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NUTRITION ASSESSMENT FOR COSTA RICA

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CHAPTER I
SUMMARY AND CONCLUSIONS

A. Methodology for Assessing Nutritional Status and Causal Factors

In May 1975 a joint working group composed by TA/N representatives, a consultant from INTECH, USAID staff and GOCR officials, prepared a Scope of Work for the Nutrition Sector Assessment. That document was subsequently utilized by the USAID as guidance in carrying out the assessment. Certain elements identified in the workscope outline were not included in the assessment document because they were found to be unfeasible or because we later discovered that the data sources were unreliable. Furthermore, the assessment document does not follow exactly the order suggested in the workscope.

The basic methodology used for determining nutritional status and causal factors consisted in the tabulation and analysis of the Nutrition Survey conducted by the Ministry of Health in January and February of 1975. The survey was made among children 0-5 and pregnant or lactating mothers in 41 communities throughout the country, of which 65% are rural and 35% urban. 30 of these communities are the same ones surveyed by INCAP in 1966. Detailed information on urban/rural definition and size of the communities is contained in Annex A attached.

The survey included data on anthropometry, hemoglobin, lactation, and food consumption habits. These were the factors used for direct measurement of malnutrition. In order to relate these direct indicators with other environmental and socio economic factors, the USAID extracted a separate set of indicators from the 1973 census and other sources; i.e. population; land utilization; food production and on-the-farm consumption; sanitation; water; school attendance; mortality; access to health services, and morbidity.

All of the above indicators were tabulated at the district, regional and national level. To obtain this breakdown it was necessary to make a series of special tabulations which are listed in Annex B.

The USAID then prepared 41 profile tables, or one for each district surveyed. These were then summarized in 5 regional tables which are attached as Annex C.

The regional definition used is the one established by the Ministry of Health. It should be noted that the GOCR has many regional definitions and the one employed by the MOH varies substantially from the definitions used by other agencies.

Subsequent to the preparation of the regional profiles (Annex C) the USAID made three separate analyses of the data on malnutrition and related factors. One analysis was done manually and is contained in Annex D "Comparative Indicators by Health Programmatic Region". The other was done by computer and is described in Annex E "Analysis of the Factors Affecting Malnutrition at the District Level in Costa Rica". A third interpretation of the survey is the one contained in Annex F "Prevalence of Malnutrition in a Community".

B. Nutritional Status, Causal Factors and Malnutrition in Costa Rica

Costa Rica has a long history of peaceful economic development, characterized by a lively concern for social progress, as evidenced by its impressive gains in education and health. This tradition, combined with a growing awareness of the social implications of technological development, has led the GOCR in recent times to further strengthen the social orientation of its policies in order to expand the benefits of development to the "poorest of the poor", essentially in the rural areas.

In the process of defining this strategy the GOCR has taken the position that childhood malnutrition constitutes the country's most severe social problem.

Despite its impressive record in public investment in social development, and its relative well being, Costa Rica continues to have a high percentage of malnourished children. The 1975 MOH survey shows 53% malnutrition among children 0-5. Although the imported methods used to measure malnutrition may be considered unrealistic in the Costa Rican context, there is still substantial evidence that childhood nutrition has improved very little, if at all, despite general progress in health.

C. Resumé of Past and Present Programs

That relatively high malnutrition prevails in Costa Rica is partly explained by the inefficacy of traditional nutrition programs in the country. These have achieved insignificant coverage of pre-school children,

and have supplied totally inadequate nutrients to the poorer schools. Thus, traditional feeding programs have not benefitted the neediest children to any meaningful extent.

The National Nutrition Program initiated by the GOCR with resources from the Social Development and Family Assistance Law constitutes the first serious attempt to mount a large-scale, coordinated attack on the causes of malnutrition. In addition to well balanced feeding of vulnerable groups, the program contemplates considerable investments in rural water systems, latrines, preventive health care, sanitary improvement of rural housing and other interventions which indirectly improve nutritional conditions.

D. The Social Development and Family Assistance Law

The Law, originally envisioned as purely an income supplement mechanism through payment of cash subsidies, was substantially revised by the present administration and in the legislative process. As passed the Law creates a broad and varied program of income distribution with emphasis on delivery of services to the marginal population. It identifies nutrition as the priority problem of the poor and established special tax revenues to fund the programs identified in the Law.

The most significant characteristic of the Law is that it gives major emphasis to rural health and nutrition services as primary instruments for achieving beneficial change among the poor.

E. Definition of Target Group

In designing programs to implement the Law the GOCR recognized that the problems of socio-economic marginality vary by location and region. They also vary according to the availability of basic health and sanitation services in each area. Therefore, the GOCR defined different target groups and different strategies for the execution of its proposed nutrition and sanitation interventions.

Of particular importance is the fact that it has included as a specific target group the rural population living in communities of less than 500 inhabitants. These communities in the past have been excluded from Costa Rica's development programs to the extent that they generally lack even the most rudimentary services. They represent approximately 35% of the country's population and encompass some 650,000 inhabitants.

Costa Rica's marginal population has suffered most from the impact of inflation (see Annex G) and the food element of the family budget is the one most severely affected. This has been an overriding factor in the GOCR's decision to utilized food not only as one of several nutrition interventions, but also as a method of income redistribution.

F. Food Supply

A major consideration in a large scale program which seeks to eliminate childhood malnutrition, is whether the country can meet the additional induced demand for food from local production, or must increase imports.

A food balance analysis for Costa Rica shows that the country produces a surplus of nutrients. If further shows that Costa Rica achieved the highest per capita increase in food production in Latin America from 1962 to 1972. The recent experience with price incentives for agricultural crops production has been very good and Costa Rica for the first time in 1975 has reached self-sufficiency in the production of rice and beans. In the case of rice there is a considerable surplus available for export. Costa Rica undoubtedly has the potential to supply the quantity of nutrients required for the program. However, it is probably more economical to import certain commodities (e.g. corn) while exporting agricultural products in which Costa Rica has comparative advantages.

G. External Assistance

Having established a criteria for selecting the target groups, the GOCR further defined, within the limitations of the Social Development and Family Assistance Law, the programs and interventions eligible for financing under the Law. Essentially, these include initial investment requirements and permanent operating costs of delivery systems for an integrated nutrition, sanitation and preventive health program. The GOCR also identified as essential to its strategy a complex system of support activities needed to assure the rational investment of the tax resources and to measure the achievement of goals and objectives, Among these supporting elements are major initiatives in the fields of management and administrative reform; research; information systems; training; education and certain types of specialized technical equipment needed mainly for the research and information elements. In addition, research and capital investment are required in the area of food technology, e.g. creation of a local production capability for nutritious low-cost blended foods similar to CSM or WSB.

The GOCR has determined that it requires external assistance for these elements and has requested an AID loan to finance them.

CHAPTER II
HEALTH AND NUTRITIONAL STATUS - CAUSAL FACTORS

A. Introduction

During its colonial period, the Costa Rican province was benignly neglected by the Spaniards who ruled Central America from the Capitanía General in Guatemala. Being remote, disease ridden, and unpromising in terms of the Spaniards' prime economic interest (gold), they allowed the European immigrants to this hinterland to eke out their existence in primitive fashion. Unlike other colonial regions, where great Crown land grants became the basis for creation of national landed oligarchies, Costa Ricans were mostly subsistence farmers, working small parcels which they claimed as their own. Poor and largely uneducated, they had to work hard to survive, and were guided by strict rules of ethics and morals. Thus, Costa Rica evolved into a nation of self-reliant small holders, who were receptive to ideas of a democratic society. As a result, there has always been less class differentiation and greater stability than in other ex-Spanish colonies. Of course, the Costa Rican economy was later transformed by the development of coffee and bananas for export, which generated substantial wealth and the nucleus of a self-made economic elite. But, even though ownership of land and capital became more concentrated, Costa Rican politics continued to be oriented toward the pursuit of democratic government, equality of opportunity, and social progress. Such aspirations have motivated every Costa Rican administration to some extent, and constitute the priority goals of the present government.

Despite its tradition of socially progressive policies, Costa Rica remains a relatively poor country with serious unresolved problems described elsewhere in this Assessment. However, there have been significant achievements, especially in education, social security, and health. For example, by the turn of the century, primary education had long been compulsory and free. Consequently, illiteracy has been reduced to low levels and elementary school attendance is now almost universal. Preventive health measures also have been emphasized from the beginning of Costa Rica's organized public health system. As capability increased over the years, public health authorities substantially expanded potable water supplies, waste disposal facilities, immunization, and treatment of intestinal parasites, especially in urban areas.

During the early 1940's legislation on minimum wages, fringe benefits, housing and health services was passed. In those years the need to improve the diet was already recognized. The influence of the American school of thought and of the Institute of Nutrition of Central America and

Panama generated attention to nutrition by all governments since 1952. Initially, the authorities opted for Nutritional Recuperation Centers and development of human resources. More recently, the National Nutrition Clinic was created and greater emphasis was placed on centers of food distribution for preschool children and mothers.

Legislation has been passed in the last few years requiring addition of iodate to salt, fortification of sugar with Vitamin A, and of bread with iron, and of milk and other foods with other nutrients. Last December the Social Development and Family Assistance Law was enacted. Under this legislation, a 3% sales tax and a payroll tax contributed mainly by the middle and upper socio-economic sectors, will be allocated for services to the most needy, namely, the rural population, including those hamlets and villages with less than 500 sparsely settled inhabitants. (See Chapter VI on the Target Group.)

B. Factors Determining an Adequate Nutrition

The following factors interact in a chain reaction to determine a good nutrition: food availability, food intake and food utilization, as illustrated and defined in Figure 1 on the following page.

Many variables affect food availability, of course, including changes in production, systems of food storage, marketing and channels of distribution. (See Chapter VII on Food Supply.)

Food intake is determined mainly by the economic capability of the family, its level of education, and cultural patterns. Obviously, the purchasing power of the family is of paramount importance. In this regard, we note that the 1973 census on income contains no information on the salaries of 30% of Costa Rican families. Thus, the income of this sizeable element of the population is unknown, but it is a reasonable assumption that many of them are rural people with low incomes. Furthermore, 30 to 47% of the people have an annual income of less than ₡1,600 ($187), an amount considered minimal to adequately support the nutrition of a person in Costa Rica.

Regarding education, primary schooling in Costa Rica has a long tradition and illiteracy is estimated at only 12%. Secondary and higher education are also expanding rapidly. The availability of radios and television sets and distribution of newspapers is the highest in Central

Figure 1

FACTORS DETERMINING A GOOD NUTRITION

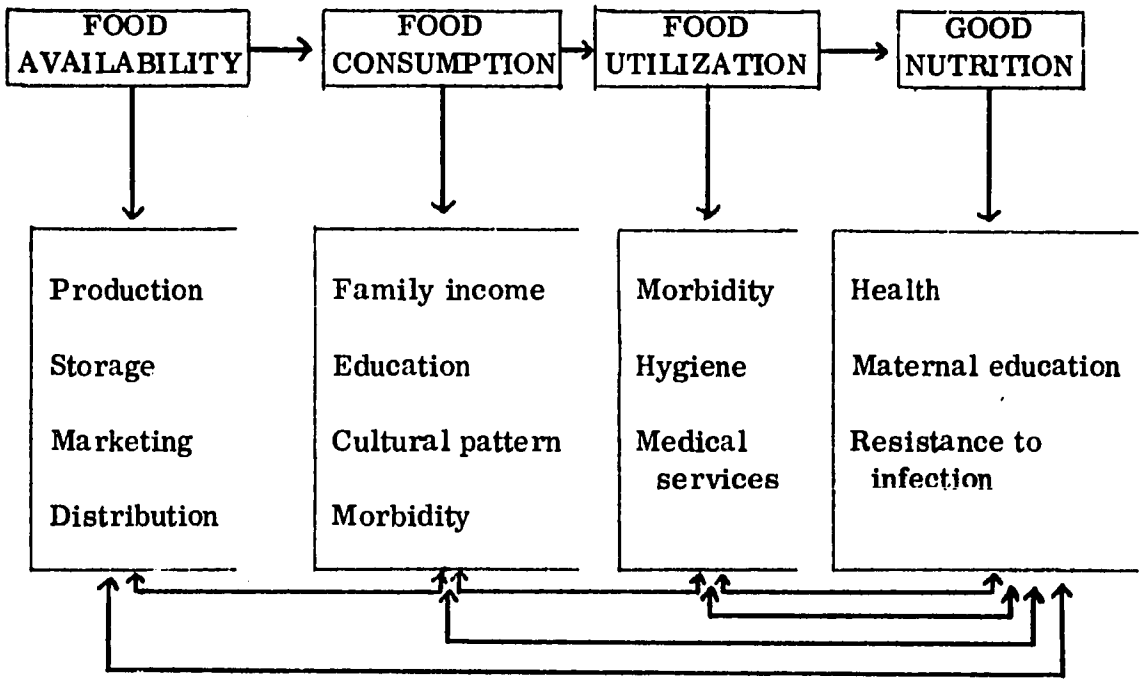


Table 1

ANNUAL PER CAPITA INCOME
(Colones*)
Costa Rica, 1973

Income in Colones	US$ Equivalent	Urban	Rural
Unknown		22.8**	33.7**
Less than 1600	(Less than $187)	30.8	47.5
1600 - 2600	($187 - $304)	16.0	10.6
2600 - 3600	($304 - $421)	8.5	3.5
Over 3600	(Over $421)	21.9	4.7

** Percent of persons

America, which suggests that the use of mass media for promotion of nutrition and health would be highly effective.

As concerns cultural patterns, the Costa Rican society has developed a high propensity for increased access to social and material benefits and for the improvement of health and welfare. While significant sectors of the rural population still depends on rice and beans, with very little animal protein and other foods, the tendency is to diversify the diet which increases the probability of improvement of the caloric and protein content. Table 2 summarizes the frequency of consumption of foods eaten on a daily basis. Data are for the whole population. The behavior of children under 5 years, however, shows greater deficiencies in that they eat significantly fewer foods than older persons.

With regard to morbidity, Costa Rica has made impressive progress in its reduction. Malaria has been virtually eradicated; less than 200 cases occurred last year of which two thirds were imported from neighboring Central American countries. The evolution of mortality figures illustrated (Table 3) for selected years is evidence of slight improvement in nutritional status, as deaths due to diseases commonly associated to malnutrition have decreased. Such changes are due to preventive health measures and better care systems as well as general economic and social development.

C. Food Utilization

The main determinant of whether food is properly digested, absorbed and utilized is the presence or absence of infection and, to a lesser extent, other types of stress. Infection, even if asymptomatic, causes a variety of functional alterations that impair utilization of nutrients, by interfering with digestion, absorption and synthesis, and increasing losses of nitrogen, vitamins and electrolytes.

Infection, therefore, plays a paramount role in the etiology of malnutrition and anemias. The development of adequate systems of hygiene and environmental sanitation are, of course, essential to the nutrition of the population.

In this regard Costa Rica has been relatively advanced in the control of infectious diseases through education and sanitary measures. Intensive latrine and fly control programs have been implemented by several administrations and are now conducted on a permanent basis. Costa Rica fulfilled

Table 2

FOODS CONSUMED ON A DAILY BASIS
FREQUENCY OF PERSONS
Costa Rica, 1975

Food	Urban	Rural
Rice	96.3★	97.1★
Sugar	94.8	92.9
Coffee	93.1	93.3
Lard	88.5	92.8
Beans	88.1	92.0
Bread	86.9	60.7
Fresh cow's milk	79.1	65.1
Fruits	57.1	33.3
Eggs	52.2	43.3
Tortillas (maize)	48.8	51.5
Meats (all)	45.4	16.5
Crackers and biscuits	39.4	24.9
Butter	39.5	14.3
Ice cream	36.6	16.9
Bananas and plantains	34.5	22.8
Vegetables	26.8	13.4
Margarine	26.8	19.0
Cereals	22.4	16.3
Beans broth	20.5	32.3
Panela's "fresco"	19.3	37.3

★ Percent persons consuming food daily.

Table 3
INFANT MORTALITY BY CAUSE - 1952-1973

Cause	1952/1956 #	1952/1956 %	1958/1962 #	1958/1962 %	1963/1967 #	1963/1967 %	1968/1972 #	1968/1972 %	1973 #	1973 %
*Gastritis, duodenitis, enteritis and colitis	4,060	23.4	5,068	25.9	5,668	26.2	4,439	26.0	606	26.0
*Pneumonia	1,012	5.8	1,686	8.6	1,840	8.5	1,837	10.6	191	8.0
*Infections of the newborn (including diarrheas)	638	3.7	1,091	5.6	1,465	6.8	3,733	22.3	597	25.4
Tetanus	-	-	-	-	-	-	-	-	61	2.5
*Bronchitis	897	5.2	956	4.9	1,096	5.1	729	4.2	83	3.5
*Respiratory infections	-	-	-	-	-	-	-	-	26	1.1
Birth lesions, post natal asphyxia	583	3.4	850	4.3	1,013	4.7	N/A	N/A	N/A	N/A
Congenital malformations	372	2.1	608	3.1	877	4.0	802	4.6	195	8.1
*Whooping cough	328	1.9	300	1.5	309	1.4	128	0.7	32	1.4
*Influenza	253	1.5	378	1.9	244	1.1	165	1.0	-	-
*Measles	-	-	163	0.8	246	1.1	267	1.5	-	-
Malaria	252	1.5	-	-	-	-	-	-	-	-
Helminthiasis	-	-	-	-	-	-	-	-	28	1.2
Meningitis	122	0.7	146	0.7	237	1.1	270	1.6	26	1.1
**Other illnesses of infancy	3,286	19.0	2,807	14.3	4,399	20.3	N/A	N/A	N/A	N/A
**Unknown causes	2,956	17.0	2,996	15.3	1,942	9.0	1,652	9.9	207	8.8
**Other illnesses	2,493	14.4	3,013	15.4	2,198	10.1	2,649	16.9	278	11.8
Accidents, poisoning and violent causes	68	0.4	119	0.6	128	0.6	101	0.6	18	0.7
TOTALS	17,320	100.0	19,573	100.0	21,662	100.0	16,772	100.0	2,348	100.0

NOTE: The above data represents only those deaths that were certified by physicians, meaning that the child was under medical care, either in a hospital or at home, at the time of death. In 1972, 57.2% of all deaths registered had been medically certified. This means that in 42.8% of the cases the cause of death was unknown. This situation is more prevalent in the small rural communities with no access to medical attention. The cause of death is entered in the death certificate only if it has been previously recorded by a physician in the medical certification of death. Malnutrition per se is not listed among the death causes shown above. This is due to the fact that Costa Rican physicians are not trained to look for nutritional causes of death either primary or secondary. However, diarrheas and gastro-enteritic infections which are among the principal causes of death shown above, are in many cases malnutrition related. Also other diseases *, not normally fatal, cause the child to succumb because of malnutrition. Furthermore, there is a considerable percentage of deaths ** listed as unknown or other causes which may in some cases also be related to malnutrition. This is particularly important due to the fact mentioned above in which physicians in Costa Rica never list malnutrition as a cause of death.

SOURCE: Ministry of Health, Statistical Department.

the goals for water supply set at the Punta del Este Conference by the target date. The new goals established at the Santiago Conference in 1970 probably will be met by 1975. Immunization procedures have been conducted on a permanent basis in the last 10 years and recently are beginning to reach the more remote areas of the country as attested by the low morbidity rate for measles, whooping cough, diphtheria, tetanus, and poliomyelitis.

D. Resumé and Comments

Costa Rica has distinguished itself in Latin America by an accelerated rate of progress evidenced in better health. A long tradition of political stability, and national priorities for education, delivery of health services and other forms of social development, facilitated by the relative homogeneity of the population and the small geographical area, have permitted measurable gains in health. Reliable statistics have accumulated in a systematic fashion over the past decades, enabling fairly accurate interpretation of changes. In recent times, two nation-wide nutrition surveys permitted an assessment of the nutritional status of children. In 1920 infant mortality was of the order of 250 per 1,000. This figure has steadily declined over the years, and more abruptly in the last three years, to reach a low in 1973 of 43 infant deaths per 1,000. Some improvement in nutrition was evident on a national basis from the significant gain in weight, and more importantly in height, as well as by decreases in mortality due to malnutrition and infectious diseases classically associated with malnutrition. ✱ These changes are significant because the improvement has been effected within a democratic system, rather than through coercive measures. The legislation on "Asignaciones Familiares", as well as other significant interventions, are further evidence of Costa Rica's commitment to constant enhancement of the well being of all its people.

Given the ambitious goals of these new programs, and the complexity of planning and implementing them, it is now essential to establish systems of surveillance and evaluation of the various kinds of interventions to determine their effectiveness. The introduction of such "quality control" systems into the policy-making and programming processes could be decisive in the creation of a capability to substantially eliminate childhood malnutrition within a relatively short time. And, if Costa Rica is successful in this endeavor, it will become an important laboratory and model for other nations.

✱ However, malnutrition remains a serious problem in poor rural communities, as illustrated in Chapters II and III, and Annexes C, D, and F.

CHAPTER III
MALNUTRITION IN COSTA RICA

In attempting to estimate the magnitude of the malnutrition problem in Costa Rica we must consider subjective as well as scientific evidence.

As concerns subjective evidence, there are opinions, observations, and judgements made by professionals in many fields that relate to the care and education of children in Costa Rica. For example, USAID staff have travelled extensively throughout the country and inquired specifically of doctors, teachers, nurses, social workers and Peace Corps Volunteers what they consider to be the principal problem affecting children. Without exception the answer has been: malnutrition. Moreover, the National Primary School Teachers' Union (ANDE) has publicly stated in the press that poor nutrition is the main health deficiency of primary school children. An average of 60% of these children fail to pass their grade annually and there is a high incidence of repeaters. Rightly or wrongly, teachers believe that inadequate nourishment is an important cause of educational failure.

Such subjective views, whatever their validity, have become a major tenet in the perception of many Costa Ricans about their country's fundamental problems. This, together with other direct and scientific evidence, has caused the GOCR to formulate policies based on the premise that childhood malnutrition is the most serious manifestation of the larger social problem called "marginality" or "the social gap". President Oduber chose the theme of malnutrition, and the need to attack it, as a central plank in his platform during the last campaign.

This widespread perception of malnutrition among children as a severe national problem, even when based on "conventional wisdom" rather than expert studies, should not be dismissed lightly. It exists as a result of day-to-day experience of thousands of individuals throughout the country, many of whom are directly occupied in the care, feeding, and education of children.

There are, however, some respectable (though not impeccable) scientific indicators of the prevalence of high degrees of malnutrition among pre-school age children.

The 1975 Ministry of Health survey, which used the Gómez/Iowa standards of measurement, shows malnutrition ranging from 43.2 to 62.5% in the five health regions of the country. Furthermore, between 39 and 60% of deaths among children 0-5 are considered to be related directly or indirectly to malnutrition, i.e. the principal causes of death are diseases which usually would not be fatal to well-nourished children.

The Ministry of Health accepts the findings of the 1975 survey because it is the only source of data available. We have relied largely on the same data in this assessment, and for the same reason. Some critics contend that the survey findings overstate the severity of the problem because the

Gómez/Iowa scale was not designed explicitly for Costa Rica. Other critics suggest that these data probably underestimate the degree of childhood malnutrition because the communities surveyed are not representative of the smaller, poorer communities where 35% of the population lives. For present purposes, we are proceeding on the pragmatic assumption that both kinds of criticism cancel each other out, in which case the 1975 survey results are good enough as rough approximations of the nutritional status of Costa Rican children.

Clearly, however, the advent of the national nutrition program has created an urgent requirement for more reliable techniques of measuring nutritional conditions. In this regard, there is currently strong interest among Costa Rican scientists to devise a set of standards that truly represents the anthropometric characteristics of Costa Rican children. The objective is to rely less upon, and eventually eliminate the use of imported criteria for measuring child malnutrition. Dr. Miguel Gómez, an outstanding Costa Rican demographer, and author of "Country Profiles for Costa Rica", is designing a research project which will eventually produce realistic Costa Rican anthropometric standards. Until such a definition is available, and has been employed in new studies, we can only say that the percentages of malnutrition which have been utilized thus far by the Ministry of Health, INCAP, USAID and others, are merely indicators of the nature of the problem as measured against standards, which are probably unrealistic to some extent. The case against reliance on the age/weight data in the 1975 survey has been stated by Leonardo Mata, a Costa Rican scientist of world reknown. Dr. Mata made an analysis of the 1975 MOH data, relating it to the 1966 INCAP statistics and utilizing a different system of measurement by determining patterns of "stunting and wasting." His conclusions are quoted below:

"The analysis of the 30 communities surveyed both in 1966 and 1975, by weight for age, height for age, and weight for height showed improvement in weight and even more markedly in height. Because the change in height was more marked than that in weight, the proportion of children with weight for height deficits appeared larger in 1975. Hence, the importance of using more than one criterion in assessing the nutritional status of the population, particularly when measurements were taken 9 years apart and they are used to interpret possible changes in nutrition.

The proportion of overweight children in 1975 was twice that of 1966; the gain in height attests an improved nutrition, the weight for height ratio is evidence that most children are thinner now than they used to be in 1966.

The classification of 1975 children by a combined criterion of "wasting" and "stunting" gives a different order of priorities for, thus, approximately the same number of children as in 1966 would require immediate nutritional attention. Three times more "wasted" children occurred in 1975 and would appear as a second priority. However, since the apparent "wasting" is the

result of a marked increase in height, the priority should be to treat only the more "wasted" of the group. Significantly few were "stunted" in 1975, and consequently more well-nourished ones are found this year.

Despite the fact that more or less representative samples of the urban and rural population were examined in the nutrition surveys conducted in 1966 and 1975, no scientific judgement can be advanced for approximately 600,000 people distributed in sparsely populated settlements of less than 500 inhabitants. Therefore, the nutritional situation in the truly rural segments of Costa Rica likely is worse than in the rest of the population for whom data are available.

Although the frequency of malnutrition has declined, it still remains high, and represents the most important health problem of the nation. At present about 25% of all children under 5 years of age have overt deficit in weight, height, or both. A significant number of children with malnutrition attend health centers, outpatient clinics and hospitals, constituting the most pressing problem of all. Contrary to other ailments, which can be easily prevented or cured with specific measures, the child with malnutrition requires complex management techniques, since the causative factors are intimately related to socio-economic factors, malnutrition tends to be chronic, to recur, and to have an attached high mortality all of which are a burden for health plans and national development."

To summarize, the availability of both direct and indirect indicators whether they are based on high imported criteria or lower standards from one specific scientist, and whether they are derived from subjective observations by laymen or scientific determination by professionals, all consistently demonstrate the existence and prevalence of relatively high rates of nutritional deficiency. At the same time, there is reliable evidence of substantial improvement in general health and sanitation. This apparent inconsistency further illustrates the need for research on these questions, particularly in view of the large investment which the GOCR will make to reduce both nutrition and its environmental and cultural determinants.

CHAPTER IV
RESUME OF PAST AND PRESENT NUTRITIONAL ACTIVITIES

I. Feeding Programs

A. Maternal and Child Health

This program has been operated by the Ministry of Health with the support of CARE PL-480 commodities. The PL-480 program will terminate in FY1976. Its maximum coverage has been 32,300 recipients representing approximately 17% of the target group. Accordingly, the majority of children under 5 years of age and lactating or pregnant mothers who need nutritional assistance, have never been served by a feeding program.

Of the actual beneficiaries under this program, 30% have been fed at the centers and 70% have been taking the food home. Although this program has existed since 1951 and, over the years, several nutritional surveys have been conducted among Costa Rica's pre-school population and mothers, such studies have never recorded whether the people surveyed had ever participated in a feeding program either in a center or at home. Thus, it is impossible to determine whether direct feeding has had a significant impact on the nutritional status of the beneficiaries in the MCH category.

We do have general indicators, however, such as the 1966 INCAP survey which showed 57% malnutrition in this group and the 1975 MOH survey which shows 53%, broken down as follows:

	1966 INCAP	1975 MOH
1st degree	43	41
2nd degree	13	11
3rd degree	1	1
TOTAL	57%	53%

Assuming that these two surveys are reasonably valid, the problem of malnutrition among children 0-5 continues to be serious, and even though there has been a slight improvement, we have no evidence that this improvement was due to direct feeding programs. It is a safe assumption, however, that a program of such limited coverage could not have achieved a significant impact on the nutritional status of the target group.

In sum the MCH program has served only a small fraction of the population, and the nutritional status of this segment has never been measured separately from the rest of the population. But malnutrition in this age group continues to be high. Moreover, the available nutritional surveys were conducted almost entirely in communities of more than 1,000 inhabitants which have some type of health, sanitation, or nutritional infrastructure. Thus, we have no useful data on the nutritional condition per se of children living in smaller communities. However, the study Typology of Rural Communities (see Chapter VI) demonstrates that such villages have almost none of the facilities essential to remedy the environmental causes of malnutrition. Therefore, we must assume that in general, undernourishment in these areas is more severe than in the communities covered by the surveys.

B. School Feeding

This program has been operated by the Ministry of Education with support from CARE PL-480 commodities. It has had extensive coverage reaching up to 355,000 children, or almost 100% of the enrollment in public primary schools.

The contents of the diet provided under this program has varied greatly according to the financial capability of the PTA's in each school. The meals served under this program are a combination of the PL-480 commodities plus fresh foods purchased by the PTA. Consequently, in the schools attended by the poorest children where the PTA has little or no funds, the program has relied completely on the PL-480 commodities. Generally, however, the PL-480 input (CSM/CSB) provides only 10% of the protein needed by a child of school age. Therefore, we conclude that the nutritional impact on these poorer and needier schools has been minimal.

In resumé, the school feeding program has had wide coverage but its efficacy varies enormously from one school to the other. The children which need most a nutritional supplement have not received adequate assistance. The PL-480 input for this program is also scheduled to terminate in FY76. Accordingly, the poorest schools which have maintained their meager feeding programs solely with the PL-480 commodities would have to cease such operations altogether in the absence of other measures. However, the GOCR intends to remedy the situation with resources from the new Social Development Law, and children in the neediest schools will receive two nutritionally adequate meals per day.

II. Food Fortification

There are three food fortification actions operating in Costa Rica.

A. Fortification of flour with iron, which started in 1959.

B. Iodization of salt, initiated in 1972.

C. Fortification of sugar with vitamin A, begun in early 1975.

The first two interventions doubtless have been responsible in part for the drop in the incidence of anemias and endemic goiter. The third is too recent to have caused any impact. The Ministry of Health jointly with the National Health Research Institute are designing an evaluation of vitamin A sugar fortification to be initiated within the next few months.

III. New Orientation in Nutrition Programs

As noted, there is no technical or scientific evidence by which to ascertain the effects of the traditional programs described above, but we believe that they have had little beneficial effect on the nutritional status of Costa Rican children, especially the poorest and most vulnerable strata. Comparing the results of the 1966 and 1975 nutritional surveys, we find only a small decrease in the overall percentage of malnutrition. The incidence of third-degree malnutrition continues to be the same and the second-degree malnutrition has dropped by only one or two percentage points. Therefore, it is apparent that the traditional programs must be radically revised to broaden coverage and nutritional value and, more important, orient them more toward the environmental causes of malnutrition. It is within this concept that the GOCR has designed its new national nutrition program financed with resources generated by the Social Development and Family Assistance Law. As the following budget indicates, the emphasis of this program in its initial phase is oriented to attack basic sanitary, environmental and educational deficiencies whose prevalence, particularly in the rural areas, has heretofore reduced or neutralized the impact of direct feeding and other actions in nutrition.

National Nutrition Program - 1975

Sub-Programs	Amount Budgeted in US$ Equivalents
Preventive Health and Nutrition Preventive rural health care; nutrition education and pre-school feeding; latrine installation; MCH programs; Day Care Centers; training of rural health and nutrition workers; health education; research and evaluation Executing Agency: Ministry of Health (MOH)	$ 3,456,458
Construction of Rural Water Systems Executing Agency: National Water Authority (SNAA)	2,888,673
Purchase and Distribution of Food Executing Agency: National Production Council (CNP)	1,567,056
Nutrition Education and School Feeding Executing Agency: Ministry of Education (MOE)	1,686,903
Local Community Food Production (Technical Assistance) Executing Agency: Ministry of Agriculture (MAG)	50,949
Nutrition Centers Construction Executing Agency: Ministry of Transport (MOPT)	2,400,543
Food Production Cooperatives (Technical Assistance) Executing Agency: National Cooperative Development Institute (INFOCOOP)	20,968
Sanitary Improvement of Rural Housing Executing Agency: Institute for Social Aid (IMAS)	2,082,000
Community Organization and Vocational Training Executing Agencies: National Community Development Administration (DINADECO); National Cooperative Development Institute (INFOCOOP); and the National Apprenticeship Institute (INA)	575,000
TOTAL	$14,728,550

The budget breakdown shown above represents 66% of the entire amount of funds collected through the Social Development and Family Assistance Law (3% sales tax and 1% payroll tax) during 1975. Since 20% of the tax revenue is automatically earmarked for a special social security pension plan for indigent persons, of the funds remaining (roughly 16.8 million dollars), 83% has been allocated to programs which are designed to improve the nutritional conditions through both direct and indirect health and sanitation measures. It should be noted, however, that the proportions of resources allocated to each sub-program in the 1975 budget doubtless will change substantially in future years. For example, the $1.5 million allocated for food purchase in 1975 obviously does not correspond to annual requirements of a fully operational feeding program. It represents only the amount of food to be purchased in the last 3 months of 1975. Moreover, investment in construction (water supply systems, latrines, nutrition centers, etc.) will decline over the next few years as requirements for physical facilities are satisfied. Thus, the pattern of resource allocation in the longer term will shift toward a much higher proportion of operating costs necessary for the actual delivery of services and commodities, and maintenance of the several delivery systems.

In any event, the most significant aspect of this program is that the GOCR has chosen nutrition among many alternatives as a principal tool to bring about the improvement of the well being among the poorest strata of the population and for bringing about the social transformation of the lowest income groups. This concept of social development is further elucidated below in a direct translation of parts of the official GOCR social policy statements which have formed the basis for the Social Development and Family Assistance Law.

CHAPTER V
POLICY, PHILOSOPHY AND SOCIO ECONOMIC PROJECTIONS OF THE SOCIAL DEVELOPMENT AND FAMILY ASSISTANCE LAW

Background

The Social Development and Family Assistance Law has its origins in the proposed "Law for Family Subsidies" submitted to the Legislative Assembly during the Administration of President José Figures (1970-1974). The proposed bill had been drafted by President Figueres and by the former Minister of Labor Lic. Danilo Jiménez .

The bill contemplated an eminently distributive regime of family subsidies in cash whose amount would be established in accordance with the monthly family income, the size of the family, and the number of children. During the present administration the proposed bill was substantially modified, giving priority to a new concept not previously expressed in the Law, i.e. comprehensive Social Development, without omitting the direct re-distributive element i.e.: the Pension Plan for non-contributors under the Social Security system.

The Law was enacted by the President of the Republic, Lic. Daniel Oduber and the Minister of Labor and Social Security Sr. Francisco Morales on December 31, 1974, and published in the Official Daily the 28 of that month. The regulations pertaining to the Law were published in the Official Daily on March 27, 1975.

Priority

Priority will be given to those programs which directly or indirectly improve nutrition, eliminate parasites, and prevent certain transmissible diseases, in view of the grave effects caused by these serious health problems among child population, principally rural.

Problems Relative to Marginal Population

The total population of Costa Rica shown in the January 1, 1974 Census was 1,905,338.

Taking as indicators the general characteristics of marginal population groups it has been determined that 43% of the total population (819,295) can be classified as marginal. Of this figure the majority are living under

conditions of extreme poverty. Even though marginality does not always appear under the same patterns there are a series of indicators such as the following which determine sub-standard conditions:

1. Subsistence farming combined with low wages determines marginality in the rural areas.

2. The migration of labor from the rural areas into the cities, which in turn cannot integrate itself to the productive life of the country except in seasonal occupation and jobs which under-utilize its capabilities.

3. Other indicators are used, such as monthly family income, land ownership, employment, the number of people in the family, and their educational level.

4. Housing conditions, health conditions, the general environment and the ownership of supplementary basic goods are also taken into account.

5. The magnitude of the problem of marginal population in Costa Rica has compelled the government to establish a social policy with immediate aggressive and far-reaching actions in order to attack the causes and effects of this problem.

It cannot be expected that the State, utilizing the same standards, principles, and resources available up until now, can effectively remedy and bring about a permanent solution to the problem. It is necessary to create, innovate and restructure parts of our institutional framework in order to adequately achieve the goal of demarginalization of this significant portion of our population.

The application of measures consistent with this concept must be, and in effect is the principal aspiration of the government and it is for this reason that it has undertaken an enormous effort with great social implications such as the Social Development and Family Assistance Law. The goals that the government may adopt, with the support of all citizens, will constitute the framework for the immediate formulation of a national social development plan, based on Costa Rican criteria, which in turn will operate within an overall social policy that is revolutionary, creative and conducive to broad social justice.

The Government's Program of Social Policy

Among the basic objectives proposed by the present administration in the field of social policy are the following: (GOCR Programs 1974-1978).

1. To improve the income and standard of living of the poorest Costa Ricans, thus reducing the distance which separates them from the rest of the population, in order to bring about a reduction in shortest possible period of time in the social gap which still exists. This social gap reflects to a great extent an unequal distribution of opportunities created by the development process.

2. To further multiply the sources of wealth and production and bring about a definitive transformation of production systems in order to accelerate the establishment of the material foundations on which Costa Rica's social and cultural development will be built and to reach a reasonable degree of self-sufficiency in food products and agriculturally based raw materials.

3. To complete the physical and economic integration of the country and to strengthen the development of its various regions, in order to overcome the inequalities that exist and to prevent theexodus of rural inhabitants to the cities.

The social problems which still prevail in our country are principally based on and derived from the following conditions:

1. The continuation of a cultural, economic, educational and social order which has allowed the existance and growth of a marginal population which does not participate in the general development process of the country.

2. The application of advanced technology to the country's economic development which has exacerbated the disequilibrium between the rural and urban environments, thus widening the social gap.

3. The absence of social development programs specifically conceived to deal in an integral manner with the true causes of marginality in Costa Rica.

4. The existence of weak organizational structure at the level of rural communities which has not permitted these groups, and this poor

population, to establish their identity and strengthen their political and organizational structure sufficiently to enable them, jointly with the State, to confront the problems of underdevelopment and marginality.

In view of the panorama described above, the government seeks to orient its actions in the field of social development in consonance with spirit of the Social Development and Family Assistance Law.

Socio-Economics Implications of the Law

The Social Development and Family Assistance Law is a viable instrument for the development of the government's social policy because its conception and purpose permit the execution of economic and social development programs through investment in the fields of education; nutrition and food; employment creation; housing; protection of children, mothers, old people and invalids, as well as job training. The Law is especifically addressed to the marginal population, and is considered to be the first operational legal framework which seeks to resolve social and economic problems by mounting a large scale attack on the causes of the social characteristics of our marginal population.

Consequently, during the present Administration the government is promoting, jointly with public sector institutions, the following principles and supporting actions:

1. Effective inter-institutional coordination in order to bring about efficiency and the rational utilization of existing resources in support of actions taken by the Direction General of Social Development and Family Assistance in the implementation of established programs.

2. Efficient utilization of resources from official institutions such as the Social Security Agency, the Office of the Attorney General, and the Office of the Controller General in order to establish and manage the financial and operational controls of the program to be executed.

3. Strengthen and promote new support programs for marginal rural communities, in order to enable them to achieve self-sufficiency and thereby share with the government the responsibilities for their own development and that of the country.

4. The recuperation of investment made in infrastructure using Social Development funds (housing, water systems, etc.) in order to re-

invest them in the same kinds of programs under the control and management of representative institutions.

5. Avoid and reduce bureaucratization of human resources in the application of this Law, through inter-institutional coordination, the efficient use of existing resources and the participation of local communities and organizations affected by the Social Development Program.

6. Achieve through investment in education, training, and the acquisition of land and other production goods, better organization of farmers, housewives, and youth in order to increase local production of basic foods, the preservation of food and the establishment of agro-industries of broaden coverage, all of which will be carried out within a formative process of cooperative organization.

7. Enhance the physical and mental capabilities of the population benefitted under the Social Development Program, through its various delivery systems, thereby assisting them to become a vigorous and effective resource in the process of integral development.

CHAPTER VI

DEFINITION OF TARGET GROUP

In defining the target group for programs under the Social Development and Family Assistance Law, the GOCR is utilizing several definitions of marginality which vary according to geographic location, income level, degree of physical isolation from public services, and other characteristics which are indicative of socio-economic marginality. Thus, for example, the programs grouped under the rubric of "Health, Food and Nutrition" are designed to benefit different segments of the population, (see table 1) i.e.:

1. Target group for feeding programs: Within this category the target groups include: preschool age children, and pregnant and lactating mothers who will be covered by feeding programs(consisting of two meals per day) to be implemented in communities of all sizes both urban and rural, including the children who live in communities of less than 500 inhabitants which have never been served by a feeding program before. In the school feeding category, the program, also consisting of two meals a day, will be implemented in communities selected on the basis of low-income, poor sanitation, and otherwise deficient public services in health and general well being. The program is designed to cover both urban and rural communities which meet these criteria.

2. Target Group for Environmental Sanitation Actions: This target group is the marginal population living in rural communities of less than 500 inhabitants. Environmental measures programmed for this group include water systems, latrines and sanitary improvements of housing.

3. Target Group for Preventive Health Care: The Law provides funds for delivering preventive health services in nutrition centers, sanitary units, dispensaries, and health posts. By definition, this means that the target group will cover rural communities of up to 2000 in population. At the same time, preventive services will be provided to communities under 500 inhabitants.

These definitions of target groups represent the GOCR's current thinking. They may be refined and narrowed during later phases of planning and assessment. In any event, the major consideration in terms of our criteria is that nutrition and health services will be extended into the poorest of the poor rural areas, i.e., communities of less than 500 inhabitants which have historically been outside the reach of almost all public services.

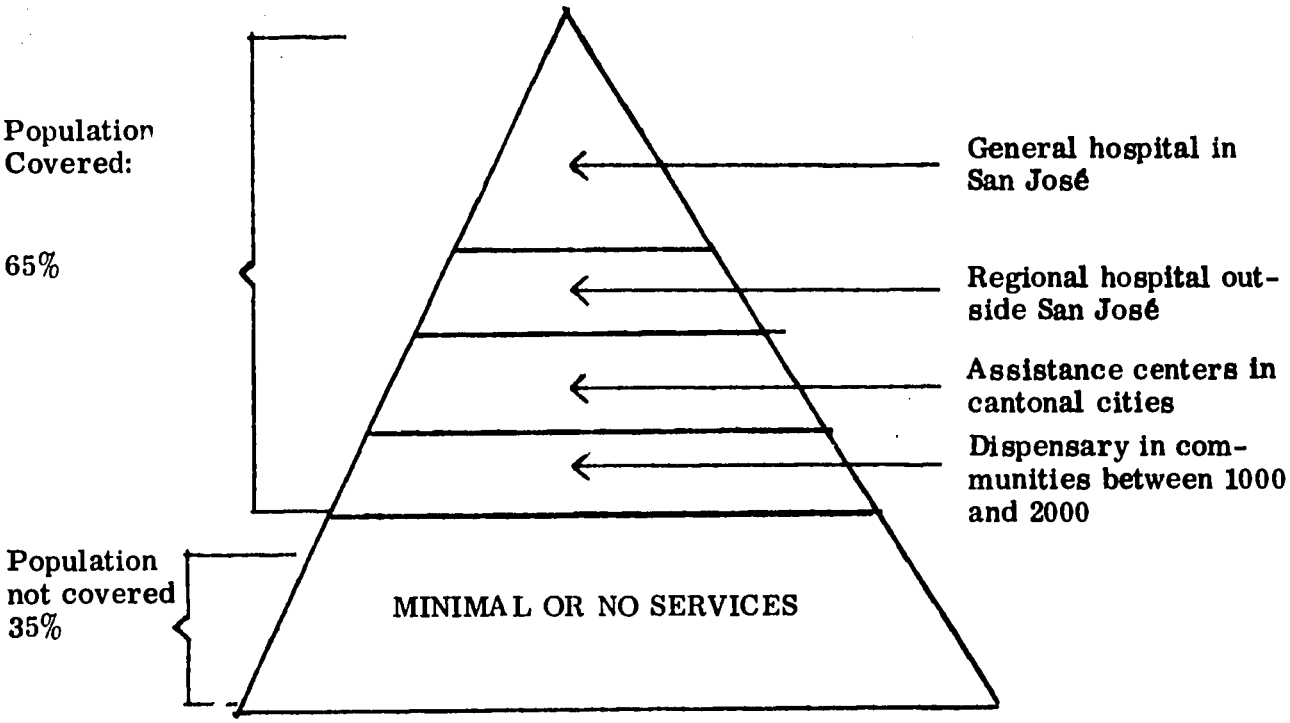
This segment of the population, which represents approximately 650,000 people (35% of the total population) is what may be described as

the Costa Rica about which little is known because most of the available nutritional, health, and socio-economic indicators about rural people have been derived from communities larger than these, i.e., towns with 1500 or more inhabitants. Recently, however, an AID-financed study entitled Typology of Rural Communities, and done by the GOCR Office of Community Development (DINADECO) with technical assistance from AITEC, has produced the first indicators on the status of the population in these villages of less than 500 inhabitants. Some of these indicator are:

- Only 7% have electricity.
- 43% have schools.
- Only 5% are visited by a mobile health unit.
- 2% have an agricultural extension agent.
- None has a CNP store (estanco).
- 20% have medium or high migration rates.
- 64% have up to 10% unemployment.
- 19% have between 11 and 20% unemployment.
- 58% have no industry at all.
- 68% are farmed by small and medium size farmers.
- 33% have seasonal labor migration.
- 75% of the workers earn less than $40 per month.
- 9% have health, nutrition and social welfare committees.
- None has a doctor.

This target group has been chosen due to its socio-economic marginality and because the basic policy of the present administration is to reach this segment of the population with services which heretofore have been available only in larger communities. It is significant that nutrition and health have been chosen as the first priority service to expand to these areas.

The hierarchy of public services in the fields of nutrition and health in Costa Rica is illustrated below:



The lowest 35% consists of approximately 3,000 small villages with a total population of about 650,000 people. The MOH has divided this target group geographically into 220 "health areas", of which 110 have been identified and health posts have been built in them. They are to be staffed with a nutrition assistant, an auxiliary nurse and a rural health assistant. The plan projects that all 220 areas will be reached by 1978. The precise coverage by the end of 1976 is described in table 2. For 1977, the areas have been identified but the villages to be included have not yet been selected.★ However, in general terms the coverage will proceed as indicated below:

Year	Population Covered	# of Health Areas (Cumulative)	# of Villages (Cumulative)
1974-75	311,056	110	1,676
1976	108,522	150	2,222
1977-78	230,422 (Est.)	220	3,000 (Est.)
TOTAL	650,000 (Est.)		

★ A map is available upon request, showing the areas designated for coverage by 1977.

A health "area" is really a location where the health post will be established and which in turn provides service to a number of adjacent small villages. A health post is a multi-service installation where preventive health care, nutritional surveillance, vaccinations, sanitary supervision and basic information gathering functions are performed. The educational aspect of the health post is of particular importance in matters relative to dietary habits, feeding patterns, (lactation) hygiene, and general environmental sanitation.

In sum, the GOCR has made a major (and highly ambitious) policy decision in selecting this target group and this instrument (health and nutrition) as the most important and direct means of initiating the integration of the marginal population into the development process.

The goal will be difficult to achieve but the most fundamental prerequisites have already been created: (a) a determination, supported by law, to move toward this objective; (b) the beginning of an intensive planning effort; and (c) a permanent source of financing, also guaranted by legislation. However, the GOCR fully recognizes that a number of elements essential to success of the program are not immediately available. These are the elements for which the GOCR has requested assistance through an AID loan. (See the Interim Report)

Table 1

GENERAL STRUCTURAL FRAMEWORK OF GOCR DEFINITION OF TARGET GROUPS, INTERVENTIONS, AND COMMUNITIES TO BE COVERED BY NATIONAL NUTRITION PROGRAM.

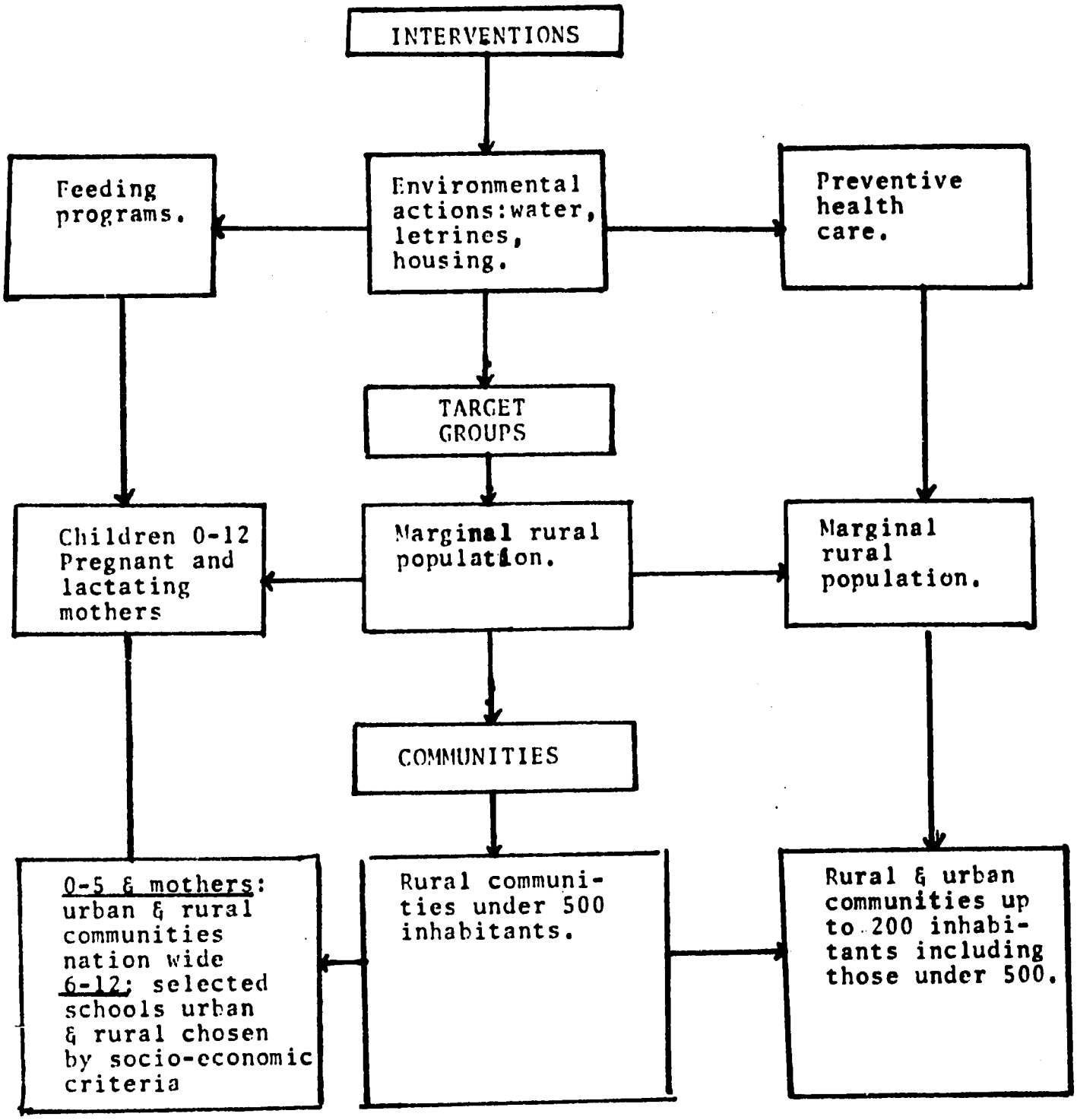


Table 2

TARGET GROUP COMMUNITIES AND SIZE OF POPULATION ACCORDING TO YEAR OF COVERAGE

1974-1975 Health Area 1/	Cantón	Population Coverage Health Area	# of Villages Covered	Average Size of Population Per Village
1. Matapalo	Aguirre	3548	24	147
2. Bijagual	Acosta-Parrita	2080	16	130
3. Sabanillas	Acosta	3654	18	203
4. San Miguel	Puriscal-Parrita	2186	13	168
5. Salitrales	Puriscal	2096	16	131
6. La Gloria	Puriscal	2385	13	183
7. San Gabriel	Turrubares	1577	19	83
8. Bijagual	Turrubares	923	13	71
9. Jacó-Puntarenas	Puntarenas	1641	14	117
10. Tárcoles	Puntarenas	1771	27	65
11. Venecia	San Carlos	3130	12	260
12. Pital	San Carlos	3963	15	264
13. San Fco. de la Palmera	San Carlos	3374	13	259
14. Los Chiles	San Carlos	3430	15	228
15. Santa Rosa	San Carlos	4722	14	337
16. Boca de Arenal	San Carlos	3280	17	192
17. El Tanque	San Carlos	4261	20	213
18. Santa Clara	San Carlos	5441	21	259
19. Guacimal	Puntarenas	2769	21	131
20. Pozo Azul	Abangares	2620	19	137
21. Manzanillo de Puntarenas	Puntarenas	2798	22	127
22. Colorado	Abangares	3537	22	160
23. Quebrada Grande	Tilarán	2637	12	219
24. Arenal	Tilarán	3264	8	408
25. Tierras Morenas	Tilarán	2771	10	277
26. Bijagua	Upala	2923	14	208
27. Guayabo	Bagaces	2205	15	147
28. Ortega	Santa Cruz	2256	14	161
29. Cartagena	Santa Cruz	3366	21	160
30. Villareal	Santa Cruz	3300	31	106
31. Paraíso	Santa Cruz	2313	18	128
32. Marbella	Santa Cruz	2319	19	122
33. Nosara	Nicoya	1879	7	268
34. Sámara	Nicoya	2839	13	218

Health Area 1/	Cantón	Population Coverage Health Area	# of Villages Covered	Average Size of Population Per Village
35. San Pedro de Zapotal	Nandayure	3652	21	173
36. Bejuco	Nandayure	2207	14	157
37. Jabillas	Nandayure	2134	17	125
38. Jicaral	Puntarenas	3799	20	189
39. Lepanto	Puntarenas	2157	17	126
40. La Fresca	Puntarenas	2448	18	136
41. Manzanillo de Arío	Puntarenas	1659	18	92
42. Cóbano	Puntarenas	2531	21	120
43. Pochote	Puntarenas	1368	19	72
44. Paquera	Puntarenas	2338	19	123
45. Quebrada Honda	Nicoya	3917	21	186
46. Platanillo	Pérez Zeledón	3335	28	119
47. Rivas	Pérez Zeledón	4236	11	385
48. Pejibaye	Pérez Zeledón	3900	16	243
49. Concepción	Buenos Aires	2201	15	146
50. Volcán	Buenos Aires	2634	19	138
51. Buenos Aires	Buenos Aires	3434	15	228
52. Maíz de los Boruca	Buenos Aires	2899	13	223
53. Río Brujo	Buenos Aires	2374	16	148
54. Potrero Grande	Buenos Aires	2120	20	106
55. Jabillas	Buenos Aires	2120	18	117
56. Chánguena	Buenos Aires	1098	10	109
57. Punta Mala	Osa	3520	17	207
58. Sierpe	Osa	3180	33	96
59. Tinoco	Osa	3398	15	226
60. Amubri	Talamanca	2610	7	372
61. Daytonia	Talamanca	1274	26	49
62. Cahuita	Limón	2533	18	140
63. Pandora	Limón	3731	26	143
64. La Bomba	Limón	2248	24	93
65. Cimarrones	Siquirres	3626	27	134
66. La Francia	Siquirres	3961	13	304
67. Pocora	Guácimo	3523	12	293
68. Río Jiménez	Guácimo	4390	15	292
69. Guácimo	Guácimo	3230	10	323
70. Jiménez	Pococí	4288	13	329
71. La Rita	Pococí	4054	5	810
72. Cariari	Pococí	4221	6	703
73. Roxana	Pococí	4137	4	1,034
74. Monterrey	San Carlos	3559	25	142

Health Area 1/	Cantón	Population Coverage Health Area	# of Villages Covered	Average Size of Population Per Village
75. San Rafael de Guatuso	Guatuso	4053	28	144
76. Aguas Calientes	Guatuso	3085	14	220
77. Upala	Upala	3408	12	284
78. San Isidro	Upala	2519	9	279
79. México	Upala	2038	13	156
80. San José	Upala	3675	16	229
81. 27 de Abril	Santa Cruz	2099	20	104
82. Cerro Azul	Nandayure	1543	8	192
83. La Tigra	San Carlos	1557	8	194
84. Carolina Tica	Pococí	4038	10	403
85. El Jardín	Pococí	3883	10	388
86. Santa Elena	Puntarenas	1250	10	125
87. Isla Chira	Puntarenas	792	1	792
88. Fortuna	Bagaces	1455	4	363
89. Matina	Matina	4090	17	240
90. Chomes	Puntarenas	1014	8	126
91. Piedades Norte	San Ramón	1934	6	322
92. San Rafael	San Ramón	3607	8	450
93. San Isidro	San Ramón	1275	3	425
94. Candelaria	Palmares	770	2	385
95. Peñas Blancas	San Ramón	3551	11	322
96. Tapezco	Alfaro Ruíz	1650	6	275
97. Santiago	San Ramón	1608	9	178
98. Piedades	San Ramón	2311	15	154
99. Angeles Sur	San Ramón	2359	12	196
100. Zapotal	San Ramón	728	6	121
101. Guaitil	Acosta	2303	9	255
102. Palmichal	Acosta	2141	6	356
103. San Pablo	Turrubares	2328	21	110
104. San Pedro	Pérez Zeledón	3750	16	235
105. San Rafael	Pérez Zeledón	5432	20	271
106. Naranjito	Aguirre	2026	20	101
107. Esterillos	Parrita	3032	15	202
108. Bebedero	Cañas	3872	23	168
109. Río Cuarto	Grecia	2987	15	199
110. Hojancha	Hojancha	5091	14	363
Sub-Total		311,056	1,676	

Health Area 1/	Cantón	Population Coverage Health Area	# of Villages Covered	Average Size of Population Per Village
1976				
111. Pila Angosta	Hojancha	3336	12	278
112. La Legua	Aserrí	2062	9	229
113. San Juan	Tobosi Norte	4991	12	415
114. Bataán	Matina	4754	12	396
115. Colonia San Rafael	Pococí	4380	8	547
116. Barra del Colorado	Pococí	2043	20	102
117. Buenos Aires	Horquetas	1518	8	189
118. San Miguel	Sarapiquí	3087	14	220
119. Puerto Viejo	Sarapiquí	3528	18	196
120. Boca de Río San Carlos	San Carlos	1076	11	97
121. Venado	San Carlos	1507	11	137
122. Caimital	Nicoya	4123	14	294
123. Santa Cecilia	La Cruz	3571	13	274
124. Las Vueltas	La Cruz	2196	14	156
125. Quebrada Grande	Liberia	1452	20	72
126. Cañas Dulces	Liberia	1359	25	54
127. Sabalito Coto Brus	Coto Brus	2924	14	208
128. Limoncito	Coto Brus	3523	20	176
129. Agua Buena	Coto Brus	3729	18	207
130. Aguas Claras	Coto Brus	3090	17	181
131. Las Mellizas	Coto Brus	3658	13	281
132. Bajo Los Reyes	Coto Brus	3400	11	309
133. Paso Canoas	Corredores	4330	7	618
134. La Cuesta	Corredores	1380	18	76
135. Bahía Pavón	Golfito	3680	20	184
136. Villa Briceño	Golfito	2487	11	226
137. Río Claro	Golfito	3772	12	314
138. Puerto Jiménez	Golfito	2295	16	143
139. Agudita	Osa	809	10	80
140. San Lorenzo	Tarrazú	2819	20	140
141. San Carlos	Tarrazú	3037	18	168
142. Copey	Dota	1477	13	113
143. Los Chiles o Medio Queso	Los Chiles	3327	16	207
144. Botija	Los Chiles	2000	6	333
145. Canto Negro	Los Chiles	1813	12	151
146. San Ramón	Pérez Zeledón	2866	9	318
147. Santa Rosa	Pérez Zeledón	2927	11	266

Health Area 1/	Cantón	Population Coverage Health Area	# of Villages Covered	Average Size of Population Per Village
148. Buena Vista	Guatuso	2226	14	159
149. Candelaria	Abangares	1970	19	103
Sub-Total		108,522	546	
TOTAL 1974-76		419,578	2,222	

1/ Each area covers between 5 and 25 villages each with less than 500 population.

CHAPTER VII
FOOD SUPPLY

I. Food Balance Table

Before discussing the production and trade of individual crops it may be useful to refer to the Food Balance Table for Costa Rica, which gives a global view of the food production question, defined in terms of human nutrient requirements.

Based upon the 1973 Costa Rica census data and INCAP publications we were able to construct this food balance table, disaggregated to the regional, provincial, cantonal, and district level. Nutrient availability for each geographic unit was calculated by applying values for nutritional content of each food to the production of that food as reported in the 1973 Agricultural Census. Nutritional requirements for the same geographic area were calculated by applying standards of human nutritional requirements to the population of that area, broken down into several age/sex categories.

The results show that in 1972 Costa Rica produced over three times its protein requirements and nearly twice its calorie requirements. We must remember that these figures are simple, unadjusted estimates of physical production and average human requirements. To say something about the availability of these nutrients to the Costa Rican population these figures must be adjusted for inter-regional trade, international trade, waste, spoilage, and differences in consumption between the various income classes in the population. One crude adjustment the reader can make is to substract nearly all the nutrients attributed to sugar cane, bananas, and beef, as nearly all of these products are exported. Similarly, imported corn equivalent to a third of national consumption and imports of all wheat consumed make up in part for exports.

The main point to be taken from this table in its present form is that Costa Rica already produces more than enough nutrients to adequately feed its people. The constraints on these nutrients getting to the people are to be found in the system which distributes these products and/or the proceeds from their sale.

II. Trends in Food Production

According to OAS figures, between 1962 and 1972 Costa Rica had the highest percent increase in agricultural and food production in Latin

America. With 1961-65 taken as a base of 100, Costa Rica's agricultural and food production indices in 1972 were 176 and 177 respectively. Adjusting for adverse weather and the energy crisis, this trend has continued from 1972 through the present. Until most recent years this increase was mainly in export products such as coffee, bananas, sugar cane and beef. Since 1971 however, a healthy part of the increase has been in locally-consumed basic foodstuffs.

The most notable example of these is rice, which went from 40,000 metric tons of production (and 2,000 tons of imports) in 1973 to 79,000 tons of production in 1974, with 12,000 tons of exports. With the second harvest of 1975 just getting underway, all predictions are for another record year, with at least 100,000 tons of production and perhaps 25,000 of exports.

Bean production has gone up just as remarkably, from 4,800 tons in 1973 to 13,900 tons in 1974, with further increases to above 16,000 tons expected this year, nearly eliminating the need for imports.

The increases both in bean and rice production are largely the result of substantial increases in the minimum price paid to producers by the CNP (National Production Council).

Corn production has not demonstrated the same trends, even in later years, mainly because it is simply less profitable to grow corn than alternative crops in the areas where corn has traditionally been grown. Trading at international prices, Costa Rica can acquire about four times as much corn as it can grow on an average hectare by growing sugar cane or coffee and selling it. This trend of increasing corn imports may soon be changing, as new areas for large-scale corn production are opening up on the Atlantic Littoral. Newly released corn varieties, selected and tested in Costa Rica specifically for this zone, show promise for spurring considerable increases in corn production.

Production of root crops has been increasing steadily, with large production for export seen in the last few years. The construction of a large yuca-processing facility in San Carlos has augmented demand for this important calorie source.

Vegetable production has been increasing over the period, although not as fast as population. The major constraint in vegetable production is the marketing system and price relationships.

Milk and egg production per capita have increased steadily throughout the last decade, to the point where milk producers at this moment have a surplus on hand.

III. Food Supply and Asignaciones Familiares

The major concern over Asignaciones Familiares and the food supply is whether Costa Rica will be able to meet internally the Program's increased demand for food or will have to import it and thus put further strain on an already precarious balance-of-payments position. Based upon the discussion above, we think it likely that the country will be able to meet most of the increased food demand from national production.

The Food Balance Table demonstrates that the country is already producing all the nutrients it needs. The highly positive response to price increases for rice and beans demonstrates that the basic grains sector is supply elastic, and given the proper incentives can meet national needs.

Looking at the specific agricultural commodities which the program expects to distribute, we can assess the national capabilities to meet the program demands.

A. Basic Grains

As of this year, national production of rice and beans is sufficient to cover national needs, and should without difficulty be able to cover increased future demand stimulated by Asignaciones Familiares, if cost/price relationships are maintained.

Corn production will not cover national requirements, but the expected increases in production from the Atlantic Zone should start to close the gap in the next couple of years.

B. Milk and Eggs

Milk production is already in surplus and should be able to increase if necessary to meet further demand. Egg production can also be expected to respond favorably to increased demand if necessary.

C. Vegetables and Fruits

As noted, the major constraint on increased vegetable produc-

tion is the marketing system and prices. If the Program purchases vegetables in large quantities and provides a dependable market for such products the producers will respond.

Fruit production is more a long-term proposition, although in the short run much of the "backyard" production of these products can be increased simply by improving practices such as fertilization and pruning. Again, if the economic incentives exist.

D. Elements of a High Protein Mix (CSM, etc.)

One large question is how the GOCR is going to replace the CSM mixture which has been distributed under the PL-480 and CARE programs. All three of the ingredients in this mix, corn, soy, and powdered milk, would have to be imported at the present. But research is currently under way at the UCR Food Technology Laboratory to find nationally-produced substitutes for these commodities. Yuca and other root crops, or rice, could replace corn as the basic calorie source. Legumes better adapted to Costa Rica's climate could provide the vegetable protein source, if the very positive-looking effort to foment large-scale soybean production in Costa Rica is not successful. The powdered milk component might also be produced locally, if not eliminated altogether from the mix.

In summary, it appears that although Asignaciones Familiares will increase the demand for food in Costa Rica, it should not result in a substantial increase in the importation of food. Indeed, the increased effective demand which this program represents may be the stimulus agriculture in this country requires.

COSTA RICA: Food Resources, Availability and Needs
By Calories and Proteins

	Calories (in 1,000's)	Proteins (in 100's kg.)
Availability	2,886,897,207	1,039,518,140
Need	1,488,934,918	316,134,336
Balance	1,397,962,288	723,383,804
Availability/Need	1,938	3,288
Available Products		
Vegetable Products	2,338,431,448	293,081,959
Basic Grains	612,269,582	136,978,903
Corn	197,306,118	38,076,619
Rice	377,867,425	74,679,001
Beans	37,096,038	24,223,283
Roots and Tubers	30,407,654	3,695,711
Potatoes	13,036,727	2,743,488
Yuca	17,014,742	911,504
Sweet Potato	356,184	40,718
Garden Vegetables	6,477,717	2,812,224
Onion	1,294,570	381,159
Lettuce	223,277	189,785
Corn on the Cob	1,904,930	775,493
Beet	316,294	124,037
Cabbage	1,207,772	803,633
Tomato	1,146,450	433,792
String Beans	69,572	34,786
Carrot	314,849	69,537
Permanent Cultivations	1,689,276,493	149,595,119
Banana	756,009,176	98,245,249
Green Plantain	29,246,000	312,932
Plantain	71,735,461	6,210,862
Orange	2,389,169	457,500
Pineapple	28,144,298	21,240,980
Papaya	585,132	91,949
Coconut	6,729,105	797,760
Avocado	2,010,187	225,997
Sugar Cane	792,427,960	22,011,887
Animal Products	548,465,759	746,436,181
Products	170,729,569	92,032,124
Milk	141,637,379	71,898,243
Cheese	4,999,123	4,999,123
Butter	1,121,632	20,180
Eggs	19,962,649	15,114,577
Honey	3,008,784	0
Meat	377,736,189	654,404,056
Beef	345,988,599	640,825,378
Pork	24,063,181	6,977,850
Chicken	7,684,408	6,600,828

CHAPTER VIII
REQUIREMENTS FOR EXTERNAL ASSISTANCE AS PERCEIVED BY THE GOCR

The GOCR Ministry of Health fully recognizes that external aid will be essential to creation of adequate capability to plan, monitor, evaluate, and refine the national nutrition program. The Ministry has formulated a tentative prospectus of foreign assistance requirements. The following is a literal translation of the Ministry's current perception of areas and activities for which it will seek external assistance.

I. Management Reform and Development of the Ministry

A. Description of the Problem

The implementation of the national nutrition program, due to its multi-sectoral approach and the complex nature of its projects plus the large volume of the program and the need for coordinated actions among institutions, presents a particularly difficult challenge to institutions dealing with elements of the national food and nutrition policy.

The Ministry of Health, however, is the principal agency responsible for implementation and coordination of the actions proposed under this policy. This task as proposed under the Social Development and Family Subsidy Law represents an enormous challenge which the Ministry is not prepared to meet, under its present administrative and institutional structure.

B. Proposed Actions

In order to develop the institutional capacity of the MOH to assume the efficient implementation of the National Nutrition Program, it is proposed to implement the following actions:

Medium-Term

1. Technical assistance over a three-year period in various fields of administrative development as established in the Ministry's work plan in order to achieve the goals defined in the national health plan.

2. Initiate a training program through scholarships abroad, in-country training and special short courses designed to achieve more efficient operation of the MOH's internal systems.

3. At the end of the three years, a definition will have to be completed of the structural and organizational models as well as procedural aspects at all levels of management, and the necessary actions will have been initiated in other institutions involved in the sectoral strategy.

4. Systematize information mechanisms and decision-making processes, with special emphasis on economic controls and evaluation methodology to allow an on-going process of adjustment and updating in administration and management.

Short-Term

1. Based on macrodiagnosis and terms of reference established in previous stages, develop specific diagnoses in the fields of organic structure, information systems, financial management, personnel management, supplies and organizational development.

2. Design systems models for the above areas, and implement them gradually until their application is generalized, but subject to appropriate evaluations and adjustments.

3. Consolidate organizational structures at the regional level with management and administrative development.

4. Move ahead in developing close linkages among the various elements of management i.e. planning and coordination, information, programming, and evaluation, economic control of the activities, programs and sub-programs in the nutrition field.

5. Develop an evaluation methodology for periodic revision of the program, through a constant interdisciplinary exchange of experiences and the organization of evaluation symposia and seminars.

II. Research

Strategic Research

Description of the Problem

The establishment of a large-scale National Nutrition Program financed by the Social Development and Family Assistance Law presents a series of problems in planning, evaluation, and control. Furthermore if

we take into account the plan's multi-sectoral nature, the planning, evaluation and control functions demand the creation of a supporting infrastructure in research and systems development for programming and information gathering which can provide trustworthy guidance and elements of judgment for the plan's strategic decision-making process.

- Research in Operational Methodology

The main objective of this type of research is to establih statistical data collection mechanisms to permit an evaluation of the activities under the National Nutrition Program. This research is basic in order to measure the global and partial impact of the program. Only systematic evaluation under specific programs such as the ones described below will enable the GOCR to reorient and modify its programs and obtain a better utilization of its resources.

1. Epidemiological surveillance of growth and nutrition in the rural population.

2. Evaluation of health interventions such as:

   a. Food fortification.
   b. Anti-parasite drugs.

3. Development of a statistical evaluation system to measure the general behavior of the target group under various socio-economic and technical conditions.

4. Design, develop and implement an information system for programming and operational control of general nutrition programs at the inter-institutional level.

5. Technical assistance, development, design and implementation of programming and operational control systems for the various institutions participating with sub-programs in the national nutrition program.

Applied Research

This type of research in general terms is long-range and requires the recruitment of a working group of high professional standards and adequate physical facilities, data generating systems, and stable analytical support

of the highest quality. The development of such research must run parallel to the operational methodological research activities described above since a good part of it will provide support to the former. The integration of both types of research will enable the formulation of updated diagnoses of nutritional status and health in the country. Specific research activities under this category include:

1. Prospective study of child nutrition and growth.
2. Study on lactation and weaning.
3. Study on causality and prevention of dearrheas in children.
4. Study of the anthropological and social behavior of the target group.
5. Study of the institutional development of the communities covered by the program.
6. Conceptual study of the interaction between the National Basic Grains Program and the National Nutrition Program.
7. Study on feeding of children under 3 years of age: local foods and means to improve nutrition.

Research Applied to Feeding

Description of the Problem

The goal is to improve the population's nutritional level, and given the need to achieve this goal with local resources, there is an urgent need for research on all possible alternatives for industrialization of foods needed in the diets in the various regions of the country. Accordingly it is imperative to undertake a series of research activities oriented toward food technology, i.e.

1. Study on how to improve the availability of information on food production in the country.

2. Permanent information systems on food commercialization, marketing and storage.

3. Studies designed to increase agricultural production such as, soil composition and nutritive requirements of vegetables, genetic selection of seeds and incentives to increased use of fertilizer, herbicides and pesticides.

4. Research designed to increase animal production, especially coordination of research on animal health and genetic selection.

5. Research on the production and utilization of marine and river resources.

6. Studies and technical assistance for development of unconventional sources of food, including:

a. Formulation of acceptable, safe and low-cost foods with high nutritional content.

b. Determination of acceptability of these foods and the best means to maintain their quality throughout the entire distribution system.

c. Evaluation of the technical feasibility of large-scale processing and production of such foods.

d. Provision of technical assistance to local industries, public and private, in processing and production of these foods, and the installation of one or more processing plants whose feasibility has been previously demonstrated.

Specific means to achieve the above objectives would include, but not be limited to, the following:

e. Evaluation of soybeans, cowpeas, and other legumes and oil seeds with production potential in Costa Rica.

f. Research on carbohydrate sources such as yuca, bananas, potatoes, sorghum, and others already available or potentially available which can serve as substitutes for imported foods.

g. Combine the above sources of protein and carbohydrates to prepare new nutritious foods adequate for the National Nutrition Program.

h. Evaluation of other underutilized sources which may have potential as raw materials in the production of foods for human and animal consumption, thus reducing the country's dependence on imported foods.

i. Local industry will be provided technical assistance to (a) adopt new production and processing techniques; (b) disseminate this information to all others who may benefit from it and (c) introduce these new techniques on a commercial scale.

7. Study on the correction of nutritional food deficits which may be revealed in the diet supplied by the national nutrition program.

III. Training

A. Description of the Problem

A diagnosis of the present situation of humen resources in the nutrition and health sector demonstrates a scarcity of qualified personnel to fill the need for services to the population, especially in the rural areas where the target group is located. The present structure shows a marked concentration of these resources in the larger communities and urban centers. Moreover, there is a serious problem in achieving the adaptation of these types of personnel to the conditions of the rural environment. Accordingly there is an enormous gap in the availability of sufficient numbers of properly trained personnel. The gap also exists at the level of personnel required for field work. In sum, there is a particularly severe shortage of middle and low-level field personnel with paramedic and related training.

The present GOCR strategy of penetration into the more remote areas of rural Costa Rica greatly augments the need to improve the quality and increase the availability of auxiliary field personnel.

B. Objectives of the Project

The goals of the national nutrition and health programs establish as first priority the coverage of remote rural areas with sparce population, which represent 35% of the entire population in the country and are principally communities with less than 500 inhabitants, never before reached by health and nutrition delivery systems. A basic requirement of this penetration strategy is the availability of trained personnel who can be stationed permanently in the field.

C. Specific Training Activities

1. Training of auxiliary personnel to cover 220 rural health areas which include 2,700 schools with feeding facilities, and 500 education and nutrition centers. Each area must have a minimum staff composed of one auxiliary nurse, one nutrition assistant and one rural health assistant.

2. Training of community leaders in basic health concepts in order to enable them to consciously participate in the community's sanitation and health activities.

3. Refresher training for personnel already working in the rural health areas (110 areas in 1975; 150 areas in 1976; 190 areas in 1977; 220 areas in 1978) in order to introduce necessary adjustments based on feedback, information, evaluation, and new programming goals for the plan to penetrate outlying areas.

4. Provide audio visual equipment and other training aids to the auxiliary personnel training centers.

5. Train instructors and supervisors in order to maintain high standards at the operational and supervisory levels.

6. Train personnel from other sectors (schools teachers, community development promotors, agricultural extension agents, etc.) in order to establish uniform criteria in the delivery of services to outlying communities.

7. Evaluate the efficacy of services provided and the reactions of the beneficiaries in order to adjust and improve the program.

8. Produce instruction manuals, guides, booklets, reference materials and other literature needed in the design of comprehensive training courses.

IV. Physical Installations and Equipment

A. Description of the Problem

In order to successfully implement the various elements of the national nutrition program it is necessary to provide certain physical facilities which the GOCR cannot finance with the resources from the Social Development

and Family Assistance Law. Problem areas have been identified in the fields of food storage; food processing; mobile units for delivery of nutrition and health services; and laboratory equipment.

Specific actions:

1. Storage Facilities for Basic Grains

In order to meet the increased demand in the internal consumption of basic grains it is expected that, over the next 5 to 7 years the country must have increased its storage capacity for basic grains by 650,000 qq. It is contemplated that storage facilities will be installed in 4 decentralized locations, namely: Santa Cruz and Liberia in Guanacaste; and Parrita and Palmar in the southern pacific region of Puntarenas. These facilities will include storage, drying, and polishing of basic grains.

2. Food Processing

A series of research activities described earlier in this document are designed to determine the feasibility of installing food processing facilities and will have to be undertaken as a pre-requisite to the investment of funds in this activity. However, it is important to include this as a key linkage in the overall food supply - consumption-fortification strategy of this program.

The feasibility of this plant will be studied in conjunction with the development, selection, and acceptability testing of new foods.

3. Mobile Units

In order to support the training, education and research and food distribution components of the program, mobile units are essential to cover the most inaccessible regions of the rural target population. It is contemplated that both land and water mobile units will be necessary since many of these small villages are located along rivers. The units will be equipped with basic laboratory equipment for taking samples and specimens; preventive medicine supplies; emergency care supplies; and dental care equipment. They will also be able to carry an auxiliary nurse, a nutrition assistant, a health assistant and in some cases a doctor. The units will perform several services: delivery of health services and food; nutritional surveillance, nutritional and sanitary education; and information gathering for the various applied and methodological research activities.

4. Laboratory Equipment

Various types of clinical, immunological laboratory equipment will be provided for the National Health Reserach Institute; the National Nutrition Clinic and the Ministry of Health both at their headquarter and at decentralized field locations.

The National Health Institute and the Ministry of Health will be carrying out the applied and methodological research activities described in this document. The National Nutrition Clinic, in its new building, will develop a training unit for nutrition specialists at various levels and will also undertake clinical research of third-degree malnutrition cases being treated in the clinic.

V. Education

A. Description of the Problem

As previously noted, the priority target group under the National Nutrition Program is the least educated and poorest 35% of the population. They have traditionally been outside the radius of influence of health and nutritional services because they are physically inaccessible and live in communities too small to attract the investment of public funds. Under the new programs designed by the GOCR to cover this population with nutrition and health programs a particularly important element is the need to educate and motivate these communities and bring about a positive attitude of cooperation and participation in the programs.

B. Specific Activities

1. Direct Communication

One method of conveying educational information on nutrition, health and hygiene will be through personal direct communication between the health/nutrition worker and the community. This will include the preparation of information/education/dissemination packages to be utilized by health and nutrition workers in the field. The package would include guidance for the instructor, audio visual aids and other teaching materials.

2. Mass Communication

Utilizing mass media communications a series of campaigns will be designed to deal with specific problems such as early weaning, poor hygiene, use of latrines, promotion of new foods and other issues related to nutritional status.

Mass media coverage in Costa Rica is extensive. 91% of all homes have a radio, 44% have TV and the illiteracy rate is 12%. Radio campaigns at appropriate hours are extremely effective in the rural areas, where early morning listening is widespread.

To implement activities in the above areas certain initial investment is needed in equipment, and technical assistance is required for preparation of radio and TV spots; design of attractive campaigns; preparation of information packages for educational talks, etc.

(N. B.: We reiterate that this summary of external assistance requirements was prepared by the Ministry of Health. Because of previous dialogue with Ministry officials, many (though not all) of the elements included herein are similar to USAID's own perceptions of an appropriate role for external aid in the national nutrition program. However, USAID has not discussed the specific contents of this presentation with MOH or other GOCR officials. Therefore, it does not necessarily represent a definitive GOCR proposal. It is, however, useful as an indication of GOCR views.)

POPULATION SIZE AND URBAN/RURAL DEFINITION OF COMMUNITIES COVERED BY NUTRITION SECTOR ASSESSMENT

		Rural	Urban
Health Region 1:	1. Aserrí	11,653	
	2. Cinco Esquinas		13,385
	3. Concepción	3,846	
	4. Curridabat		9,581
	5. Naranjito	2,287	
	6. Sánchez	872	
	7. San Juan de Tibás		18,670
	8. San Pablo	702	
	9. San Pedro	624	
	10. Vuelta de Jorco	3,029	
	Sub-Total	23,013	41,636
Health Region 2:	11. Arenal	7,382	
	12. Ciudad Quesada		17,027
	13. Desmonte	455	
	14. Jacó	2,959	
	15. Palmares		3,083
	16. Piedades Norte	2,338	
	17. Puerto Viejo	2,274	
	18. San José de la Montaña	2,081	
	19. San Mateo		1,553
	20. Santa Bárbara		2,496
	21. Santa Lucía	1,608	
	22. Santiago	1,946	
	23. Santo Domingo El Roble	2,931	
	24. Zapotal	700	
	Sub-Total	24,674	24,159
Health Region 3:	25. 27 de Abril	10,274	
	26. Chomes	2,378	
	27. La Sierra	1,760	
	28. Las Juntas		5,486
	29. Puntarenas		26,940
	30. Santa Cruz		10,672
	31. Santa Elena	717	
	Sub-Total	15,129	43,098
Health Region 4:	32. Cartago		13,489
	33. Cot	3,492	
	34. Guápiles	7,297	
	35. Peralta	1,708	
	36. Quircot	9,384	
	37. Siquirres		9,799
	38. Turrialba		18,873
	Sub-Total	21,881	42,161
Health Region 5:	39. Palmar Norte	13,660	
	40. Pejibaye	7,981	
	41. Puerto Cortés		7,467
	Sub-Total	21,641	7,467
	TOTAL	106,338	158,521
	Number of Communities	27	14

SOURCE: 1973 Population Census, Dirección General de Estadística y Censos

NOTE: A community is defined as urban if it has public lighting, as primary school, a secondary school, potable water, sewers, etc. which objectively define it as urban, the size of population is not taken into account.

TABULATIONS PREPARED FOR NUTRITION SECTOR ASSESSMENT

Ministry of Health 1975 Nutrition Survey

Anthropommetry

1. Percentage distribution of nutritional status in children under 5 years of age by locality, region and country.

2. Nutritional status of children under 5 years of age by locality, region and country.

3. Percentage distribution of nutritional status of children under 5 years of age by sex, locality, region and country.

4. Nutritional status of children under 5 years of age by sex, locality, region and country.

5. Percentage distribution of nutritional status in children under 5 years of age by age group, locality, region and country.

6. Nutritional status of children under 5 years of age by age group, locality, region and country.

7. Percentage distribution of nutritional status of children under 5 years of age for urban and rural population of localities, regions and country.

8. Nutritional status of children under 5 years of age for urban and rural population of localities, regions and country.

9. Average head circunference in children under 5 years of age according to age in months and nutritional status by locality, region and country.

10. Percentage distribution of children under 5 years of age according to height, and age groups by locality, region and country.

11. Children under 5 years of age according to standard height and age groups, by locality, region and country.

12. Percentage distribution of children under 5 years of age according to weight standards for height by locality, region and country.

13. Children under 5 years of age according to weight standards for height by locality, region and country.

14. Percentage distribution of nutritional status of children under 5 years of age according to age groups of the mothers by locality, region and country.

15. Nutritional status of children under 5 years of age according to age groups of the mothers by locality, region and country.

Pregnant Women

16. Percentage distribution of weight of the pregnant women: insufficient, adequate, overweight, by locality, region and country.

17. Weight of pregnant women: insufficient, adequate, overweight by locality, region and country.

18. Percentage distribution of weight in pregnant women: insufficient, adequate, overweight according to trimesters of pregnancy by locality, region and country.

19. Weight of pregnant women: insufficient, adequate, overweight according to trimesters of pregnancy by locality, region and country.

20. Number of pregnant women in relation to total number of families surveyed by locality, region and country.

21. Percentage distribution of hematological status of pregnant women: deficient, low and adequate levels of hemoglobin by locality, region and country.

22. Hematological status of pregnant women: deficient, low and adequate levels of hemoglobin by locality, region and country.

23. Percentage distribution of the hematological status of pregnant women: deficient, low and adequate levels of hemoglobin for urban and rural population of localities, regions and country.

24. Hematological status of pregnant women: deficient, low and adequate levels of hemoglobin for urban and rural population of localities, regions and country.

25. Percentage distribution of hematological status of pregnant women: deficient, low and adequate levels of hemoglobin according to trimesters of pregnancy by locality, region and country.

26. Hematological status of pregnant women: deficient, low and adequate levels of hemoglobin according to trimester of pregnancy by locality, region and country.

27. Percentage distribution of the three hematological levels of pregnant women in relation to their weight by locality, region and country.

28. Hematological levels of pregnant women in relation to weight by locality, region and country.

Hematology in Children

29. Percentage distribution of hematological status in children: deficient, low and adequate hemoglobin level by locality, region and country.

30. Hematological status of children by locality, region and country.

31. Percentage distribution of the hematological status of children: deficient, low and adequate hemoglobin level according to age groups and sex by locality, region and country.

32. Hematological status in children according to age groups and sex by locality, region and country.

33. Percentage distribution of hematological status of children for the urban and rural population of localities, regions and country.

34. Hematological status of children for urban and rural population by locality, region and country.

35. Distribution of the three hematological levels of children in relation to their nutritional status by locality, region and country.

36. Hematological status of children in relation to their nutritional status by locality, region and country.

37. Hemoglobin average in children under one year of age.

Breast Feeding

38. Percentage distribution of the period of lactation during the first eleven months of the child's life for urban and rural population of localities, regions and country.

39. Period of lactation during the first eleven months of the child's life for urban and rural population of the localities, regions and country.

40. Average of children with and without maternal lactation for urban and rural population of the localities, regions and country.

41. Children with and without maternal lactation for urban and rural population of localities, regions and country.

42. Percentage distribution of causes of weaning for urban and rural population of localities, regions and country.

43. Causes of weaning for urban and rural population of localities, regions and country.

44. Percentage distribution of the children's age at which usually bottle is given for the first time, for urban and rural population by localities, regions and country.

45. Children's age at which bottle is usually given for the first time for urban and rural population by localities, regions and country.

46. Percentage distribution of children's age at which usually food is given for the first time in urban and rural population by localities, regions and country.

47. Children's age at which usually food is given for the first time in urban and rural population by localities, regions and country.

48. Percentage distribution of most frequently utilized foods as first meal for children in urban and rural population by localities, regions and country.

49. Foods more frequently utilized as first meal of children for urban and rural population by localities, regions and country.

Food Habits

50. Percentage distribution of the most frequent schedule of meal periods (breakfast, lunch, dinner) for urban and rural population of localities, regions and country.

51. Percentage distribution of the most frequently consumed foods for breakfast, lunch and dinner and in-between meals for urban and rural population of localities, regions and country.

52. Percentage distribution of daily consumed foods for urban and rural population of localities, regions and country.

53. Percentage distribution of weekly food consumption for urban and rural population of localities, regions and country.

54. Percentage distribution of monthly food consumption for urban and rural population of localities, regions and country.

55. Percentage distribution of foods consumed only by children for urban and rural population of localities, regions and country.

56. Percentage distribution of foods consumed only by adults for urban and rural population of localities, regions and country.

57. Percentage distribution of the food produced totally or partially by the family for urban and rural population of localities, regions and country.

58. Percentage distribution of families with refrigerator and stove with oven by locality, region and country.

59. Families with refrigerator and stove with oven by locality, region and country.

60. Percentage distribution of foods consumed by the entire family for urban and rural population of localities, regions and country.

Cross Tabulations

61. Percentage distribution of nutritional status of children under 5 years of age per ownership of refrigerator by locality, region and country.

62. Nutritional status of children under 5 years of age per ownership of refrigerator by locality, region and country.

63. Percentage distribution of the nutritional status of children under 5 years of age per ownership of a stove with oven by locality, region and country.

64. Nutritional status of children under 5 years of age per ownership of a stove with oven by locality, region and country.

65. Percentage distribution of the nutritional status of children under 5 years of age per period of maternal lactation by locality, region and country.

66. Nutritional status of children under 1 year of age per period of maternal lactation by locality, region and country.

67. Percentage distribution of the nutritional status of children under 5 years of age according to family size by locality region and country.

68. Nutritional status of children under 5 years of age according to family size by locality, region and country.

69. Number of families, number of children according to age groups and number of pregnant women by locality, region and country.

Tabulations Comparing 1966 INCAP Survey with 1975 Ministry of Health Survey

1. Clinical Malnutrition in Costa Rica, Nutrition Survey, 1966.

2. Prevalence (%) of "low" and "deficient" Serum Values of Vitamin A, Costa Rica, 1966.

3. Nutritional Status by Weight for Age, 791 Children under 5 Years, Costa Rica, 1966.

4. Nutritional Status by Height for Age, 791 Children under 5 Years, Costa Rica, 1966.

5. Nutritional Status by Weight for Height, 791 Children under 5 Years, Costa Rica, 1966.

6. Classification of Children, According to Degree of "Stunting" and "Wasting", Costa Rica, 1966.

7. Nutritional Status by Weight for Age, 1910 Children under 5 Years, 30 Localities of Costa Rica, 1975.

8. Nutritional Status by Height for Age, 1910 Children under 5 Years, Costa Rica, 1975.

9. Nutritional Status by Weight for Height, 1910 Children under 5 Years, Costa Rica, 1975.

10. Classification of Children According to Degree of "Stunting" and "Wasting", Costa Rica, 1975.

Socio-Economic Tabulations

1. Balance of food resources of Costa Rica's population - availability and needs in calories, proteins, vitamin A and iron of the products for the programmatic health regions, provinces, cantons and districts.

2. Urban and rural population from 0-5 years of age and 6-12 years of age by sex and age for programmatic health regions, provinces, cantons and districts.

3. Urban and rural female population 15 to 45 years of age for programmatic health regions, provinces, cantons and districts.

4. Attendance to regular educational centers among population 6 to 12 years of age urban and rural by sex and age for programmatic health regions, provinces, cantons and districts.

5. Per capita income distribution of the total urban and rural population in Costa Rica by regions, provinces, cantons and districts.

6. Causes of death - age and sex. Death in children under 12 years of age. "Vital Statistics 1973". By programmatic health regions, provinces, cantons and districts.

7. Causes of death - age and sex. Death in children under 12 years of age. "Vital Statistics 1974". By programmatic health regions, provinces, cantons and districts.

Food Availability

1. Summary of Data Concerning Food Availability for 1950, 1963 and 1973.

   Rice - Number of Farms - Total Cultivated Area (in hectares). Total Production and on the Farm Consumption.

   Tomato - Number of Farms - Total Cultivated Area (in hectares). Total Production and on the Farm Consumption.

   Beet - Number of Farms - Total Cultivated Area (in hectares). Total Production and on the Farm Consumption.

   Cabbage - Number of Farms - Total Cultivated Area (in hectares). Total Production and on the Farm Consumption.

   Lettuce - Number of Farms - Total Cultivated Area (in hectares). Total Production and on the Farm Consumption.

Onions - Number of Farms - Total Cultivated Area (in hectares). Total Production and on the Farm Consumption.

Sweet Potato - Number of Farms - Total Cultivated Area (in hectares). Total Production and on the Farm Consumption.

Sorghum - Number of Farms - Total Cultivated Area (in hectares). Total Production and on the Farm Consumption.

Corn - Number of Farms - Total Cultivated Area (in hectares). Total Production and on the Farm Consumption.

Beans - Number of Farms - Total Cultivated Area (in hectares). Total Production and on the Farm Consumption.

String Beans - Number of Farms - Total Cultivated Area (in hectares). Total Production and on the Farm Consumption.

Carrots - Number of Farms - Total Cultivated Area (in hectares). Total Production and on the Farm Consumption.

Yucca - Number of Farms - Total Cultivated Area (in hectares). Total Production and on the Farm Consumption.

Pineapple - Number of Farms - Total Cultivated Area (in hectares). Total Production and on the Farm Consumption.

Oranges - Number of Farms - Total Cultivated Area (in hectares). Total Production and on the Farm Consumption.

Papaya - Number of Farms - Total Cultivated Area (in hectares). Total Production and on the Farm Consumption.

Potatoes - Number of Farms - Total Cultivated Area (in hectares). Total Production and on the Farm Consumption.

Avocado - Number of Farms - Total Cultivated Area (in hectares). Total Production and on the Farm Consumption.

Plantains - Number of Farms - Total Cultivated Area (in hectares). Total Production and on the Farm Consumption.

Hens and Chickens - Number of Farms - Total Production and on the Farm Consumption.

Beef - Number of Farms - Total Production and on the Farm Consumption.

Pork - Number of Farms - Total Production and on the Farm Consumption.

Milk and Eggs - Number of Farms - Total Production and on the Farm Consumption.

ANNEX C

PROFILES

FOR

COSTA RICA's

FIVE HEALTH

PROGRAMMATIC REGIONS

REGIONAL PROFILE

Region 1 - Región Centro
Communities Aserrí, Vuelta de Jorco, San Juan de Tibás, Cinco Esquinas, San Pablo, San Pedro, Curridabat, Sánchez, Concepción, Naranjito

I. OVERVIEW OF THE POPULATION

A. Population Distribution

Total	64,649
0-5	10,005
6-12	12,836
♀ 15-45	15,815
Others	25,993

B. Income: % <2200 — 54.1

C. Land Utilization:

Total # of Farms	Total Hectare Extension	Cultivated		Uncultivated	
		Has.	%	Has.	%
1,414	19,549	14,830	75	4,719	24

D.

Food	Production	% on-farm Consumption	
Rice	401,131	50,283	12 %
Corn	279,960	129,486	46
Beans	56,437	38,518	68
Potatoes	460	-	0
Bananas	1,579	369	23
Plantain	4,415	485	10
Oranges	7,767	356	4
Pineapple	15,733	1,308	8
Sugar	1,123	65	5

E. Sanitation - Water

	# Houses	# Occupants	Av. # Occupants	% Occupants
Total	11,398	63,581	5.5	100
Sewer	546	2,939	5.3	4
Septic Tank	6,034	32,283	5.3	50
Concrete Slab	3,094	18,416	5.9	28
Wooden Slab	1,115	6,582	5.9	10
Other	27	160	5.9	.2
Public Water System	10,385	57,677	5.5	90
Private Water System	284	2,079	7.3	3.2
Well	106	614	5.8	.9
Public Fountain	32	176	5.5	.27
Other	591	3,902	6.6	6.1
No Sanitary Services	582	3,191	5.4	5

II. OVERVIEW OF THE CHILD POPULATION

A. School Attendance 7-12 years 93 %

B. Nutritional Status:

1°	2°	3°	Total
38	4.3	.9	43.2

Weight for Height

Low	Adequate	Over
22.4	66.1	9.9

C. Infant Mortality: 39% related to nutrition/sanitation.

Causes:

1. Enteritis/other diarrhea 20%
2. Perinatal mortality 18%
3. Congenital 12%
4. Birth complications 12%
5. Pneumonia 10%

D. Breast-Feeding less than 6 months 62.1 %

E. Introduction of Solid Foods: later than 4 mo. 2.7 %

F. Weaning Foods:

6.6 % broth 2.8 % rice
19.8 % bottled 32.1 % fruits
2.8 % cereal

G. Weight of Pregnant ♀:

Insufficient	Adequate	Over
16.7 %	75.0 %	8.3 %

III. OVERVIEW OF CHILD HEALTH CARE

A. Number of births 23,711
B. Received Prenatal Care 81.8 %
C. Premature births 8 %
D. Health facilities available:

1. Hospitals 14
2. Rural Ass. Centers 1
3. Clinics (US & CCSS) 9
4. Puestos/Dispensarios 39
5. CEN 53
6. Mobile Units 1

E. Immunization Program
% vaccinated<1 year
0-1 Population (est.) 16,078

	BCG	DPT	DT	Polio	Typhoid	Chicken Pox	Measles
1 Dose	84	70	3	60	.04	50	29
2 Dose		53	2	46			
3 Dose		46		37			

F. Communicable Diseases Reported

Flu	Malaria	Dysentery	Chicken Pox	Diphtheria	Whooping Cough	Tetanus
4,554	16	194	666	7	396	5

REGIONAL PROFILE

Region 2 - Región Norte

Communities San Mateo, Desmonte, Santiago, Ciudad Quesada, Cutris, Piedades Norte, Zapotal, Santo Domingo, Santa Bárbara, Santa Lucía, San José de la Montaña, Puerto Viejo, Jacó

I. OVERVIEW OF THE POPULATION

A. Population Distribution

Total	48,833
0-5	8,529
6-12	11,490
♀ 15-45	9,800
Others	19,014

B. Income: % <2200 53.8

C. Land Utilization:

Total # of Farms	Total Hectare Extension	Cultivated		Uncultivated	
		Has.	%	Has.	%
2,969	158,655.6	79,337	50	79,314	49

D.

Food	Production	% on-farm Consumption	
Rice	2,541,135	146,724	5 %
Corn	1,182,109	347,949	29
Beans	207,671	109,061	52
Potatoes	13,570	828	6
Bananas	33,240	4,119	12
Plantain	7,850	1,100	14
Oranges	15,919	3,698	23
Pineapple	55,590	3,005	5
Sugar	142,029	290	

E. Sanitation - Water

	# Houses	# Occupants	Av. # Occupants	% Occupants
Total	8,207	48,460	5.9	100
Sewer	0	0	0	
Septic Tank	2,287	12,905	5.6	46
Concrete Slab	3,350	20,654	6.1	42
Wooden Slab	1,382	8,423	6.0	17
Other	93	487	5.2	1
Public Water System	4,875	28,534	5.8	58
Private Water System	820	4,905	5.9	10
Well	910	5,607	6.1	11
Public Fountain	34	175	5.1	.36
Other	1,568	9,239	5.8	19
No Sanitary Services	1,095	5,985	5.4	12

II. OVERVIEW OF THE CHILD POPULATION

A. School Attendance 7-12 years 90 %

B. Nutritional Status:

1°	2°	3°	Total
38.5	11.9	1.0	51.4

Weight for Height

Low	Adequate	Over
34.9	55.6	7.7

C. Infant Mortality: 42% related to nutrition/sanitation.

Causes:

1. Enteritis/other diarrhea 21%
2. Perinatal mortality 14%
3. Congenital 12%
4. Birth Complications 10%
5. Pneumonia 8%

D. Breast-Feeding less than 6 months 52.9 %

E. Introduction of Solid Foods: later than 4 mo. 3.8 %

F. Weaning Foods:

8.3 % broth
14.0 % bottled
3.2 % cereal
1.9 % rice
22.9 % fruits

G. Weight of Pregnant ♀:

Insufficient	Adequate	Over
11.1 %	56.8 %	32.1 %

III. OVERVIEW OF CHILD HEALTH CARE

A. Number of births 7,878

B. Received Prenatal Care 73.3 %

C. Premature births 3 %

D. Health facilities available:

1. Hospitals	5
2. Rural Ass. Centers	1
3. Clinics (US & CCSS)	4
4. Puestos/Dispensarios	74
5. CEN	56
6. Mobile Units	2

E. Immunization Program

% vaccinated<1 year

0-1 Population (est.) 11,280

	BCG	DPT	DT	Polio	Typhoid	Chicken Pox	Measles
1 Dose	76	46	.5	45		29	12
2 Dose		39	.4	35	.6		
3 Dose		31		30			

F. Communicable Diseases Reported

Flu	Malaria	Dysentery	Chicken Pox	Diphtheria	Whooping Cough	Tetanus
3,184	51	145	276	12	126	14

REGIONAL PROFILE

Region 3 - Pacífico Seco

Communities Santa Cruz, 27 de Abril, Las Juntas, La Sierra, Santa Elena, Puntarenas, Chomes.

I. OVERVIEW OF THE POPULATION

A. Population Distribution

Total	58,227
0-5	9,833
6-12	12,651
♀ 15-45	11,909
Others	23,834

B. Income: % <2200 54.0

C. Land Utilization:

Total # of Farms	Total Hectare Extension	Cultivated		Uncultivated	
		Has.	%	Has.	%
2,271	174,916.1	120,715	69	54,200	30

D.

Food	Production	% on-farm Consumption	
Rice	3,450,003	178,696	5 %
Corn	2,520,691	1,106,266	43
Beans	541,790	185,581	34
Potatoes	3,128	690	22
Bananas	358	119	33
Plantain	1,581	458	28
Oranges	24,519	3,914	15
Pineapple	465	250	53
Sugar	87,068	64	.07

E. Sanitation - Water

	# Houses	# Occupants	Av. # Occupants	% Occupants
Total	10,619	57,213	5.3	100
Sewer	1,241	5,519	4.4	9
Septic Tank	3,244	16,148	4.9	28
Concrete Slab	1,375	8,146	5.9	14
Wooden Slab	2,247	13,356	5.9	23
Other	701	3,652	5.2	6
Public Water System	6,873	34,723	5.0	60
Private Water System	442	2,634	5.9	4
Well	1,972	11,676	5.9	20
Public Fountain	64	377	5.8	.65
Other	1,270	7,803	6.1	13
No Sanitary Services	1,811	10,392	5.7	18

II. OVERVIEW OF THE CHILD POPULATION

A. School Attendance 7-12 years 83 %

B. Nutritional Status:

1°	2°	3°	Total
44.4	16.9	1.2	62.5

Weight for Height	Low	Adequate	Over
Infant	58.3	35.8	4.8

C. Mortality: 55% related to nutrition/sanitation.

Causes:

1. Enteritis/other diarrhea 32%
2. Poorly defined state 14%
3. Perinatal mortality 9%
4. Pneumonia 7%
5. Bronchitis 6%

D. Breast-Feeding less than 6 months 29.2 %

E. Introduction of Solid Foods: later than 4 mo. 13 %

F. Weaning Foods:

25.3 % broth 27.3% rice
5.1 % bottled 5.1% fruits
1 % cereal

G. Weight of Pregnant ♀:

Insufficient	Adequate	Over
6.7 %	66.7 %	26.7%

III. OVERVIEW OF CHILD HEALTH CARE

A. Number of births 4,164
B. Received Prenatal Care 51.8 %
C. Premature births 2 %
D. Health facilities available:

1. Hospitals 3
2. Rural Ass. Centers 5
3. Clinics (US & CCSS) 6
4. Puestos/Dispensarios 52
5. CEN 56
6. Mobile Units 3

E. Immunization Program

% vaccinated<1 year
0-1 Population (Est.) 8,658

	BCG	DPT	DT	Polio	Typhoid	Chicken Pox	Measles
1 Dose	87	38		40		24	14
2 Dose		31		30			
3 Dose		26		26			

F. Communicable Diseases Reported

Flu	Malaria	Dysentery	Chicken Pox	Diphtheria	Whooping Cough	Tetanus
4,373	63	790	712		165	30

REGIONAL PROFILE

Region 4 - Región Atlántico
Communities Cartago Centro (Parte Oriental), San Nicolás (Quircot), Turrialba, Peralta, Cot, Guápiles, Siquirres

I. OVERVIEW OF THE POPULATION

A. Population Distribution

Total	64,042
0-5	10,512
6-12	13,761
♀ 15-45	13,718
Others	26,051

B. Income: % <2200 57.3

C. Land Utilization:

Total # of Farms	Total Hectare Extension	Cultivated		Uncultivated	
		Has.	%	Has.	%
1,462	53,880	32,029	59	21,849	40

D.

Food	Production	% on-farm Consumption	
Rice	65,732	7,063	10 %
Corn	899,150	134,564	14
Beans	24,389	6,682	27
Potatoes	2,098,244	11,196	.53
Bananas	1,174,133	1,978	.16
Plantain	8,708	680	7
Oranges	7,674	471	6
Pineapple	4,519	582	12
Sugar	100,649	14	.01

E. Sanitation - Water

	# Houses	# Occupants	Av. # Occupants	% Occupants
Total	11,546	63,350	5.4	100
Sewer	3,468	18,419	5.3	29
Septic Tank	3,386	18,131	5.3	28
Concrete Slab	2,012	12,048	5.9	19
Wooden Slab	2,157	12,377	5.7	19
Other	86	436	5.0	.6
Public Water System	9,448	52,019	5.5	82
Private Water System	820	4,662	5.6	7
Well	383	1,991	5.1	3
Public Fountain	40	248	6.2	.39
Other	855	4,431	5.1	6
No Sanitary Services	437	1,929	4.4	3

II. OVERVIEW OF THE CHILD POPULATION

A. School Attendance 7-12 years 89 %

B. Nutritional Status:

1°	2°	3°	Total
42.8	11.5	1.2	55.5

Weight for Height

Low	Adequate	Over
31.7	56.0	11.3

C. Infant Mortality: 50% related to nutrition/sanitation.

Causes:

1. Enteritis/other diarrhea 28%
2. Perinatal Mortality 13%
3. Poorly defined state 9%
4. Birth Complications 9%
5. Infant Parasites 9%

D. Breast-Feeding less than 6 months 57.4 %

E. Introduction of Solid Foods: later than 4 mo. 12.4 %

F. Weaning Foods:

13.7 % broth 2.7 % rice
17.8 % bottled 20.5 % fruits
% cereal

G. Weight of Pregnant ♀:

Insufficient	Adequate	Over
5.1 %	48.7 %	46.2%

III. OVERVIEW OF CHILD HEALTH CARE

A. Number of births 6,135
B. Received Prenatal Care 72 %
C. Premature births 3 %
D. Health facilities available:

1. Hospitals	5
2. Rural Ass. Centers	2
3. Clinics (US & CCSS)	4
4. Puestos/Dispensarios	39
5. CEN	53
6. Mobile Units	0

E. Immunization Program
% vaccinated<1 year
0-1 Population (Est.) 9,383

	BCG	DPT	DT	Polio	Typhoid	Chicken Pox	Measles
1 Dose	88	44	.2	49=	.3	27	18
2 Dose		34	.04	37	.06		
3 Dose		29		33			

F. Communicable Diseases Reported

Flu	Malaria	Dysentery	Chicken Pox	Diphtheria	Whooping Cough	Tetanus
1,996	12	34	237		197	25

REGIONAL PROFILE

Region 5 - Pacífico Sur
Communities Puerto Cortés, Palmar, Pejibaye

I. OVERVIEW OF THE POPULATION

A. Population Distribution

Total	29,108
0-5	5,826
6-12	6,876
♀ 15-45	5,368
Others	11,038

B. Income: % <2200 39.5

C. Land Utilization:

Total # of Farms	Total Hectare Extension	Cultivated		Uncultivated	
		Has.	%	Has.	%
1,963	73,706	48,525	65	25,176	34

D.

Food	Production	% on-farm Consumption	
Rice	7,779,587	258,786	3 %
Corn	2,441,490	762,126	31
Beans	874,532	254,095	29
Potatoes	0	0	0
Bananas	1,600,916	4,863	.3
Plantain	178,261	5,862	3.
Oranges	10,131	2,676	26
Pineapple	90,041	5,238	5
Sugar	3,037	206	6

E. Sanitation - Water

	# Houses	# Occupants	Av. # Occupants	% Occupants
Total	5,037	28,738	5.7	
Sewer				
Septic Tank	1,462	7,780	5.3	28
Concrete Slab	1,323	7,804	5.8	27
Wooden Slab	879	5,431	6.1	18
Other	121	532	4.3	1
Public Water System	1,197	6,418	5.3	22
Private Water System	1,587	9,097	5.7	31
Well	591	3,286	5.5	11
Public Fountain	55	319	5.8	1
Other	1,607	9,618	5.9	33
No Sanitary Services	1,252	7,191	5.7	25

II. OVERVIEW OF THE CHILD POPULATION

A. School Attendance 7-12 years 87 %

B. Nutritional Status:

1°	2°	3°	Total
45.1	10.4	1.2	56.7

Weight for Height

Low	Adequate	Over
40.5	48.0	10.4

C. Infant Mortality: 55% related to nutrition/sanitation.

Causes:

1.	Enteritis/other diarrhea	26%
2.	Poorly defined states	8%
3.	Pneumonia	8%
4.	Perinatal Mortality	7%
5.	Parasitic Infections	9%

D. Breast-Feeding less than 6 months 59.4 %

E. Introduction of Solid Foods: later than 4 mo. 5.4 %

F. Weaning Foods:

29.7 % broth
8.1 % bottled
% cereal
% rice
16.2 % fruits

G. Weight of Pregnant ♀:

Insufficient	Adequate	Over
16.7 %	33.3 %	50.0%

III. OVERVIEW OF CHILD HEALTH CARE

A. Number of births 3,404

B. Received Prenatal Care 57.2 %

C. Premature births 2 %

D. Health facilities available:

1. Hospitals	5
2. Rural Ass. Centers	1
3. Clinics (US & CCSS)	0
4. Puestos/Dispensarios	24
5. CEN	15
6. Mobile Units	4

E. Immunization Program

% vaccinated<1 year

0-1 Population (Est.) 5,197

	BCG	DPT	DT	Polio	Typhoid	Chicken Pox	Measles
1 Dose	74	63	13	52		46	7
2 Dose		45		44			
3 Dose				43			

F. Communicable Diseases Reported

Flu	Malaria	Dysentery	Chicken Pox	Diphtheria	Whooping Cough	Tetanus
2,750	19	60	214	6	175	7

DATA SOURCES FOR REGIONAL PROFILES

I. A. Population
Vital Statistics by Health Region - 1973

B. Income Census - 1973

C. Land Utilization
1973 Agropecuario Census
Cultivated Lands = Tierras de Labranza
Permanent Crops
Pastures
Uncultivated Land = Forest
Swamps
All other classes

D. % on Farm Consumption
In kilograms : rice, corn, beans, potatoes, banana and plantain
100's of units : oranges
Units : pineapples
Tons : sugar
Source: 1973 Agropecuario Census

E. Sanitation and Water
Census 1973 = Vivienda
Concrete Slab and Wooden Slab = a deep hole over which is placed a small hut (caseta); or an outhouse

II. A. School Attendance - 1973 Population Census

B. Nutritional Status - 1975 Survey

C. Infant Mortality
# of deaths 0-1 in the region - Vital Statistics 1973
Causes: 5 principal causes of infant death by region, not necessarily related to nutrition or sanitation.

III. A. Number of Births
1973 - Hospital Statistics for National Hospital System, Units and Others.

B. Same.

C. Same.

D. Health Facilities Available
October 1974 regional maps of "Health Establishments in the country."
(CEN = from Ministry of Health 19)

E. Immunization Program
1973 Hospital Statistics
(Only BCG is reported at time of birth and therefore according to place of birth).

F. Number of Common Diseases Reported - for the whole population
1973 - Hospital Statistics for National Hospital Systems, Sanitary Units and Others.

ANNEX D

COMPARATIVE INDICATORS BY HEALTH PROGRAMMATIC REGION

	REGION 1	REGION 2	REGION 3	REGION 4	REGION 5
A. POPULATION					
TOTAL	661,215	448,805	277,224	317,366	175,021
Population in Districts Covered by Survey	64,649	48,833	58,227	64,042	19,108
Surveyed Districts as % of Total Population	9%	10%	21%	20%	16%
Range of Population Density	from 0 to 1,200 per square Km.	from 0 to 600 per square Km.	from 0 to 60 per square Km.	from 0 to 120 per square Km.	from 0 to 60 per square Km.
B. INCOME					
% of Total Population Earning less than $254 per year 1/	43.4	54.8	52.5	55.4	41.4
% of Surveyed Population Earning less than $254 per year	54.1	53.8	54.0	57.3	39.5
C. LAND UTILIZATION					
% of Land Under Cultivation	75	50	69	59	65
% of Land Uncultivated	24	49	30	40	34
D. FOOD AVAILABILITY					
Availability in Protein (in 100's kg.)	101,859,577	238,142,441	388,885,572	158,542,704	152,087,844
Requirements of Protein	112,297,349	75,771,612	46,086,509	53,139,747	28,839,281
Balance	-10,437,771	+162,370,828	+342,799,063	+105,402,057	+123,248,563
Availability in Calories (in 1,000's)	231,417,395	724,508,785	616,382,341	773,649,658	540,939,026
Requirements in Calories	526,132,772	356,748,572	218,014,846	251,080,397	136,959,077
Balance	-249,715,377	+367,760,213	+398,367,494	+522,569,261	+403,979,948
Availability in Vitamin A (in grams)	83,823	273,963	397,268	316,953	242,348
Requirements in Vitamin A	199,770	137,042	83,762	95,541	52,293
Balance	-155,947	+136,920	+313,506	+221,411	+190,055
Availability in Iron (in grams)	2,185,734	9,088,678	8,815,369	5,665,210	4,618,679
Requirements in Iron	3,432,986	2,246,100	1,340,097	1,540,074	830,764
Balance	-1,247,252	+6,842,578	+7,475,272	+4,125,135	+3,787,914

1/ $254 per year in 1974 = equal to $150 in 1969.

	REGION 1	REGION 2	REGION 3	REGION 4	REGION 5
E. ON-THE-FARM FOOD CONSUMPTION AS A PERCENTAGE OF FOOD PRODUCED (GRAINS, VEGETABLES, FRUITS, LEGUMES) IN SURVEYED DISTRICTS					
Grains					
Rice	12%	5%	5%	10%	3%
Corn	46	29	43	14	31
Vegetables					
Potatoes	0	6	22	.53	0
Plantains	10	14	28	7	3
Fruits					
Bananas	23	12	33	.16	.3
Oranges	4	23	15	6	26
Pineapples	8	5	53	12	5
Legumes					
Beans	68	52	34	27	29

F. SANITATION	#	%	#	%	#	%	#	%	#	%
Total Number of Persons Surveyed	63,581	100	48,460	100	57,213	100	63,350	100	28,738	100
With sewer	2,939	4			5,519	9	18,419	29		
With septic tank	32,283	50	12,905	26	16,148	28	18,131	28	7,780	28
With concrete slab latrine	18,426	28	20,654	42	8,146	14	12,048	19	7,804	27
With wooden slab latrine	6,582	10	8,423	17	13,356	23	12,377	19	5,431	18
Other	160	.2	487	1	3,652	6	436	.6	532	1
No sanitary service	3,191	5	5,985	12	10,392	18	1,929	3	7,191	25

G. WATER										
Total Number of Persons Surveyed	63,581	100	48,460	100	57,213	100	63,350	100	28,738	100
With public water system	57,677	90	28,534	58	34,723	61	52,019	82	6,418	22
With private water system	2,079	3.2	4,905	10	2,634	4	4,662	7	9,097	31
With well	614	.9	5,607	11	11,676	20	1,991	3	3,286	11
With public fountain		.27	175	.36	377	.65	248	.39	319	1
Other		6.1	9,239	19	7,803	13	4,431	6	9,618	33

	REGION 1	REGION 2	REGION 3	REGION 4	REGION 5
H. NUTRITIONAL STATUS					
Children 0-5 Surveyed	46.6%	39.1%	31.4%	35.8%	34.7%
Normal	43.2	51.4	62.5	55.5	56.7
Malnourished	38.0	38.5	44.4	42.8	45.1
1st degree	4.3	11.9	16.9	11.5	10.4
2nd degree	.9	1.0	1.2	1.2	1.2
3rd degree	10.2	9.5	6.1	8.7	9.2
Overweight					
I. CHILD MORTALITY 0-5 IN SURVEYED POPULATION					
Deaths Related to Malnutrition and Sanitation	39%	54%	59%	53%	60%
Principal Causes:					
Enteritis and Diarrhea	x	x	x	--	x
Pneumonia	x	x	x	x	x
Infectious Diseases/Parasites	x	x	x	x	x
Chicken Pox			x		x
Anemias	x	x			x
J. MORBIDITY COMMUNICABLE DISEASES REPORTED					
Influenza	4,554	3,184	4,373	1,996	2,750
Malaria	16	51	63	12	19
Dysentery	194	145	790	34	60
Chicken Pox	666	276	712	237	214
Diphtheria	7	12	-	-	6
Whooping Cough	396	126	165	197	175
Tetanus	5	14	30	25	7
K. AVAILABILITY OF NUTRITION AND HEALTH SERVICES					
Hospitals	14	5	3	5	5
Rural Assistance Centers	1	1	5	2	1
Clinics (Ministry of Health and C.C.S.S.)	9	4	6	4	0
Dispensaries	20	47	15	24	11
Nutrition Centers	53	56	56	53	15
Mobile Units	1	2	3	0	4
Health Posts	19	27	37	15	12
	117	142	125	103	48

Narrative Description of the Table of "Comparative Indicators by Programmatic Health Regions"

Income

Region 1 which encompasses the heart of the industrial sector and the capital district understandably has the highest known per capita income. Region 5, an area with one-fourth the population as Region 1, includes the highly-paid banana workers and in addition, reports 47% of the population with an unknown salary (as compared to 23% in Region 1). This can explain what appears to be an unusually progressive community. Regions 2, 3 and 4 each have a small amount of industry and principally agriculture as the source of income. Region 3, an area with several large landholdings, also has a high percentage (37%) of unknown income while Regions 2 and 4 are similar in their earnings and in their unknown income (26 and 27%).

Land Utilization

Since regions for health programs do not coincide with the agricultural regions, the land utilization data shown cover only the 41 districts in the nutritional survey. Also included in "Land Under Cultivation" is pasture land. In Region 3 this represents 87%.

In terms of territory Region 1 is very small. The densely populated capital area is rapidly expanding into unused areas and what land there is for farming is used. Region 2, while very productive has both difficult mountain terrain and large expanses of unexplored territory. 50% cultivation is probably high considering the size and population of the region.

Region 4 includes the eastern half of the extensive and difficult maountain range that divides the country from North to South. Large areas of this region belong to the banana producing zone.

Food Availability

The figures under this section represent the entire region.

Densely populated Region 1 with 1/3 of the nation's people and its relatively small size is the only region to show a negative food balance. This rich mountain region produces a non-nutritious cash crop: coffee.

Both Regions 3 and 5 - the least densely populated - have high intensity production, the former in cattle and rice which yields huge surpluses in protein, iron, Vitamin A and calories, and the latter in bananas and rice which account for the substantial excess of calories.

Region 2 - "the frontierland" - has a growing beef industry and produces a range of crops from tropical to mountainous. The mountain urban areas are an extension of the Meseta Central - the populous region. This contrasts markedly with the northern hinterlands and is reflected in the range of density from 0 to 600 per square Km.

Region 4 - less populated than Region 2 with only 1 major urban center in the mountain valley - has both a wet tropical zone with major cultivations in bananas (note the excess of calories) and difficult mountain areas, many of them inaccessible.

On-the-Farm Food Consumption

The data in this section represent only the 41 districts in the survey.

Farm food consumption is inversely proportional to the general food production of that area. This is normal in that high production areas will "export" to other regions (or countries) and reserve a smaller proportion for home use. Areas of low production can readily consume a large % of their crop. Note banana consumption in Regions 4 and 5 (the banana zones) as compared to 1, 2, and 3; the rice production is high in Regions 2, 3 and 5 with correspondingly low home consumption.

Similar farm consumption patterns are not available for meat, vegetables or dairy products and would be valuable to have. By law beef is to be slaughtered at a community slaughterhouse under the supervision of the health inspector. But swine and poultry are slaughtered on the farm. (Other data show that pork production is very low and eating chicken in the home is considered a luxury. The retail price of these items is high compared to beef).

Sanitation

Of the types of sanitary units described, sewer and septic tanks are the most desirable. When limited running water is available a concrete slab latrine, if properly cleaned, can be an effective means of human waste disposal. A wooden slab latrine is more difficult to clean and therefore

more likely to become a source of infection. "Other" means none of the mentioned systems describes what is being used. A considerable number of family units have no sanitary service and are readily the cause and the victim of continued reinfection by parasites and worm infections due to improper waste disposal.

The table represents only the 41 communities surveyed. By health region we find the following percentages having adequate sanitation: 82% in Region 1; 68% in Region 2; 51% in Region 3; 76% in Region 4; and 55% in Region 5. The Central Region (#1) fares far better than the others in sanitary service. Though an urban underground sewer system extends to half of the capital city population, the more predominant service is the individual septic tank.

In Regions 3 and 5 with a highly dispersed population, sewer systems are financially unfeasible. This dispersal may also inhibit the development of sanitary services because of cost or convenience.

Water

Water systems can be divided into those that are almost always known to have potable water and those in which the water is questionable. Of the former, public water systems are checked by the municipalities or the water department and water is treated chemically to maintain a standard of acceptable hygiene. Well water coming from deep reserves is considered purified through a natural; filtration process. Only if a sewer system is unwittingly placed near a well can contamination be expected.

The other systems are questionable in their purity of water. A private water system built for industrial purposes is likely to use modern methods of assessing and controlling the quality of water. But a private system built on a large farm that serves homesteads and livestock feeding alike may be lacking in this quality control. Public fountains are not described other than to say communal sources of water but do not indicate if it is a spring or a man-made storage unit. "Other" is almost inevitably a contaminated source, such as rivers, canals, collected rainwater or streams.

Based on the above criteria, potable water availability for the communities surveyed and grouped by region is the following: Region 1, 91%; Region 2, 69%; Region 3, 81%; Region 4, 85%; and Region 5, 33%.

There is a strong correlation between areas without water systems (potable or not) and areas that have no sanitary service. Region 1 which has 6% using "other" sources of water has about 5% with no sanitary service. Region 5 with the largest % without water (33%) also has the largest % without indoor plumbing.

Nutritional Status

The determining of malnutrition by degrees according to the Gómez Scale, however faulty it is, is the most widely accepted international measurement that we have. Relating this condition to our other regional indicators can demonstrate certain patterns which are crucial to the country's future planning.

As related to sanitation, the area with the highest % of malnutrition (Region 3) also has the highest per cent of "wooden outhouse, other or no service". Conversely Region 1 has the lowest % of malnutrition and the lowest % of this class of service. Region 5 also shows a high relationship while Regions 2 and 4 do not. (Coincidentally or not, Regions 3 and 5 also have the most dispersed population).

Region 1's high % of public water continues to support the low malnutrition. Region 5 has a very low amount of potable water. Regions 2 and 4 are comparable in their water supply, though 4 has better sanitation and slightly better nutrition. Region 2, does not relate malnutrition with water or sanitation: water supply is low, poor sanitation is prevalent and malnutrition is the second lowest of the 5 areas, but it does show a high proportion of the population in the lower income bracket and the smallest % of cultivated land.

There is an obvious lack of relationship between malnutrition and food availability. Region 1 with the lowest rate of malnourished has the only negative food balance. A nd Region 3 with the highest malnutrition has the most positive food balance. As a primarily agricultural country Costa Rica exports sizeable quantities of its high caloric and protein food, namely beef, sugar and bananas.

Regional export data is not available but national production and consumption are reported for beef and sugar. Of the 224,909 head of cattle slaughtered in 1973 only 54% was destined for internal consumption and 46% was exported. Production of sugar in 1972-73 was 176,208 metric tons of which 54% was exported. In bananas, 42,086,212 arms of bananas were exported.

Regions 4 and 5 are the banana areas and Region 3 is the principal beef producing zone. In addition, Regions 2, 3, 4, and 5 supply the very low-producing and high consuming Region 1. On the other hand, food imports include wheat flour ($11,553,997); beans ($178,777); pork ($1,604,065); vegetable oils ($2,739,645) and evaporated milk ($481,812). The Ministry of Health imports about 800,000 lbs. of powdered milk annually. The CARE PL-480 program, presently in its phase out stage, has been providing 2 or 3 million pounds of CSM over the past few years.

Children who are overweight have or can develop health problems that may interfere with their normal growth patterns. Overweight problems as a result of hormone deficiencies should be distinguished from those which are an imbalance of caloric intake and caloric expenditure.

Child Mortality

Because malnutrition is neither recognized by physicians nor reported as primary cause of death in children, we are looking more closely at deaths related to malnutrition, where the primary cause may be a viral or bacterial infection. A child suffering from a low or poor quality food intake does not have the physical capacity to resist the infections that a well-nourished child regularly fights off. More serious infections such as pneumonia, measles, chicken pox, diarrhea and parasites are causes of concern in a normally healthy child but are much more alarming in a weakened or undeveloped child. While a normal child will recover, a malnourished child will suffer a serious set-back, with possible complications and even death.

In Regions 3 and 5 with the highest % of malnutrition, deaths related to malnutrition, specifically through infection, are highest at 59 and 60%, respectively. Region 1 shows the lowest rate of malnutrition and the lowest rate of deaths related to malnutrition. Regions 2 and 4 are comparable. Note also that enteritis and diarrhea and infectious diseases and parasites are universal causes. Chicken pox is predominant in Regions 3 and 5.

Morbidity

The data on morbidity represents the whole country by region and is a required report on contagious diseases. It shows a prevalence of certain diseases in certain areas, e.g. whooping cough, chicken pox, dysentery and malaria.

Region 3 reports the highest number of cases of chicken pox and also reports infant deaths by chicken pox. Region 1 also reports a significant number but considering the population density this is not surprising.

Malaria eradication programs have been in effect for several years but control at borders is not possible. Region 3 borders the northern neighbor where malaria is still a problem. Dysentery is very high for Region 3 where poor sanitation and malnutrition rates are the highest. Whooping cough is highest in Region 1. This air borne disease spreads by direct contact and parts of this Region have as many as 1,200 residents per square Km. In addition other medical statistics show that less than $\frac{1}{2}$ of the infant population has received the series of 3 DPT shots against this disease. This same series covers tetanus which is highest in Region 3. Less than 25% of the infants have been fully vaccinated against this infection.

Availability of Nutrition and Health Services

Availability of nutrition and health services is in terms of the physical facilities available, not necessarily if or when they are used. Clinics may be "open" every day but will have out-patient care only on two days per week. There is a rigidity in the service which allows only certain parts of the facility to function on certain days. Health posts may be visited by medical personnel once fortnight - or have such limited service as only school and home visits. Likewise, a nutrition center may be as diverse as a serving window for monthly distribution of powdered milk; a dirt floor, unlit kitchen for soup preparation for 15-20 children; or an equipped kitchen that daily serves 80 children a meal.

The facilities are not always in proportion to the population. Region 5 has the best ratio of hospitals at 1 per 35,000. Three of these hospitals are private institutions. Region 3, the other widely dispersed population has one hospital per 92,500 people. But the Rural Assistance Centers with 6-12 beds primarily for delivery are more numerous and help to take the services cut to the more distant urban areas.

Dispensaries, designed to serve the rural population, have good ratios in Regions 2, 3, 4, and 5. As Region 1 is largely urban such facilities would not serve a purpose. Health posts are particularly aimed at serving a dispersed population and Region 3 with the largest number of posts has 1 per 7,500 people. Region 5 with the same density has half of the coverage i.e. 1 per 14,600 but the extra hospitals provide addition of serv-

ices. Region 4 has a ratio of 1 post per 21,100 population. This Region is slightly more densely populated and has a better dispensary ratio than either Region 3 or 5.

The relationship of the "Nutrition Centers" is more ambiguous. As mentioned before, the definition of that Center varies tremendously in facility, service offered, and distribution patterns of food products. (The proportion of "Nutrition Centers" to the population is not related to rate of malnutrition; that is, the area of highest malnutrition (Region 3) has the best ratio of centers to 0-5 population (1-930). The area of second highest malnutrition has the lowest ratio of centers to 0-5 population (1-2,368). Region 1 with the lowest malnutrition had a similarly low ratio (1-1,878). Regions 2 and 4 has an inverse relationship: low malnutrition and less coverage and high malnutritiona and low coverage. Much more information is needed on these centers to understand what they do and how they operate.)

Data that was Discarded from the Above Analysis

In addition to the data contained in the table on Comparative Indicators, the USAID also analyzed other factors which were subsequently discarded due to various reasons i.e.:

1. Hemoglobin on Children and Mothers Taken in the MOH Nutritional Survey

The entire section on hemoglobin in the survey is unreliable. Thus is due to serious methodological mistakes incurred by the people who were responsible for taking the blood samples.

None of the blood samples reached the laboratory before 4 days and some up to 10 days after being taken. The samples were not refrigerated before being analyzed.

2. Infant Feeding Patterns

The size of the sample was too small. In addition, in many cases the interviewer recorded the data as saying "still breast feeding," without recording the number of months that the woman had been breast feeding. This further reduced the size of the sample until it became insignificant.

The same problem of small size of the sample applies to the data on introduction of weaning foods.

3. Daily Food Intake

The MOH survey contained two sections on daily food intake: one for mothers and one for children. The data was recorded indicating variety of foods taken but not quantity. Furthermore, by simple visual analysis and knowledge of Costa Rica the information contained in this section was wholly unrealistic.

AN ANALYSIS OF THE FACTORS AFFECTING MALNUTRITION AT THE DISTRICT LEVEL IN COSTA RICA

In this analysis we compare the nutritional status of the 41 districts as measured by the 1975 Nutrition Survey with available data about those same districts' environmental, economic, and social situation. The purpose is to see what relationship exist, if any, between the incidence of malnutrition in a district and those factors which have generally been thought to affect childhood nutritional status. Before continuing we list those factors which were included in the analysis and give the key to their numbering in later sections.

I. Factors Included in the Analysis

A. Measures of Nutritional Status

The variables listed here (numbers 1 through 7) were calculated from the data collected in the 1975 GOCR Nutrition Survey. A more detailed definition of what each of these variables means is given in the following section.

1. % children 0-5 years with 1°, 2°, or 3° malnutrition. (Gómez Scale).

2. % children 0-5 years with 2° or 3° (severe) malnutrition. (Gómez Scale).

3. % children 0-5 years with deficient hemoglobin levels.

4. % children 0-5 years with low or deficient hemoglobin levels.

5. % children 0-5 years - exhibiting stunting and/or wasting. (Dr. Mata).

6. % pregnant women found with insufficient body weight.

7. % pregnant women found with low or deficient hemoglobin.

B. Availability of Water and Sanitary Services

These factors were chosen because they are generally thought to be key elements in the nutrition equation. The relationship between enteric (digestive) diseases and parasites and nutritional status widely accepted as being one of the key links in the nutritional equation. The availability of potable water and sanitary services are the most important factors determining the level of enteric disorders.

8. % of district population living in dwellings with access to public or private water systems or having a well.

9. % of district population living in dwellings with sewer hookups, septic tanks, or concrete block cesspools.

C. Economic and Social Factors

These variables were chosen to represent some of the economic and social factors which are generally believed to affect nutritional status, through the mechanisms of family income, educational level, access to services, availability of food, infant weaning practices, etc.

10. % of population with less than ₡2,200 annual income.

11. Average size of farms in the district.

12. The amount of land in crops, per capita.

13. Calorie balance ratio (calories produced/calories required).

14. Protein balance ratio (proteins produced/proteins required).

15. Calories produced per hectare.

16. Proteins produced per hectare.

17. % of children weaned on broth or gelatin. (Poor weaning foods).

18. % of infants breast-fed 6 months or less.

19. Total health services score. (The number of health services available in the district times the number of years in the last ten that a given service has been available to a district.)

20. The number of years a district has had a Nutrition Center. (Maximum score of 10).

21. District population from 0-5 years.

22. District population from 5-12 years.

This is by no means an exhaustive list of the number of factors which could be included in the analysis, nor are these variables necessarily the best or only choice to represent the real-world factors we are trying to measure. But for a preliminary analysis, which this paper represents, they are more than sufficient, and, as the following sections indicate, provide us with consistent and surprisingly good analytical results.

II. Comparison of the Measures of Nutritional Status

The first analysis we undertook was a simple comparison of the seven different measures of nutritional status we calculated from the Survey Data. The purpose was simply to see if the different measures are comparable and correlated in any way. This was especially interesting for the hemoglobin variable, as there are some very strong doubts as to the validity of the manner in which this was measured during the survey.

Before beginning a comparison of the different measures, a brief description of each is in order.

A. The Gómez Scale

Developed by Dr. Gómez while working with hospitalized malnourished children in Mexico during the 1940s, this scale relates a child's body weight to their age. Children are classified as being either overweight, normal, first, second, or third degree malnourished. Over Dr. Gómez' protests, this scale has become the most widely used international system for measuring childhood malnutrition in large populations. Its main limitation is that it does not accurately classify children who are small and light for genetic reasons, or whose growth was retarded because of earlier nutritional problems but are now healthy and well-nourished though permanently small.

B. Blood Hemoglobin

This is a more accurate measure of current nutritional status, if it is taken well and the blood samples are carefully handled and analyzed. Available information in the present case indicates that such care was not used, and we have reason to believe the hemoglobin data may be worthless. The measurements used are normal hemoglobin levels, low levels, and deficient levels; in increasing order of severity.

C. Stunting and Wasting

This measure of nutritional status was applied to the survey data by Dr. Leonardo Mata. It takes the same measurements of age and weight used in calculating the Gómez Scale, and adds height. Children are defined as being Stunted if their measured height is less than 90% of the expected height for their age group, based upon the Iowa Standards. Similarly, they are defined as being Wasted if their measured body weight is less than 80% of the expected weight for their height, again based upon the Iowa Standards. In summary:

Stunting = less than 90% height-for-age.
Wasting = less than 80% weight-for-height.

Two measures of the nutritional status of pregnant women were also included, based upon criteria similar to those above.

D. Body Weight of Pregnant Women

Similar to the Gómez measurements or the Wasting measure, this measurement indicates whether the body weight of a pregnant woman indicates acceptable nutritional status.

E. Blood Hemoglobin of Pregnant Women

The same measurement, and probable difficulty, as described in II. B above.

The following table contains the correlation ratio between the seven different measures of nutritional status.

Table 1

CORRELATION RATIOS BETWEEN MEASURES OF NUTRITIONAL STATUS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) 1·, 2·, and 3· Malnourished (Gómez)	1.00						
(2) 2· and 3· Malnourished (Severe) (Gómez)	0.87★	1.00					
(3) Deficient Hemoglobin (children)	0.30'	0.06	1.00				
(4) Low or Deficient Hemoglobin (children)	0.31'	0.06	0.94★	1.00			
(5) Stunting and/or Wasting	0.76★	0.68★	0.09	0.17	1.00		
(6) Pregnant Women with Low Body Weight	-0.13	-0.02	0.12	0.14	-0.04	1.00	
(7) Pregnant Women with Low or Deficient Hemoglobin	0.18	-0.06	0.51★	0.47★	-0.04	-0.15	1.00

NOTE: ★ Indicates significance at 0.01 level.
' Indicates significance at 0.05 level.

The correlations in Table 1 tell us that:

1. The results of the blood hemoglobin tests have low and/or insignificant correlation with the other measures, indicating that our suspicions of their inaccuracy may be correct.

2. The measures of malnutrition for pregnant mothers show low and insignificant correlation with the measures of malnutrition for children. This can mean:

a. the highest incidences of malnutrition in children are to be found in different communities than the highest incidences of malnutrition in pregnant mothers, which indicates that different environmental factors determine the nutritional status of either group, or

b. the measures used for defining nutritional status in pregnant women are not accurate, or

c. the sample of pregnant women was so small that the correlation coefficients could not be accurately computed.

The last two possibilities are probably truer than the first.

The results of Table 1 imply that a necessary element in the whole nutrition program is research to find accurate indicators of nutritional status and training for the survey samplers who will have to take the measurements. Without such research and training it will be impossible to accurately monitor the progress of the program and evaluate its impact.

III. Correlations Between Nutritional Status and Other Factors

Table 2 contains the correlation ratios between all the variables in the analysis, including both the nutritional status indicators and the assumed explanatory factors.

Looking down columns 1, 2, and 5 which are the anthropommetric measures of nutritional status, we can see that the highest correlation is

with (9), Availability of Sanitation Services. The negative sign of this correlation tells us that the communities which have higher percentages of these servic s tend to have lower incidences of malnutrition. Although no causal effect can be taken from this information, it does confirm our general conceptions of the nutritional situation and its determinants. The other factors which have consistently higher and significant correlations with nutritional status are:

(8) Availability of improved water systems.
(14) Protein food balance. (Negatively correlated with good nutrition).
(10) Income distribution.
(11) Farm Size
(12) Cropland per capita.

What this table tells us is that:

1. The data is consistent with the generally-accepted concepts of nutritional status and environmental factors, and that

2. The available data in Costa Rica should permit us to study the nutritional situation and plan program interventions with a reasonable degree of accuracy.

The fact that two variables are well-correlated says nothing about there being a cause-and-effect relationship between the two factors. A more powerful analytical tool for measuring the relationship of several variables simultaneously is multiple regression analysis. In the first computer run we ran such a regression in which the nutritional status of the 41 communities as measured by the Gómez Scale and Dr. Mata's Stunting/Wasting Measurement was compared with the following factors:

(9) Availability of sanitary facilities.
(8) Availability of improved water supply.
(19) Availability and duration of health services.
(10) Income.
(11) Land distribution.
(13) Food Balance: Calories.
(14) Food Balance: Proteins.

The results of the regressions showed the following three variables to be consistently best in explaining the variation in the level of measured malnutrition in the 41 Districts.

(10) Income.
(9) Availability of sanitary facilities.
(19) Availability and duration of health services.

The statistical confidence level for these three variables was in all cases very high; at least 95%. Again, this is not any proof of cause and effect, but it does tell us that malnutrition and these factors are consistently related among the 41 communities in the sample and probably would be related throughout the country.

These results, though highly preliminary, are encouraging, in that they demonstrate some basic consistencies in the data, and indicate that refinements in the analysis and further tests should give us a good return in added understanding of the nutritional situation.

Conclusions

The analysis and data both consistently point to sanitary services and the availability of health services as the most important environmental factors explaining the differences in nutritional status between the 41 districts. The confidence levels are high enough already to permit a fairly honest conclusion that this relationship will probably be found in the rest of the nation's 360-odd districts. Hopefully, with further analysis, we will be able to pinpoint more accurately the causal factors of malnutrition on a district-by-district basis.

Table 2

CORRELATION RATIOS FOR ALL VARIABLES

	1	2	3	5	7	21	8	9	20	19	17	18	10	11	12	13	14	15	16
(1) 1·, 2·, and 3· Malnutrition	1.00																		
(2) 2·, and 3· Malnutrition	.87"	1.00																	
(3) Children Deficient Hemoglobin	.30'	.06	1.00																
(5) Stunting/Wasting	.76"	.68"	.09	1.00															
(7) Pregnant ♀ with Low Hemoglobin	.18	-.06	.52"	-.04	1.00														
(21) Population 0-5	-.14	-.02	.16	-.18	.15	1.00													
(8) Good Water	-.54"	-.50"	-.13	-.58"	-.03	.13	1.00												
(9) Good Sanitation	-.74"	-.65"	-.31'	-.64"	-.26'	.20	.76"	1.00											
(20) Nutrition Center	-.42"	-.37"	.02	-.43'	.20	.44"	.35'	.46"	1.00										
(19) Health Services	-.39"	-.31'	.11	-.44'	.22	.71"	.33'	.40"	.79"	1.00									
(17) Poor Weaning Foods	.38"	.32'	.34'	.10	.23	.36'	-.10	-.29'	.03	.28'	1.00								
(18) Early Weaning	-.38"	-.33'	-.26'	-.34	.12	.09	.15	.35'	.16	.06	-.12	1.00							
(10) Low Income	.45"	.44"	.41"	.25	.19	.33'	.01	.22	.12	.25	.53"	-.18	1.00						
(11) Farm Size	.41"	.31'	.22	.26	.25	-.10	-.46"	-.58"	-.10	-.04	.50"	-.21	.23	1.00					
(12) Crop Land Per Capita	.50"	.35'	.40"	.28'	.17	-.04	-.64"	-.55"	-.25	-.07	.31'	-.14	.22	.59"	1.00				
(13) Calorie Balance	.31'	.21	.42"	.11	.12	.08	-.34'	-.25	-.17	-.08	.36"	-.06	.33'	.39'	.73"	1.00			
(14) Protein Balance	.55"	.41"	.34'	.32'	.27'	-.32'	-.49"	-.67"	-.31'	-.31'	.32'	-.41"	.19	.69'	.44"	.46"	1.00		
(15) Calories/Hectare	-.02	-.04	.28'	-.22	.09	.61"	-.03	.10	.10	.50"	.38"	.05	.36'	.05	.40"	.66"	-.01	1.00	
(16) Proteins/Hectare	-.25	.28'	.15	-.01	-.01	.48"	-.27'	-.16	-.02	.25	.24	.08	.42"	.07	.38"	.44"	.17	.68"	1.00

' = Significant to the 5% level of significance.
" = Significant to the 1%.

PREVALENCE OF MALNUTRITION IN A COMMUNITY

According to: potable water, non-potable water, poor or no sanitary facilities

GROUP I. Less than 50% malnutrition in all age groups

	Potable water	Non-potable water	Poor/no sanitary facilities
Curridabat	99.0%	1.0%	8.0%
Cartago Centro	99.7	.3	3.1
Aserrí *	88.2	10.8	17.0
Palmares	99.0	1.0	5.6
San Juan	99.0	1.0	1.3
Turrialba	83.7	15.4	22.2
Santa Bárbara	99.0	1.0	7.0
Sánchez *	57.3	42.7	2.7

Group characteristics:
Urban communities: 75%
*Rural characteristics: 25%

School attendance: 89%
(Rural: 82.5%
Urban: 91.0%)

Infant mortality related to nutrition: 39.5%

GROUP II. All or some of the age groups with more than 50% malnutrition

	Potable water	Non-potable water	Poor/no sanitary facilities
Pejibaye *	18.0%	82.0%	78.0%
San Pablo *	78.8	20.2	25.0
Palmar *	30.0	70.0	28.0
Puerto Cortés	60.5	39.5	39.0
Siquirres	64.4	35.6	39.0
Guápiles *	89.8	10.2	34.0
Chomes *	59.8	40.2	83.0
Santa Elena *	73.8	26.2	85.0
La Sierra *	33.5	66.3	89.0
Las Juntas	68.0	32.0	48.0
27 de Abril *	56.9	43.1	80.0
Jacó *	41.6	58.4	74.0
Puerto Viejo *	43.1	56.9	74.0
Zapotal *	8.9	91.1	71.0
Piedades Norte *	67.5	22.5	15.2
Cutris *	44.7	55.3	73.7
Desmonte *	38.0	62.0	57.0
San Pedro *	54.6	44.7	49.0
San Nicolás *	93.8	5.9	16.0
Puntarenas	97.1	2.9	26.0
Santa Cruz	87.0	13.0	43.0
San José de la Montaña *	68.3	31.7	11.0
Santa Lucía *	98.1	1.9	6.0
Santo Domingo *	76.0	24.0	9.0
Santiago *	49.0	49.6	17.0
San Mateo	81.0	19.0	23.3
Concepción *	98.0	2.0	30.0
Cinco Esquinas	98.8	1.2	10.0
Vuelta de Jorco *	71.0	28.6	60.0
Cot *	89.1	10.9	21.0
Ciudad Quesada	81.8	18.2	14.6
Naranjito *	25.0	74.0	74.0
Peralta *	37.3	61.6	57.0

Group characteristics:
Urban communities: 25%
* Rural communities: 75%

School attendance: 81%
(Urban: 86%
Rural: 80%)

Infant mortality related to nutrition: 53.6%

Narrative Description of Table on "Prevalence of Malnutrition in a Community"

The 41 communities covered in the MOH 1975 nutritional survey report malnutrition by age from 0-5 years. Nutritional status as an indicator of general health is determined by the complex interrelationship of food habits, environmental conditions and general education of the community. Environmental conditions (specifically potable vs. non-potable water, and poor or no sanitary facilities) are readily quantified and are used in the following table as the variable for showing prevalence of malnutrition in a community. Food habits are developed on the basis of availability and understanding of how to use what exists. Rural communities with limited transport and communication systems and poor food storage facilities have less variety of food available and, during the off-season, have less quantity as well.

In Group I all of the age groups in the survey showed less than 50% malnutrition. In addition, 75% of the communities are classified as urban (exceptions are Sánchez and Aserrí) and the average school attendance is 89%. (In the urban areas it is 91% and in the rural it is 82.5%). Note also that the percentage of infant mortality related to nutrition or "sanitary" diseases is 39.5%.

In Group II, all or some of the age groups have more than 50% occurrence of malnutrition. Of this group, 75% are rural communities and the average school attendance is 81%. (In the urban areas it is 86% and in the rural areas it is 80%). Infant mortality due to nutrition or related diseases is 53.6%.

Consequently, rural communities with poorer water and sanitation facilities, a lower educational standard (as reflected by school attendance), and poor food habits show higher rates of malnutrition in all age groups.

Effect of Inflation on Cost of Food of Lower Income Groups

Between December 1969 and December 1974 the consumer price index increased by 72% (Table 1). The heaviest increase was in the food component (78%) which is given a weight of 43.3% in the index.

This increase, however, understates the additional burden of the higher cost of food on the family budget of lower income recipients and agricultural workers in particular, who have to spend a much higher proportion of their income on food. A survey made in 1974 showed that the percentage of income spent on food ranged from 64% for banana workers to 91% for workers in the coffee fields. Since the minimum wage increased by only some 25% between 1970 and April 1974 and is the applicable wage for most of these low-income workers their economic situation appears, therefore to have substantially worsened.

Preliminary data for the first eight (8) months of 1975 indicate that the cost of food has increased further (Table 2). Thus despite an increase in minimum wages of some 29% which was put into effect in April 1974, the economic position of the lowest income group in particular has suffered a substantial erosion between 1970 and 1975.

Table 1
Consumer Price Index
(1964 = 100)

	Weights	December 1969	December 1974	% Increase
Total Index	100.0	110.5	190.0	72
Food	43.3	115.4	205.3	78
Housing	23.4	107.0	178.7	67
Clothing	13.6	101.8	154.9	52
Other	19.7	109.3	193.8	77

Source: Central Bank of Costa Rica.

Table 2

Price Index for Middle and Low-Level Income Recipients

Metropolitan Area of San José

(1964 = 100)

	General	Food
1970	112.61	118.67
1974	181.96	195.82
1975★	207.64	221.63

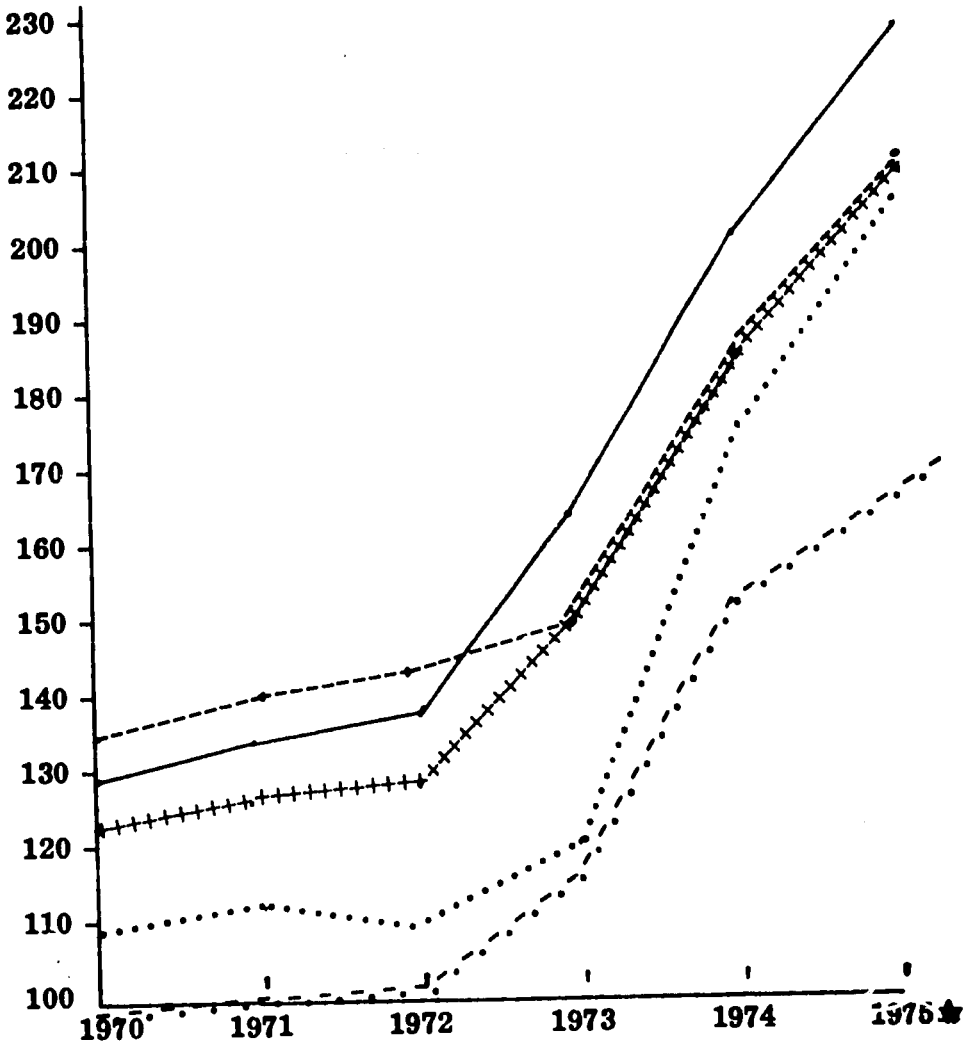
Agricultural Workers

(1956-57 = 100)

	Central Valley		Limón		Golfito		Quepos	
	General	Food	General	Food	General	Food	General	Food
1970	133.20	140.74	132.04	144.74	120.39	122.99	114.65	120.41
1974	223.15	239.78	202.71	213.87	172.69	192.17	161.38	174.06
1975★	266.09	289.50	217.40	222.27	189.10	211.95	175.53	189.45

★ January to August

PRICE INDEX CURVES
NATIONAL AVERAGE



++++++++++ General

_____ Food

. . . . . Housing

-.-.-.-.-. Clothing

---------- Others

★ January through August.

ASIGNACIONES FAMILIARES AND THE REDISTRIBUTION OF INCOME

The GOCR formally characterizes the Asignaciones program as a means of redistributing income. Here, we briefly examine that proposition.

First, it should be noted that this redistribution of income to the poorest sectors of society may only be counteracting the opposite redistributive effect of inflation over the past two years. Inflation has often been seen as a form of tax which redistributes income among the different economic classes of a society. Where and how the redistribution takes place depends on the type of inflation and the type of action governments take to deal with it. If wages rise with the cost of living, and food prices are allowed to rise, while rents and other prices are placed under controls, the distribution can be toward the wage-earning and food-growing classes and away from the assets-holding classes.

In Costa Rica this has not been the case. As noted in Annex G, between 12/69 and 12/74 the general price index for the San José Metropolitan Area rose from 110.5 (1964=100) to 190.0, an increase of 72%, while food prices (which accounted for 43.3% of household expenditures) rose from 105.4 to 205.3, or 78%. During the same period the minimum wage rose by only 25%. The general wage level rose by a little more, but not nearly enough to keep up with the inflation. In the rural areas, small farmers who market their production may have at least broken even, as the price they receive for their commodities has risen along with everything else. But the substantial number of agricultural wage workers, who spend well over half their income on food, have seen their real income shrink.

The redistribution of income has been away from these poorest classes towards the commercial classes, the rent-earning classes, importers, overseas suppliers, and land-holding classes.

Asignaciones Familiares taxes away some of the income to these classes and redirects it to the lowest income classes by supplying food, and health and sanitation services. To the extent that the food is grown nationally (see Chapter VII on Food Supply) the redistributed income will have positive multiplier effects throughout the economy. This is especially

beneficial since much of the taxed earnings would have gone for luxury imports.

Insofar as the beneficiaries of this program will be able to shift family income away from food purchases, the tax and redistribution should still have a positive effect on the economy, for their consumption patterns undoubtedly have a higher nationally-produced component than the classes from whom the income was originally taxed.

Coupled with the increase in the effective demand for food discussed in Chapter VII, the tax and redistribution effects of this program are almost textbook examples of enlightened government policy for a developing country.