month)	96,000
1 Administrative Assistant (12 months @ Rs. 2,000 per month)	24,000
Professional	
1 Senior Education Research Analyst (12 months @ Rs. 6,000 per month)	72,000
1 Senior Health Research Analyst (12 months @ Rs. 6,000 per month)	72,000
1 Senior Economic Research Analyst (12 months @ Rs. 6,000 per month)	72,000
1 Senior Statistician (12 months @ Rs. 6,000 per month)	72,000
Secretarial and Clerical	
2 Secretaries/Typist (12 months @ Rs. 1,500 per month)	36,000
5 Coders/Recorders (1.5 months @ Rs. 1,000 per month)	7,500
	451,500

Table 6
(Cont.)

	Rs. Cost
Field	
9 Field Team Leaders (3 teams per State) (2 months @ Rs. 3,000 per month)	54,000
36 Field Enumerators (3 Teams per State) (1.5 months @ Rs. 1,000 per month)	54,000
Per Diem for 45 field staff members in Rural Areas of Gujarat, Orissa, and Tamil Nadu (use an average) @ Rs. 150 per day	303,750
9 Rented jeeps or other suitable vehicles (45 days @ Rs. 200 per day)	81,000
Data Processing	
Coding and Key punching for 5,000 households estimated contain 2 children each 4 cards per child equals 40,000 cards @ Rs. 200 per 1,000 cards	8,000
Other Cost	
Paper and Other Supplies	20,000
Printing 5,000 copies of 15-page questionnaire	2,000
Printing 10 60-page Special Reports (200 copies each)	5,000
Contingency	
Figure 15% Total above	151,388
TOTAL	Rs.1,160,638

(U.S. $ = 145,080)