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# **NUTRITIONAL FUNCTIONAL CLASSIFICATION STUDY OF PERU:**

Who and Where are the Poor?

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**Who and Where are the Poor?**

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## **In Memoriam**

This work is based on the analytical methods known as "Functional Classification of Malnutrition" which were developed and promoted by our late friend and colleague, Dr. Victor Valverde. The approach reflects Dr. Valverde's special gift of applying rigorous and relevant analytical techniques to problems related to the fulfillment of the basic needs of the human population. We dedicate this humble effort to his memory; his premature death, while undertaking his professional mission represents the ultimate dedication to his search for an effective means of eradicating poverty and malnutrition.

## **Acknowledgements**

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## **Contents**

|   |    |
|---|----|
| Summary.....  | 1  |
| The Nutrition Problem in Peru .....                             | 4  |
| Food Consumption Aspects of the Nutritional<br>Problems .....   | 4  |
| Functional Classification Approach .....                        | 7  |
| Definitions of Functional Groups.....                           | 9  |
| Distribution of Nutritional Status by Functional<br>Group ..... | 12 |
| Socioeconomic Characteristics of the Functional<br>Groups.....  | 15 |
| Distribution of Malnutrition and the Functional<br>Groups.....  | 19 |
| Conclusions and Recommendations .....                           | 26 |
| Bibliography .....  | 30 |

## Summary

Regardless of how one defines malnutrition, in Peru during 1984 more than half of the rural households and many of the urban households had children whose body size classified them as malnourished or at risk of being malnourished. Perhaps more important than the classification itself is the fact that these households also suffered from other severe deprivations: crowded housing, poor sanitation, a lack of water, chronic or acute diseases, very low incomes and low levels of schooling for all their members. These new data from the 1984 National Nutrition and Health Survey confirm that Peru continues to suffer from a persistent problem of chronic malnutrition and poverty for a large proportion of its population.

The statistical evidence is overwhelming; in 1984, approximately 250,000 households in Peru were living under such precarious conditions that at least one of their children was in nutritional crisis and the factors associated with the syndrome of multiple deprivations known as malnutrition. Many of these children have most probably died since 1984. An additional 125,000 households had children whose nutritional status was considered severe, and more than an additional 365,000 households had children with chronic malnutrition. That is, three fourths of a million families lived in households having at least one malnourished child. **The number of children under six years of age with chronic malnutrition exceeded one million.**

Approximately sixty percent of the households with malnourished children were economically dependent on agricultural production and agricultural wage work for their livelihood. Their economic output in terms of product and labor effort was insufficient to provide them adequate diets, housing, sanitation, water or access to preventive and curative health services. Their poor health and diets, in turn, prevented them from participating more fully in the economic processes of the society. For the long run, the solution is to reverse (and perhaps compensate for) the long standing and continuing bias against agriculture and labor, particularly in the highlands. Such reversal of policy and of developmental strategy does not seem to be forthcoming, and even if it were, it would not solve the problems of the households whose conditions of extreme poverty would prevent their response to improved economic incentives. Direct nutritional interventions must be undertaken urgently to assist the households with severe malnutrition and in current

crisis conditions to improve the chances for survival of their children, to improve their current and future health, and to seek solutions to their dietary and income problems.

The priority groups which were defined by the analysis of the 1984 data were the day laborers and subsistence and small commercial farmers of the Sierra; the Southern and Central Sierra are the most pressing as are the problems in the highlands of Cajamarca and La Libertad Departments. There were also significant pockets of malnutrition and poverty in the Jungle. In these groups, 135,063 households had a child in a crisis situation which required immediate attention. Additionally, more than half of the households with children in crisis conditions in Peru belonged to these groups. The rural households in the priority groups urgently need community based assistance to :

1. Improve the dietary intake of all family members through:
  - a. the distribution of foods such as parboiled and precooked cereals, powdered milk, oil and fortified sugar for home consumption, and
  - b. increasing the production of locally produced foods, especially potatoes, for consumption at home.
2. The management of illnesses at the household level, particularly the care and feeding of children with diarrheal disease.
3. Improvement in the sanitation of the environment through the use of latrines, confining of animals, and by adding sleeping areas to the homes.
4. Improving the access to and the use of water resources for human consumption or for use in agriculture.
5. Enhancing child feeding practices as a supplement to breast feeding.
6. Promoting improved child spacing and maternal health in general.
7. Maintaining the coverage and currency of vaccinations against childhood diseases.

These actions must be taken in the context of very poor coverage and access to public services of all kinds. Accordingly, the households and their communities must be the principal providers of solutions for their nutritional problems. To reach these households with information, material resources and services, there will be a need to use existing institutions and to place higher reliance on the private sector, as well as schools, churches, the military, the police, agricultural intermediaries and traditional health providers, particularly in the Sierra and the Jungle. The provision of this specific assistance is not a substitute for neutralizing the anti rural bias in economic policy and the development strategy.

While the problems of the urban areas were not as pressing as those of the rural areas at the time of the survey in 1984, certain functional groups in the urban areas require specific assistance. In particular, construction workers, skilled and unskilled workers and the petty vendors need assistance from broad based programs in health and sanitation. In 1984, these urban groups represented approximately 23,501 households with a children in crisis situations and an additional 85,824 households with a severely stunted or chronically malnourished child.

In order to provide the assistance which is urgently needed to the households with a children in crisis situations, a major shift in the philosophy and deployment of the health system (public and private) and of the public service agricultural agencies will be required. Additional financial and commodity resources are also necessary to assist the private sector and the public sector in its reorientation and redeployment. Simultaneously, the biases in the structure of economic incentives must also be addressed. All of the above actions suggest a key role for USAID involvement at all levels: project, program and policy. The actions undertaken by USAID thus far in health, water and sanitation, food and feeding, and agricultural development have undoubtedly helped to improve the situation and to prevent more damage from the droughts and floods of the recent years. The proposed child survival program is a desperately needed initiative. It is hoped that its resources and other USAID resources can be used to strongly emphasize the need in the Sierra and the other rural areas because more than three times as many persons live under crisis conditions there than in the urban areas, and almost all indicators showed that **even the worst groups in the urban areas are better off than the best groups in the rural areas.**

## The Nutrition Problem in Peru

Malnutrition continues to be an important problem in Peru as evidenced by the fact that in 1984, almost one fourth of all of the households in Peru had important nutritional problems. In addition, at least 37 percent of the country's children under six years of age were affected by the growth retardation effects of malnutrition and 9 percent of preschoolers in the country were both underweight for their ages and severely stunted in height. In particular, in the rural population more than half (56 percent) of the preschool population were classified as stunted for their ages. As seen in figure 1, the highest prevalence of chronic malnutrition was found in the Sierra and the lowest prevalence of malnutrition was in the Coast and metropolitan Lima. Figure 2 shows that the proportion of malnourished preschoolers living in the Sierra represented more than half of the malnourished children in the country as a whole, despite the fact that the Sierra represented only a third of the preschool population of Peru. On the other hand the population of Lima was underrepresented among the malnourished—only 10.5 percent of the malnourished Peruvian population lived in Lima which as a metropolitan area represented more than 25 percent of the nation's preschoolers in 1984 (figure 2). Children living in the rural areas were approximately twice as likely to be chronically malnourished than were the children under six years of age who lived in urban areas. The relative risk of malnutrition was even greater between the Sierra preschoolers and the preschoolers residing in Lima—the **Sierra child was almost four times more likely to be malnourished than the Lima child** (INE, 1986).

This report describes a study which found that approximately 60 percent of the malnutrition in preschool children were clustered in functional groups economically connected to the agricultural sector. These nutritional problems were found to be associated with insufficient incomes to purchase adequate diets, inadequate diets, low levels of schooling for all members of the household, health and environmental variables such as poor housing quality, lack of access to safe water, poor sanitary conditions, and high levels of childhood morbidity from diarrheal disease.

### Food Consumption Aspects of the Nutritional Problems

In the past four decades, food availability in Peru appears to have been inadequate and the diversity of the diet has deteriorated. The level of available food energy has averaged less than 90 percent of 2,400 calories per day which is the level which the Food and Agriculture

Figure 1.

LOCATION OF HOUSEHOLDS WITH  
MALNOURISHED CHILDREN  
PERU, 1984

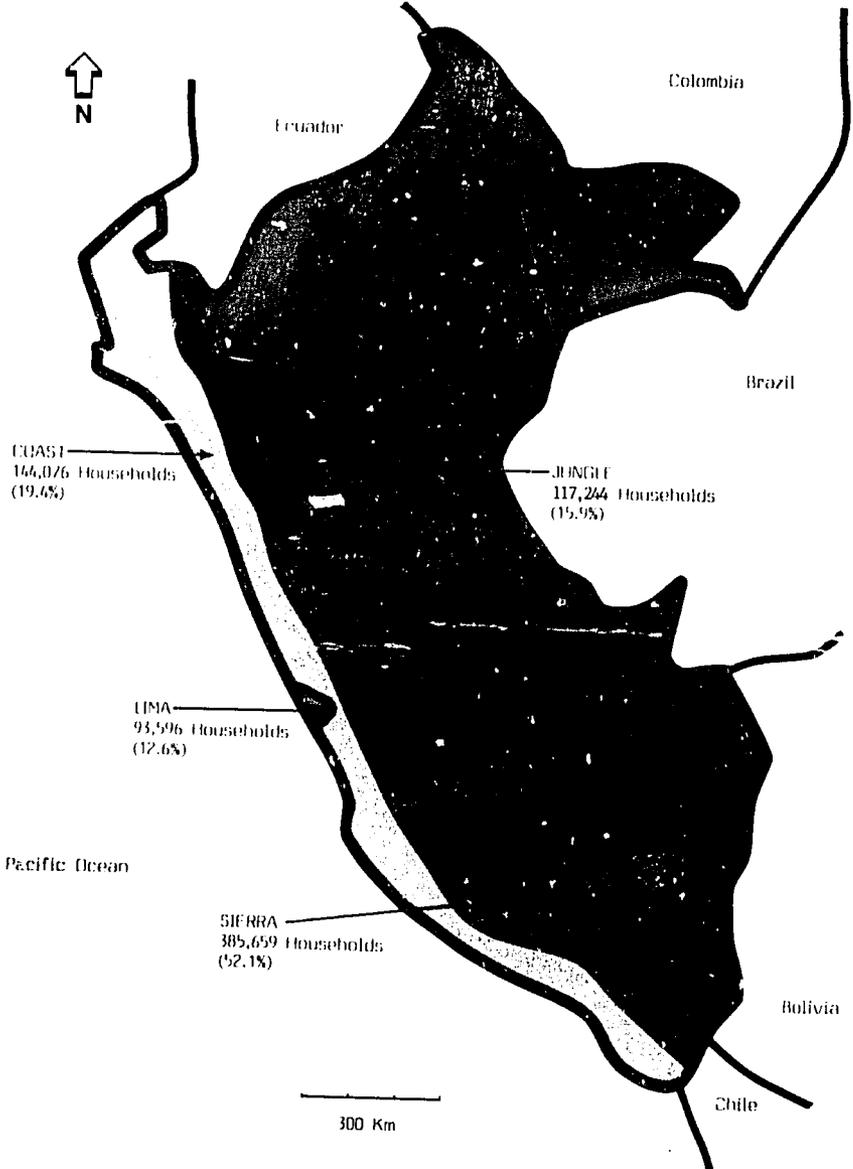
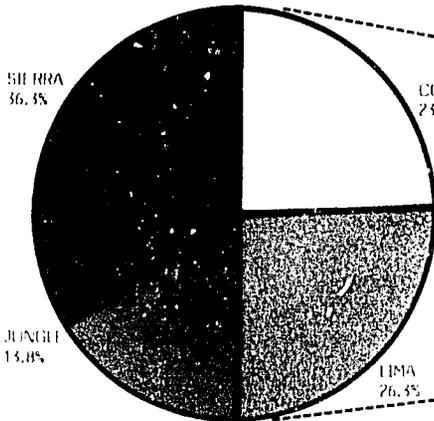


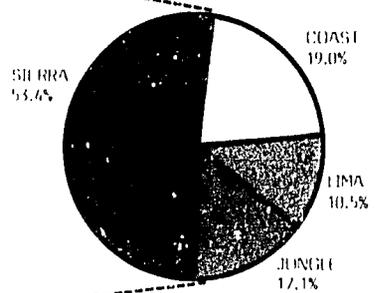
Figure 2.

MALNUTRITION IN CHILDREN UNDER SIX YEARS OF AGE  
PERU, 1984

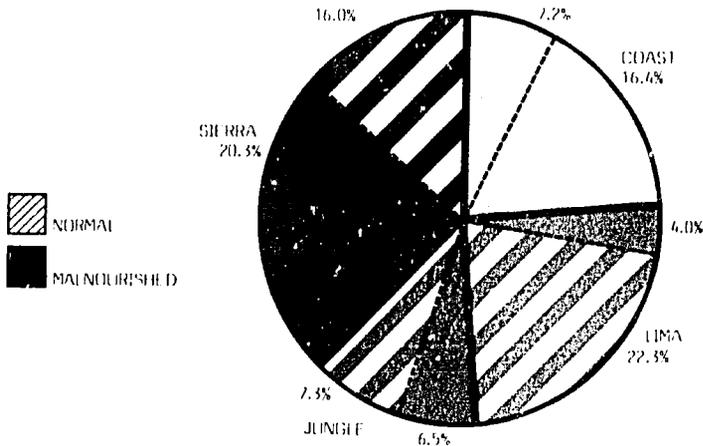
DISTRIBUTION OF THE PRE-SCHOOL POPULATION



DISTRIBUTION OF MALNOURISHED PRE-SCHOOL CHILDREN



PRE-SCHOOL POPULATION AND MALNUTRITION IN THE PRE-SCHOOL POPULATION



Organization of the United Nations recommends as adequate for Peru. While consumption is seldom as skewed as the income distribution, the income distribution in Peru has been sufficiently skewed (World Bank, 1981) that it is safe to say that in most years in the past three decades more than half of the population was significantly below recommended energy intake levels. Amaty Leon reported in 1972 that 52 percent of the households in a large national sample (ENCA) were below calorie recommendations and that over a third of the population was deficient in protein and most other nutrients. In addition, the composition of the diet has shifted from protein obtained from animal sources towards carbohydrates with cereals becoming the most important source of calories in the country.

There has been no recent nationwide survey of food consumption since the ENCA survey of 1972, but many indirect estimates developed by Franklin and collaborators for the World Bank and for AID suggest that the inadequacy of diets for the urban and rural poor of Peru, persists (World Bank, 1981; Franklin, et al., 1983). The most recent analysis suggests that during the 1970's the economic policies and agricultural pricing and trade policies were biased against the urban, poor and the rural poor of the Coast and that the nutritional situation of the poor in the highlands remained essentially as it had been in 1972 (Franklin et al., 1985a). These studies on the Consumption Effects of Agricultural Policies and the nutritional strategy fieldwork in 1983 also suggested that the deleterious effects of the droughts and floods were concentrated on the diets and incomes of the rural population. The benefits of food subsidies in the seventies and eighties have been concentrated in the urban population, primarily the upper income groups of Lima. These economic analyses seem to now be corroborated by the data from the 1984 National Nutrition and Health Survey (ENNSA).

### **Functional Classification Approach**

This report presents the results of a functional classification study of Peru which has been undertaken with the following objectives:

- to provide an analytical and quantitative basis for nutrition planning; and
- to provide information which might be useful in improving existing nutrition programs and projects, and for incorporating nutritional activities into developmental efforts.

This report is a condensation of "Acciones Contra las Causas de la Desnutricion en el Peru: Un Enfoque Funcional" by Parillon and colleagues (Parillon, et al., 1986). The study is based on data from the National Nutrition and Health Survey of 17,000 households which was developed by the National Institute of Statistics (INE). The study is based on the concepts of the "functional classification" approach as developed by Joy and Payne (1975), Joy (1973), Payne (1976), and as implemented by Valverde et al.(1978) and Franklin et al.(1985b).

The specific steps in the functional classification approach are:

- Define distinct categories of population groups in poverty conditions according to their connection to the economic and productive processes of the society in which they operate. These groups are called functional groups because an important characteristic of their definition is the occupation of the head of household.
- Locate these groups geographically and by administrative/ political subdivisions within a country, or regions of that country.
- Enumerate or otherwise estimate the size of each group in terms of number of persons affected in each group in each geographic or political/administrative subdivision.
- Describe the social and economic characteristics that may be causally related to specific nutritional problems for each functional group.

The purpose of a nutritional functional classification study is to provide diagnostic information to assist planners and service providers in locating and identifying population groups with important nutritional problems. The basic approach consists of identifying the geographic or politico-administrative location of population groups whose sociodemographic characteristics are causally or statistically related to the prevalence of important nutritional problems. The methods are a planning rather than an analytical tool. These methods permit an identification of the characteristics of population groups which allows the targetting of specific remedial activities, and provides estimates of the number of persons in each group and setting, to facilitate the estimation of costs and level of effort required to deliver services or other remedial actions.

The approach differs significantly from conventional nutrition planning approaches (Pines, 1982) in that these latter have been based principally on examining the sociodemographic, physiological or health characteristics of persons at nutritional risk. By contrast, the functional classification technique attempts to relate the prevalence of malnutrition in each identified functional group by characteristics of that functional group that are associated with their connection to the productive processes in the economy. In this manner the interventions or remedial actions that can be instituted include those which can be promoted through policy mechanisms.

Therefore, a functional classification study identifies, quantifies and locates groups of families according to their life pattern, social, economic and cultural problems, and the level of resources that are available to them. They are clustered according to these characteristics under the assumption that they will respond in a similar manner to specific policies and programs. The design of these interventions should, of course, be the results of rigorous economic and social cost-benefit analyses.

### **Definitions of Functional Groups**

The National Nutrition and Health Survey of Peru (ENNSA-1984) was designed to permit valid statistical inference at multiple levels: national, regional, and urban and rural areas. The sample also provided for planning zones and geographic breakdowns of the north, central, and southern areas of the Coast and Sierra and the high and low areas of the Jungle. For the purpose of this analysis, functional groups were formed on the basis of the occupational characteristics of the heads of household as reported by the person responding for the entire household (the detailed codes were provided by the National Institute of Statistics (INE)). In select cases the occupational codes did not permit sufficient differentiation of the households; particularly for agricultural activities, other data from the survey were used to form more specific occupational groups. Additionally the definitions of the functional groups were established so that these would be recognizable as major components of the Peruvian economic and social hierarchy.

The examination of the occupational codes and limited agricultural data from the survey resulted in the formation of eighteen functional groups from two major socioeconomic categories: 1) groups whose activity is directly connected to agriculture and; 2) groups with non-agricultural occupations. There are seven agricultural groups and eleven non-agricultural groups:

- **Farmer/Day Laborer.** This group is composed principally of households whose head was reported to have worked for daily wages on the farms of others.
- **Subsistence Farmers.** These are households which were headed by farmers and who reported that the production from the farm was principally for home consumption.
- **Small Commercial Farmers.** These farming households reported that their farm production was principally for the purpose of sales and they farmed less than three hectares of land.
- **Cooperative Members.** The heads of these households were members of cooperative farming and livestock organizations. The households who had a head who identified himself as a cooperative member and had an occupation code of a manager, director, or professional were excluded from this group.
- **Commercial Farmers.** These farming households reported that their farm production was principally for sale to the market and they farmed three or more hectares.
- **Diversified Farmers/Livestock Producers.** This group is composed of households where the head identified himself as farmer and/or livestock raiser and the agricultural enterprise produced several commodities.
- **Farm Workers.** Heads of households in this group received regular salaries from agricultural, animal husbandry and forestry labor.

The remaining eleven functional groups are composed of households with a head of the household engaged in non-agricultural work:

- **Construction Workers.** This group is composed of households whose head was identified as a construction worker.
- **Skilled Workers.** This group is composed of households in which the head was engaged in work which required some previous training such as mechanics, welders and photographers.

- **Street Vendors.** The heads of the households in this group derived income from informal petty trade.
- **Small Independent Merchants.** The households which had a head of household who ran a small commercial enterprise as a proprietor formed the core of this group. Small commercial fishermen were also included in this group.
- **Unskilled Workers.** The heads of household in this group received salaries from non-agricultural work which required little previous training such as ticket takers, knife sharpeners, etc. Mine workers were also included in this functional group.
- **Transportation Workers.** Households with a head employed as an independent transportation worker, such as drivers of trucks, buses and taxis were included in this group.
- **Service Employees.** The heads of the households in this group were salaried employees who provided non-clerical labor such as cooks and maids. Policemen and security personnel were also included in this category.
- **Retirees, Pensioners and Dependents.** Households headed by persons who received income from pensions, alimony or other transfers formed the core of this group.
- **Professionals and Technicians.** The households which were included in this group had a head of household who received income from professional services and/or technical labor such as lawyers, technical salesmen and radio equipment technicians.
- **Clerical and Sales Employees.** This group is composed of households in which the head of the household received a salary from commercial sales work and/or office work in the public or private sector.
- **Executives.** The heads of the households in this group reported their occupation to be upper level managers and administrators of public and private businesses and institutions.

The above groups are mutually exclusive and exhaust all of the surveyed households who reported an occupation for the head of the household. Further analysis of the other working members of the household revealed that approximately 60 percent of Peruvian households had only one person employed in a formal occupation. Analyses of the multiple employment within one household revealed that when there was more than one member employed, the head of household usually had the most formal occupation and the higher income.

### **Distribution of Nutritional Status by Functional Group**

For the purpose of this analysis, nutritional status was established at the household level by determining the nutritional status of the children under six years of age in the household. In this way, the nutritional status of the young children within the household serves as an indicator of the nutritional needs of all the members of the household because the household itself is the main environment in which the allocation of human and material resources determine the causes and consequences of undernutrition in all of its members. Therefore, if any preschool-aged child in the household was malnourished, the household was classified as "malnourished". In addition, by focusing on this age range rather than on older children and adults, it is possible to concentrate the analysis on the programs and policies of recent years.

Households without young children may also have had nutritional problems, but according to our statistical analyses these households exhibited slightly higher per capita incomes, smaller families, and fewer health problems than the households with young children. With regard to the other socio-economic variables, the households without children tended to be more like the households without malnutrition than to the households with a malnourished child.

The nutritional status of a child under six years of age was defined to be in one of three states: the child was in a crisis situation, the child was severely stunted or the child was chronically malnourished. Based on the recommendation by the World Health Organization that the height-for-age measurement be used to assess the prevalence of chronic malnutrition in a given population (Mason et al., 1984), the **chronically malnourished** children were defined as those children below two standard deviations from the reference mean for the child's height for a given age. One reason for selecting this cutoff value was that in the population of normally growing children, the percent of children expected to be below two standard deviations from the reference mean is only 2.3 percent. Similarly, the percent of children expected to be below three

standard deviations from the reference mean is minimal (.14 %). Since only a small percentage of children would be expected to have anthropometric measurements below this reference cutoff value, the Peruvian children who fall below three standard deviations from the reference mean for their height for age were said to be **severely stunted** children. Those children who were found to be both underweight (defined as below two standard deviations from the reference standard of weight for age) and severely stunted were in danger of death and classified in this study to be in a **crisis situation**.

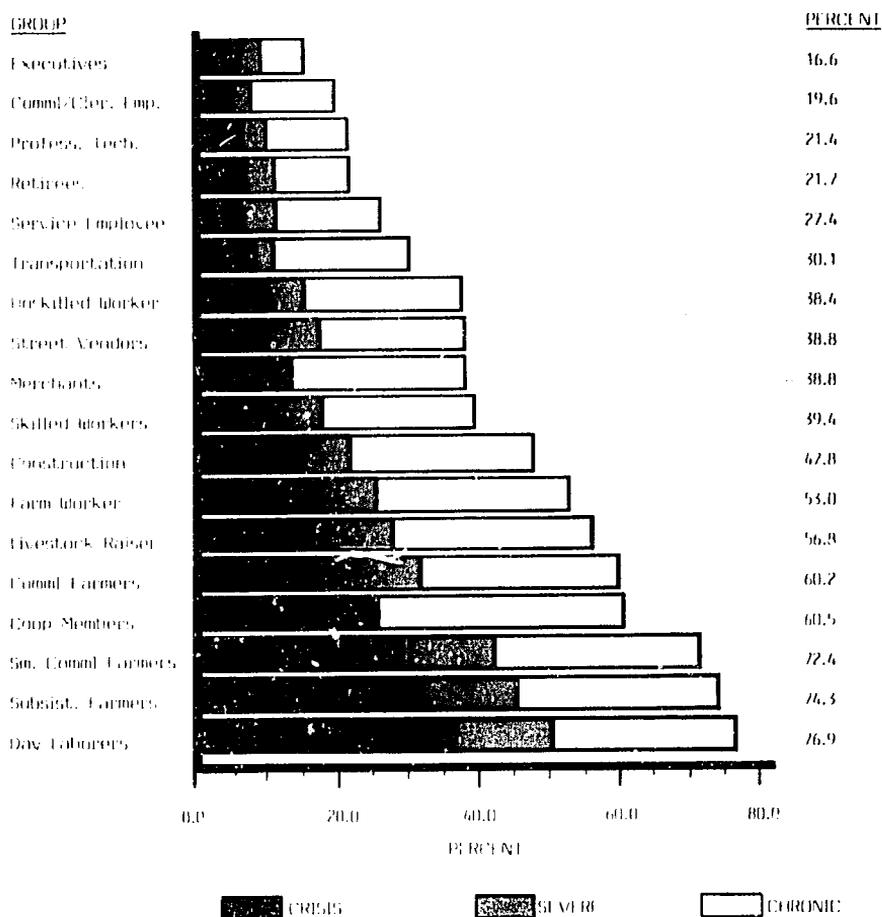
Figure 3 presents the functional groups ordered in descending order of the prevalence of chronic malnutrition within the households with preschool aged children. The groups which had the head of household engaged in work in the agricultural sector and the rural economy had the highest prevalence of malnutrition as measured by all three indicators of malnutrition: chronically malnourished, severely stunted and in a crisis situation. Almost 60 percent of all of the malnourished children in Peru lived in households whose head was dependent on the agricultural sector for his or her income and employment. The two groups which had the highest malnutrition were the day laborers and the subsistence farmers. These two groups alone accounted for 50 percent of the rural farmers as well as 30 percent of the malnutrition in the country as a whole.

All of the agricultural or rural functional groups had higher prevalences of malnutrition than did the urban groups. As a whole, the rural groups had 71% of the preschool population who were in immediate danger or in a crisis state and the remaining 29 percent were in the urban groups. This strong rural-urban dichotomy is further revealed by the fact that the group with the highest prevalence of malnutrition in the urban areas, the construction workers, had a prevalence of malnutrition (47.8 %) which was ten percent lower than even the best of the rural groups, the farm workers. These results suggest that the children who lived in the urban areas who were in a crisis situation were able to recover more quickly and remained in a stable state more easily than did the children who lived in the rural areas. The rural children continue to live in an environment which fosters recurrent episodes of malnutrition and the crisis and chronic conditions continue to persist in the environment.

Over the years there has been considerable debate concerning the full genetic potential of the height of the Peruvian population. If as some researchers have suggested, the genetic potential of the Peruvian children is the 25th percentile of the commonly used Boston standards (Graham et. al, 1979) which is approximately equivalent to one standard deviation from the reference mean for height, the degree of malnutrition is still very substantial in many functional groups (figure 3). Another in-

Figure 3.

PERCENTAGE OF HOUSEHOLDS WITH MALNUTRITION  
by Functional Group  
PERU, 1984



terpretation of the full genetic potential of the Peruvian population could be that the genetic norm of the society is that height which is reflected in the upper income groups of the country (i.e. the executives, the professionals, etc.). If either of these assumptions of genetic potential were true, **it is still a fact that more than half of the households in the rural functional groups had a chronically malnourished child under six years of age.**

### **Socioeconomic Characteristics of the Functional Groups**

Very low incomes, large families, poor sanitation, lack of adequate water, high morbidity and low levels of schooling were related to malnutrition in the Peruvian households in 1984 as seen in Tables 1, 2, and 3. Table 1 presents the variation of specific socioeconomic indicators by degree or type of malnutrition which was present in the household. Table 2 presents the functional groups ranked by the prevalence of malnutrition, and associates each group with its median household income, average family size, years of schooling of the head of the household, number of working members within the household and a dependency index which measures how many persons in the household were dependent on one working person's income. Table 3 presents the measures of adequacy of the facilities within the physical dwelling in which the household lived as well as a measure of household morbidity from diarrheal disease.

The results from Table 1 indicate that in 1984, malnutrition in Peru was significantly associated with lower incomes, larger families, higher morbidity, a head of the household with lower levels of schooling and inadequate public services such as water and sanitation. The households with malnutrition had fewer working persons per household and at least one additional family member than the households with young children of normal height and weight. In addition, Table 2 reveals that the lower incomes were concentrated in the rural and agricultural functional groups, with a strong correlation between income and the prevalence of nutritional problems in these groups. This result indicates that for most of the rural functional groups the central cause of malnutrition was lack of income which resulted in inadequate diets because these households had minimal if any purchasing power to consume the basic and necessary foods. As a whole, the households in the rural groups reported incomes which were only 25 percent of the national median level of income (300 Intis per month). As seen in table 3, the rural groups with the highest prevalence of malnutrition, the agricultural groups, also had poor coverage of adequate water and sanitation and somewhat higher incidence of diarrheal disease. These facts coupled with the very low incomes and

Table 1. Socioeconomic Variations by Nutritional Status Indicator  
Peru, 1984

| Household Variable                          | Household has:               |                                     |   |                          |                             |
|---|------------------------------|-------------------------------------|---|--------------------------|-----------------------------|
|   | Child in Crisis <sup>1</sup> | Severely Stunted Child <sup>1</sup> | Chronically Malnourished Child <sup>1</sup> | No Malnourished Children | No Children Under Six Years |
| Median Household Income <sup>2</sup>        | 95.0                         | 100.1                               | 160.0                                       | 412.0                    | 302.0                       |
| Average Household Size                      | 7.3                          | 7.3                                 | 7.1   | 6.3                      | 4.5                         |
| Years of Schooling for Head of Household    | 3.7                          | 3.7                                 | 4.4   | 7.8                      | 6.0                         |
| Years of Schooling for Spouse               | 2.4                          | 2.4                                 | 3.0   | 6.7                      | 4.9                         |
| Average number of working persons/household | 1.4                          | 1.4                                 | 1.5   | 1.8                      | 1.6                         |
| Dependency Index <sup>3</sup>               | 6.0                          | 5.9                                 | 5.5   | 4.2                      | 3.2                         |
| % with recent morbidity                     | 39.9                         | 37.6                                | 36.7  | 24.3                     | 12.7                        |
| % with adequate water                       | 21.5                         | 22.2                                | 27.8  | 64.5                     | 57.7                        |

<sup>1</sup>These three categories of malnutrition are not mutually exclusive - the children in crisis situations are severely stunted and the severely stunted are chronically malnourished. Results from analysis of variance which was undertaken by dividing the categories into exclusive categories of: in crisis, severely stunted but not underweight and chronically malnourished but not severely stunted and normal showed statistical association of income, family size, level of schooling, morbidity and sanitation with malnutrition.

<sup>2</sup>Intis per month, 1984; one Inti = .29 U.S. dollars.

<sup>3</sup>Ratio of the total household size to the number of working members of the household.

Table 2. Socioeconomic Characteristics of the Households by Functional Group  
Peru, 1984.

| Functional Groups                           | Average Household Size | Median Household Income <sup>1</sup> | Number of Persons Working per Household | Average Index of Dependency <sup>2</sup> | Average Years Schooling of the Head of Household |
|---|------------------------|--------------------------------------|---|--|--|
| Farmer/Day Laborers                         | 5.7                    | 16.7                                 | 1.2                                     | 5.2                                      | 2.0  |
| Subsistence Farmers                         | 5.7                    | 20.8                                 | 1.2                                     | 5.1                                      | 2.2  |
| Small Commercial Farmers                    | 5.7                    | 41.7                                 | 1.3                                     | 4.7                                      | 2.8  |
| Cooperative Members                         | 6.5                    | 258.0                                | 1.6                                     | 4.7                                      | 2.7  |
| Commercial Farmers                          | 5.9                    | 83.3                                 | 1.5                                     | 4.7                                      | 3.6  |
| Diversified Farmers and Livestock Producers | 5.3                    | 45.8                                 | 1.3                                     | 4.5                                      | 3.5  |
| Farm Workers                                | 5.8                    | 160.0                                | 1.8                                     | 3.7                                      | 3.2  |
| Construction Workers                        | 6.2                    | 310.0                                | 1.8                                     | 4.1                                      | 5.1  |
| Skilled Workers                             | 5.7                    | 356.9                                | 1.7                                     | 3.9                                      | 6.2  |
| Street Vendors                              | 5.6                    | 300.0                                | 1.8                                     | 3.7                                      | 5.6  |
| Small Independent Merchants                 | 5.5                    | 400.0                                | 1.7                                     | 3.8                                      | 6.5  |
| Unskilled Workers                           | 6.2                    | 400.0                                | 1.7                                     | 4.2                                      | 6.2  |
| Transportation Workers                      | 6.0                    | 465.3                                | 1.7                                     | 4.1                                      | 7.4  |
| Service Employees                           | 5.6                    | 403.0                                | 1.7                                     | 2.8                                      | 7.2  |
| Retirees, Pensioners and Dependents         | 4.7                    | 386.5                                | 2.0                                     | 2.7                                      | 6.9  |
| Professionals and Technicians               | 5.5                    | 800.0                                | 1.9                                     | 3.4                                      | 13.3   |
| Clerical and Sales Employees                | 5.5                    | 600.0                                | 1.8                                     | 3.6                                      | 10.3   |
| Executives, (Public & Private Sector)       | 5.7                    | 1000.0                               | 2.0                                     | 3.3                                      | 10.9   |
| TOTAL                                       | 5.6                    | 300.0                                | 1.6                                     | 4.0                                      | 6.1  |

<sup>1</sup>Intis per month

<sup>2</sup>Ratio of the total household size to the number of working members of the household

**Table 3. Characteristics of Housing Facilities and Household Morbidity by Functional Group  
Peru, 1984**

| Functional Group                            | Number of Households | Number of Households w/Children | Percentage of Households with: |                                   |                         |
|---|----------------------|---------------------------------|--------------------------------|-----------------------------------|-------------------------|
|   |                      |                                 | Separate Bathroom              | Connection to Public Water System | Recent Case of Diarrhea |
| Emergent Laborers                           | 204,538              | 115,149                         | 2.7                            | 5.4                               | 29.7                    |
| Subsistence Farmers                         | 350,293              | 196,206                         | 4.6                            | 11.7                              | 30.8                    |
| Small Commercial Farmers                    | 122,247              | 63,386                          | 11.4                           | 14.0                              | 34.6                    |
| Cooperative Members                         | 35,720               | 22,784                          | 16.8                           | 25.0                              | 35.8                    |
| Commercial Farmers                          | 191,859              | 103,481                         | 21.0                           | 19.9                              | 32.8                    |
| Diversified Farmers and Livestock Producers | 52,883               | 22,459                          | 14.7                           | 13.8                              | 24.3                    |
| Farm Workers                                | 141,984              | 81,536                          | 19.9                           | 26.1                              | 35.2                    |
| Construction Workers                        | 146,653              | 86,532                          | 51.3                           | 56.0                              | 32.4                    |
| Skilled Workers                             | 337,914              | 183,038                         | 55.3                           | 65.4                              | 32.0                    |
| Street Vendors                              | 132,427              | 76,778                          | 54.3                           | 66.8                              | 34.4                    |
| Small Independent Merchants                 | 179,865              | 82,635                          | 63.9                           | 71.7                              | 33.1                    |
| Unskilled Workers                           | 130,035              | 81,818                          | 56.9                           | 63.9                              | 31.9                    |
| Transportation Workers                      | 133,026              | 78,641                          | 68.3                           | 72.2                              | 25.2                    |
| Service Employees                           | 180,402              | 99,338                          | 64.3                           | 70.3                              | 28.3                    |
| Retirees, Pensioners and Dependents         | 181,211              | 45,493                          | 74.0                           | 79.9                              | 21.2                    |
| Professionals and Technicians               | 291,824              | 145,524                         | 82.1                           | 86.2                              | 19.4                    |
| Clerical and Sales Employees                | 182,932              | 96,881                          | 77.2                           | 81.0                              | 22.2                    |
| Executives, (Public & Private Sector)       | 111,272              | 55,615                          | 86.3                           | 87.9                              | 20.5                    |
| <b>TOTAL</b>                                | <b>3,107,085</b>     | <b>1,636,794</b>                | <b>46.9</b>                    | <b>52.4</b>                       | <b>29.2</b>             |

low levels of schooling of these farmers and day laborers indicate that these households would benefit greatly from both income generating activities and basic services (adequate water and schooling of the members of the household).

### **Distribution of Malnutrition and the Functional Groups**

Analyses of the distribution of the functional groups by regions (table 4) designated several areas as requiring priority attention. The criteria for selection included the high rates of malnutrition as well as the size of the population affected in each group. For example, the day laborers and subsistence farmers of the Sierra and the Jungle represented not only over a half of a million households, but also one third of the malnutrition in the country as a whole. Approximately three out of every four children in Sierra households which were headed by day laborers and subsistence farmers were chronically malnourished in 1984. On the other hand, though the prevalence of malnutrition may not be as high in the groups represented by the construction workers, unskilled and skilled workers and petty vendors who lived in Lima, the absolute number of households in these groups was substantial (approximately 315,000 households).

The regions which warrant particular priority are presented in Table 5. The two areas which require most attention, the Sierra and the Jungle were inhabited predominantly by the functional groups of day laborers, subsistence farmers and small commercial farmers that had the highest prevalence of malnutrition. In these areas, the level of schooling of the head of household was low, the incomes were among the lowest in the country, coverage of adequate water was very low, and the households had large families dependent on principally one income. In these areas the principal means of improving the nutritional status of the population would be through increased access to basic services such as water and sanitation and through the distribution of basic foods which supplement the rural diets and for which these households do not have the income to purchase such foods. On the other hand, the priority groups in the urban areas would benefit greatly from increased access to health services, particularly related to the treatment of diarrheal disease. Improvement of the access to low cost clean water would be very important in this regard given the unhealthy and costly manner in which water is obtained from vendors in the shanty towns.

Table 4. Number of Households within each Functional Group by Region  
Peru, 1984

|                          | Coast            |                  |                  |                 |                |                | Sierra         |                  |                 |                  |                 |                  | Jungle         |                  |                 |                  | Lima              |
|--------------------------|------------------|------------------|------------------|-----------------|----------------|----------------|----------------|------------------|-----------------|------------------|-----------------|------------------|----------------|------------------|-----------------|------------------|-------------------|
|                          | North            |                  | Central          |                 | South          |                | North          |                  | Central         |                  | South           |                  | High           |                  | Low             |                  |                   |
|                          | Urban            | Rural            | Urban            | Rural           | Urban          | Rural          | Urban          | Rural            | Urban           | Rural            | Urban           | Rural            | Urban          | Rural            | Urban           | Rural            |                   |
|                          |                  |                  |                  |                 |                |                |                |                  |                 |                  |                 |                  |                |                  |                 |                  |                   |
| Farmer/Day Laborers      | 736<br>(2.4)     | 4,818<br>(2.4)   | 374<br>-         | 182<br>-        | 0<br>-         | 150<br>-       | 74<br>-        | 61,318<br>(30.0) | 864<br>-        | 41,518<br>(20.3) | 2,181<br>(1.1)  | 78,312<br>(38.3) | 310<br>-       | 11,799<br>(5.8)  | 101<br>-        | 1,205<br>-       | 0<br>-            |
| Subsistence Farmers      | 2,720<br>-       | 16,504<br>(4.7)  | 712<br>-         | 3,439<br>(1.0)  | 104<br>-       | 1,448<br>-     | 2,110<br>-     | 98,258<br>(28.1) | 6,895<br>(2.0)  | 97,556<br>(27.8) | 3,307<br>-      | 77,240<br>(22.1) | 1,576<br>-     | 26,105<br>(7.5)  | 1,902<br>-      | 9,637<br>(2.8)   | 784<br>-          |
| Small Commercial Farmers | 3,232<br>(2.6)   | 7,340<br>(6.0)   | 2,496<br>(2.0)   | 3,369<br>(2.8)  | 348<br>-       | 799<br>-       | 778<br>(18.0)  | 22,013<br>(14.4) | 1,694<br>(1.4)  | 26,760<br>(21.9) | 915<br>-        | 11,545<br>(9.4)  | 1,309<br>(1.1) | 16,743<br>(13.7) | 3,077<br>(2.5)  | 19,829<br>(16.2) | 0<br>-            |
| Coop. Members            | 4,380<br>(12.3)  | 11,634<br>(32.6) | 2,944<br>(8.2)   | 6,055<br>(17.0) | 0<br>-         | 271<br>-       | 0<br>-         | 366<br>(2.4)     | 288<br>-        | 2,252<br>(6.3)   | 0<br>-          | 6,246<br>(17.5)  | 0<br>-         | 646<br>(1.8)     | 0<br>-          | 138<br>-         | 0<br>-            |
| Commercial Farmers       | 9,284<br>(4.8)   | 20,922<br>(10.9) | 4,024<br>(2.1)   | 9,501<br>(5.0)  | 764<br>-       | 4,964<br>(2.4) | 568<br>-       | 23,368<br>(12.2) | 1,787<br>-      | 25,540<br>(13.1) | 4,578<br>(2.4)  | 5,729<br>(3.0)   | 3,376<br>(1.8) | 44,022<br>(22.9) | 3,538<br>(1.8)  | 28,433<br>(14.8) | 1,461<br>-        |
| Livestock Raisers        | 736<br>(1.4)     | 2,080<br>(3.9)   | 104<br>-         | 1,254<br>(2.4)  | 352<br>-       | 2,446<br>(4.6) | 441<br>-       | 5,899<br>(11.2)  | 288<br>-        | 9,788<br>(4.5)   | 774<br>(1.5)    | 20,162<br>(38.1) | 421<br>-       | 2,541<br>(4.8)   | 579<br>(1.1)    | 4,625<br>(8.7)   | 392<br>-          |
| Farm Workers             | 17,108<br>(12.0) | 25,104<br>(16.3) | 9,376<br>(6.8)   | 13,537<br>(9.5) | 2,188<br>(1.5) | 5,284<br>(3.7) | 623<br>-       | 11,036<br>(7.8)  | 1,677<br>(1.2)  | 16,318<br>(11.5) | 5,442<br>(3.8)  | 10,286<br>(7.2)  | 2,713<br>(1.9) | 9,655<br>(6.8)   | 2,417<br>(1.7)  | 2,474<br>(1.7)   | 2,766<br>(6.0)    |
| Construction Workers     | 15,484<br>(10.6) | 2,406<br>(1.8)   | 9,544<br>(6.5)   | 1,677<br>(1.1)  | 2,024<br>(1.4) | 499<br>-       | 1,825<br>(1.2) | 4,496<br>(3.1)   | 5,107<br>(3.5)  | 9,826<br>(6.7)   | 12,954<br>(8.8) | 5,368<br>(3.7)   | 2,334<br>(1.6) | 956<br>-         | 4,770<br>(3.3)  | 791<br>-         | 66,598<br>(46.1)  |
| Skilled Workers          | 43,120<br>(12.8) | 4,474<br>(1.3)   | 20,272<br>(6.0)  | 3,462<br>(1.0)  | 4,604<br>(1.4) | 1,090<br>-     | 4,259<br>(1.3) | 13,308<br>(3.9)  | 17,447<br>(5.2) | 13,462<br>(4.0)  | 29,496<br>(5.7) | 16,806<br>(5.0)  | 3,531<br>(1.0) | 3,428<br>(1.0)   | 11,620<br>(3.4) | 1,619<br>-       | 145,916<br>(42.7) |
| Merchants                | 23,284<br>(17.6) | 2,046<br>(1.5)   | 10,664<br>(8.1)  | 1,123<br>-      | 2,488<br>(1.9) | 75<br>-        | 1,308<br>(1.0) | 1,628<br>(1.2)   | 6,259<br>(4.7)  | 1,384<br>(1.0)   | 11,755<br>(8.9) | 488<br>-         | 2,110<br>(1.6) | 577<br>-         | 5,948<br>(4.5)  | 0<br>-           | 61,290<br>(46.4)  |
| Street Vendors           | 31,092<br>(17.3) | 2,934<br>(1.6)   | 18,416<br>(10.2) | 2,064<br>(1.1)  | 4,700<br>(2.6) | 1,324<br>-     | 3,807<br>(2.1) | 4,839<br>(2.7)   | 10,536<br>(5.9) | 8,266<br>(4.6)   | 15,487<br>(8.6) | 2,469<br>(1.4)   | 4,651<br>(2.6) | 1,740<br>(1.0)   | 10,617<br>(5.9) | 2,548<br>(1.4)   | 56,375<br>(30.2)  |

Table 4 (cont.) Number of Households within each Functional Group by Region  
Peru, 1984

|                        | Coast                          |                  |                  |                 |                 |                 | Sierra          |                  |                  |                  |                  |                  | Jungle          |                  |                 |                 | Lima              |
|------------------------|--------------------------------|------------------|------------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|------------------|------------------|-----------------|------------------|-----------------|-----------------|-------------------|
|                        | North                          |                  | Central          |                 | South           |                 | North           |                  | Central          |                  | South            |                  | High            |                  | Low             |                 |                   |
|                        | Urban                          | Rural            | Urban            | Rural           | Urban           | Rural           | Urban           | Rural            | Urban            | Rural            | Urban            | Rural            | Urban           | Rural            | Urban           | Rural           |                   |
| Unskilled Workers      | 26,228<br>(20.2)               | 1,540<br>(1.2)   | 10,328<br>(7.9)  | 941<br>-        | 2,540<br>(2.0)  | 225<br>-        | 851<br>-        | 1,867<br>(1.4)   | 12,737<br>(9.8)  | 2,554<br>(2.0)   | 11,052<br>(8.5)  | 5,691<br>(4.4)   | 870<br>-        | 155<br>-         | 4,292<br>(3.3)  | 202<br>-        | 47,962<br>(36.9)  |
| Transportation Workers | 24,344<br>(18.3)               | 2,518<br>(1.9)   | 11,224<br>(8.4)  | 2,303<br>(1.7)  | 2,352<br>(1.8)  | 0<br>-          | 1,178<br>-      | 433<br>-         | 5,852<br>(4.4)   | 1,774<br>(1.3)   | 12,043<br>(9.1)  | 976<br>-         | 1,137<br>-      | 534<br>-         | 2,437<br>(1.8)  | 138<br>-        | 63,783<br>(47.1)  |
| Service Employees      | 33,600<br>(18.0)               | 1,956<br>(1.1)   | 11,856<br>(6.6)  | 841<br>-        | 3,388<br>(1.9)  | 773<br>-        | 2,506<br>(1.4)  | 1,912<br>(1.1)   | 5,776<br>(3.2)   | 3,548<br>(2.0)   | 14,432<br>(8.0)  | 1,669<br>-       | 2,110<br>(1.2)  | 689<br>-         | 7,759<br>(4.3)  | 892<br>-        | 86,695<br>(48.1)  |
| Retirees               | 27,848<br>(15.4)               | 3,810<br>(2.1)   | 11,184<br>(6.2)  | 3,090<br>(1.7)  | 2,368<br>(1.3)  | 323<br>-        | 2,309<br>(1.3)  | 2,559<br>(1.4)   | 7,309<br>(4.0)   | 6,970<br>(3.8)   | 15,764<br>(8.7)  | 2,235<br>(1.2)   | 1,912<br>(1.1)  | 1,843<br>(1.0)   | 2,629<br>(1.5)  | 138<br>-        | 88,940<br>(50.8)  |
| Professionals          | 32,724<br>(11.2)               | 1,596<br>-       | 16,352<br>(5.6)  | 1,513<br>-      | 5,376<br>(1.8)  | 450<br>-        | 4,596<br>(1.6)  | 2,553<br>-       | 22,156<br>(7.6)  | 7,574<br>(2.6)   | 26,610<br>(9.1)  | 3,211<br>(1.1)   | 4,883<br>(1.7)  | 3,221<br>(1.1)   | 11,694<br>(4.0) | 3,356<br>(1.2)  | 143,959<br>(49.2) |
| Technicians            | 24,068<br>(13.2)               | 2,276<br>(1.2)   | 9,552<br>(5.2)   | 1,213<br>-      | 3,308<br>(1.8)  | 0<br>-          | 2,092<br>(1.1)  | 433<br>-         | 11,696<br>(6.4)  | 2,944<br>(1.6)   | 15,766<br>(8.6)  | 849<br>-         | 2,446<br>(1.3)  | 646<br>-         | 7,163<br>(3.9)  | 276<br>-        | 98,204<br>(53.5)  |
| Clerical and Sales     | 15,184<br>(13.6)               | 1,450<br>(1.3)   | 5,520<br>(5.0)   | 423<br>-        | 1,812<br>(1.6)  | 600<br>-        | 1,262<br>(1.1)  | 1,195<br>(1.1)   | 4,641<br>(4.2)   | 1,774<br>(1.6)   | 8,026<br>(7.2)   | 566<br>-         | 2,179<br>(2.0)  | 715<br>-         | 4,467<br>(4.0)  | 276<br>-        | 61,182<br>(54.8)  |
| Executives             | 335,172<br>(10.8) <sup>2</sup> | 113,402<br>(3.6) | 154,872<br>(5.0) | 55,987<br>(1.8) | 38,716<br>(1.2) | 20,721<br>(0.7) | 31,249<br>(1.0) | 257,961<br>(8.3) | 123,009<br>(4.0) | 279,808<br>(9.0) | 190,562<br>(6.1) | 249,848<br>(8.0) | 37,869<br>(1.2) | 126,015<br>(4.1) | 85,010<br>(2.7) | 76,577<br>(2.5) | 930,307<br>(30.0) |

<sup>1</sup>percentages within each group are expressed in parentheses; "-" indicates less than 1 percent

<sup>2</sup>percentage of households within each regional area

Table 5. Socioeconomic Characteristics of the  
Priority Groups by Region  
Peru, 1984

|                              | Number<br>of<br>Households | Average<br>Family<br>Size | Median<br>Household<br>Income <sup>1</sup> | Average<br>Schooling<br>of the<br>Head of<br>Household | Average<br>Number of<br>Working<br>Members in<br>Household | Percent of<br>Households<br>with<br>Adequate<br>Water |
|------------------------------|----------------------------|---------------------------|--|--|--|---|
| <u>Rural Priority Groups</u> |                            |                           |  |  |  |   |
| Sierra                       |                            |                           |  |  |  |   |
| North                        | 197,787                    | 6.1                       | 24.2                                       | 2.0  | 1.2  | 6.0   |
| Central                      | 191,374                    | 5.4                       | 20.0                                       | 2.5  | 1.2  | 17.9  |
| South                        | 172,826                    | 4.7                       | 12.5                                       | 2.1  | 1.1  | 2.6   |
| Jungle                       |                            |                           |  |  |  |   |
| High                         | 98,669                     | 6.1                       | 66.7                                       | 2.8  | 1.3  | 5.9   |
| Low                          | 59,104                     | 6.7                       | 50.0                                       | 3.0  | 1.3  | 0.2   |
| Coast                        |                            |                           |  |  |  |   |
| North                        | 37,426                     | 6.6                       | 72.8                                       | 2.2  | 1.5  | 8.5   |
| <u>Urban Priority Groups</u> |                            |                           |  |  |  |   |
| Sierra                       |                            |                           |  |  |  |   |
| Central                      | 17,447                     | 5.8                       | 280.0                                      | 6.6  | 1.6  | 75.7  |
| South                        | 63,147                     | 5.5                       | 300.0                                      | 5.7  | 1.6  | 64.3  |
| Coast                        |                            |                           |  |  |  |   |
| North                        | 107,840                    | 6.3                       | 350.0                                      | 5.5  | 1.7  | 68.9  |
| Central                      | 50,808                     | 5.8                       | 350.0                                      | 5.8  | 1.7  | 77.0  |
| Lima                         | 321,766                    | 5.9                       | 400.0                                      | 6.9  | 1.9  | 72.6  |

<sup>1</sup>Intis per month, 1984; one Inti = .29 U.S. dollars.

Tables 6 and 7 present the results of estimating the likelihood that a household in the urban and rural priority groups had a malnourished child given the socioeconomic characteristics of the household (income, family size, education of the head of household, and availability of basic services). The two dependent variables used in the logistic regression estimation were : (1) the indicator that a household had a child in a crisis situation and (2) the indicator that a household had a severely stunted child of preschool age. These two variables were defined in order to possibly separate the determinants of severely stunted children from the determinants of malnourished children who needed immediate attention (crisis state).

In the urban priority groups (table 6), only two variables significantly determined that a household had a child in a crisis situation-- household income and household size. The significant determinants of severe stunting were not only household income and household size, but also, adequate sanitation and the level of schooling of the head of the household.

For the rural priority groups (table 7), illness (measured by a recent episode of diarrheal disease), household income, and household size were significant predictors that a household had a child in a crisis situation. These same predictors as well as the level of schooling of the head of the household were significant in predicting that a household had a severely stunted child. It was not surprising that the indicators of safe water and adequate sanitation were not significant in the rural model since adequate water and sanitation was essentially nonexistent in these households (only five percent of the households in the rural priority groups had safe water and less than one percent of these households had adequate sanitation).

These empirical results imply that in both the urban and rural priority groups, the households with a child in a crisis situation were those households which were considered to be the "poorest of the poor". Analysis of variance showed that the households with a malnourished child in the priority groups had lower incomes, fewer public services such as water and sanitation and usually one additional family member than households without malnutrition in the priority groups. All of these households need mechanisms for generating income for their larger families. In order to prevent chronic malnutrition in the urban priority groups, the households need better water and sanitation as well as higher incomes. In the rural areas, the general interpretation of the results of the logistic regression model is that the availability of health services and adequate water and sanitation are needed to prevent diarrheal disease and other transmissible diseases, and increased household incomes are essential

Table 6. Estimation of the Probability that a Household has a Malnourished Child in the Urban Priority Groups Peru, 1984.

| VARIABLE                       | Dependent Variable                           |           |   |           |
|--------------------------------|--|-----------|---|-----------|
|                                | Household with a Child in Nutritional Crisis |           | Household with a Child with Severe Malnutrition |           |
|                                | Regression Coefficient                       | p - value | Regression Coefficient                          | p - value |
| Intercept                      | -2.574                                       | .000      | -2.036  | .000      |
| Diarrhea                       | 0.276  | .220      | 0.119   | .344      |
| Potable Water                  | -0.186                                       | .439      | -0.298  | .111      |
| Household Income               | -0.001*                                      | .062      | -0.001**  | .000      |
| Household Size                 | 0.118**                                      | .006      | 0.172**   | .000      |
| Education of Head of Household | -0.051                                       | .116      | -0.052**  | .039      |
| Adequate Sanitation            | -0.392                                       | .181      | -0.662**  | .006      |
| Model chi-square               |  | 19.2      |   | 50.9      |
| n                              |  | 1221      |   | 1221      |

\*\* Significant at the 0.05 level of significance.

\* Significant at the 0.10 level of significance.

Negative signs on the estimated coefficients imply a lower probability of malnutrition and positive signs imply a higher probability of malnutrition.

Table 7. Estimation of the Probability that a Household has a Malnourished Child in the Rural Priority Groups Peru, 1984.

| VARIABLE                       | Dependent Variable                           |           |   |           |
|--------------------------------|--|-----------|---|-----------|
|                                | Household with a Child in Nutritional Crisis |           | Household with a Child with Severe Malnutrition |           |
|                                | Regression Coefficient                       | p - value | Regression Coefficient                          | p - value |
| Intercept                      | -1.482                                       | .000      | -0.878  | .000      |
| Diarrhea                       | 0.397**                                      | .000      | 0.334**   | .001      |
| Potable Water                  | -0.244                                       | .365      | -0.271  | 0.258     |
| Household Income               | -0.001**                                     | .000      | -0.001**  | .001      |
| Household Size                 | 0.095**                                      | .000      | 0.102**   | .000      |
| Education of Head of Household | -0.034                                       | .126      | -0.063**  | .002      |
| Adequate Sanitation            | 0.257  | .822      | -0.349  | .756      |
| Model chi-square               |  | 46.0      |   | 61.7      |
| n                              |  | 1791      |   | 1791      |

\*\* Significant at the 0.05 level of significance.

\* Significant at the 0.10 level of significance.

Negative signs on the estimated coefficients imply a lower probability of malnutrition and positive signs imply a higher probability of malnutrition.

to the improvement of the nutritional status of this population. The statistical results for the rural groups suggests a process whereby children living under chronic conditions are "pushed" into a crisis state by episodes of disease.

## Conclusions and Recommendations

The data from the National Nutrition and Health Survey undertaken in 1984 were used as the basis for a functional classification study which was undertaken to identify, quantify, and locate households which were subject to nutritional risk and malnutrition in the members of the household. The principal findings of the functional classification study are:

- Nine in every 100 children under six years of age living in Peru in 1984 were severely stunted in height and underweight for their ages and therefore in immediate danger; an additional seven percent of the preschool children were severely stunted and an additional 22 percent were short for their ages.
- More than 70 percent of the children in immediate danger lived in households dependent on the agricultural sector for employment and/or income.
- Almost half (45.1 %) of the Peruvian households with young children had a child who was short for his/her age, whereas 23 percent of the households had a severely stunted child. Fifteen out of every 100 households had a child in immediate danger who was both underweight and severely stunted.
- The households with malnourished preschoolers also suffered from other deprivations: crowded housing, poor sanitation, a lack of water, high morbidity from diarrheal disease, very low incomes and low levels of schooling for all their members.
- The regional areas in need of immediate attention are the Sierra, the Jungle and the highlands of the northern Coast. Three out of every four children living in the Sierra were chronically malnourished. The relative risk of malnutrition was almost four times greater for a child living in the Sierra relative to a child who lived in metropolitan Lima.

- The groups which were defined to be in need of priority assistance in the rural areas were the day laborers, subsistence farmers and commercial farmers of the Sierra, Jungle and northern Coast. These households need assistance in the form of basic services (water, sanitation, schooling, health) as well as income generating activities.
- The households in the urban areas which were headed by construction workers, skilled and unskilled workers and petty vendors required priority attention particularly in terms of water and sanitation and health services for treatment of transmissible diseases such as diarrhea.

These results confirmed that Peru continues to suffer from a persistent problem of chronic malnutrition and poverty for a large proportion of its population. The statistical evidence is overwhelming; in 1984, 248,587 households in Peru were living under such precarious conditions that at least one of their children was in nutritional crisis and the factors associated with the syndrome of multiple deprivations known as malnutrition. Many of these children have most probably died since 1984. An additional 125,035 households had children whose nutritional status was considered severe, and more than an additional 365,000 households had children with chronic malnutrition. That is, three fourths of a million families lived in households having at least one malnourished child. **The number of children under six years of age with chronic malnutrition exceeded one million and approximately a quarter of a million Peruvian children were severely stunted and underweight for their ages at high risk of severe illness or death.**

Approximately sixty percent of the households with malnourished children were engaged in agricultural production and agricultural wage work for their livelihood. Their economic output in terms of product and labor effort was insufficient to provide them adequate diets, housing, sanitation, water and access to preventive and curative health services. Their poor health and diets in turn prevented them from participating more fully in the economic processes of the society. For the long run, the solution is to reverse (and perhaps compensate for) the long standing and continuing bias against agriculture and labor, particularly in the highlands. Such reversal of policy and of developmental strategy does not seem to be forthcoming, and even if it were, it would not solve the problems of the households whose conditions of extreme poverty would prevent their response to improved economic incentives. Direct nutritional interventions must be undertaken urgently to assist the households

with severe malnutrition and in current crisis conditions to improve the chances for survival of their children, to improve their current and future health, and to seek solutions to their dietary and income problems.

The priority groups which were defined based on analysis of the 1984 data were the day laborers and subsistence and small commercial farmers of the Sierra; the Southern and Central Sierra are the most pressing as are the problems in the highlands of Cajamarca and La Libertad Departments. There were also significant pockets of malnutrition and poverty in both the Northern Coastal areas and the Jungle. In these groups, 135,063 households had a child in a crisis situation which required immediate attention. Additionally, more than half of the households with children in a crisis condition in Peru belonged to these groups. The rural households in the priority groups urgently need community based assistance to :

1. Improve the dietary intake of all family members through:
  - a. the distribution of foods such as parboiled and precooked cereals, powdered milk, oil and fortified sugar for home consumption, and
  - b. increasing the production of locally produced foods, especially potatoes, for consumption at home.
2. The management of illnesses at the household level, particularly the care and feeding of children with diarrheal disease.
3. Improvement in the sanitation of the environment through the use of latrines, confining of animals, and adding sleeping areas to the homes.
4. Improving the access to and the use of water resources for human consumption or for use in agriculture.
5. Enhancing child feeding practices as a supplement to breast feeding.
6. Promoting improved child spacing and maternal health in general.
7. Maintaining the coverage and currency of vaccinations against childhood diseases.

These actions must be taken in the context of very poor coverage and access to public services of all kinds. Accordingly, the households and their communities must be the principal providers of solutions for their nutritional problems. To reach these households with information, material resources and services, there will be a need to use existing institutions and to place higher reliance on the private sector, schools, churches, the military, the police, agricultural intermediaries and traditional health providers, particularly in the Sierra and the Jungle.

While the problems of the urban areas were not as pressing as those of the rural areas at the time of the survey in 1984, certain functional groups in the urban areas require specific assistance. In particular, construction workers, skilled and unskilled workers and the petty vendors need assistance from broad based programs in health and sanitation. In 1984, these urban groups represented approximately 23,501 households with a child in a crisis situation and an additional 85,824 households with a severely stunted or chronically malnourished child.

In order to provide the assistance which is urgently needed to the households with a child in a crisis situation, a major shift in the philosophy and deployment of the health system (public and private) and of the public service agricultural agencies will be required. Additional financial and commodity resources are also necessary to assist the private sector and the public sector in its reorientation and redeployment. Simultaneously, the biases in the structure of economic incentives must also be addressed. All of the above actions suggest a key role for USAID involvement at all levels: project, program and policy. The actions undertaken by USAID thus far in health, water and sanitation, food and feeding, and agricultural development have undoubtedly helped to improve the situation and to prevent more damage from the droughts and floods of the recent years. The proposed child survival program is a desperately needed initiative. It is hoped that its resources and other USAID resources can be used to strongly emphasize the need in the Sierra and the other rural areas because more than three times as many persons live under crisis conditions there than in the urban areas, and almost all indicators showed that **even the worst groups in the urban areas were better off than the best groups in the rural areas.**

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