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AN OVERVIEW OF THE NUTRITION SYSTEM OF THE PHILIPPINES

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I. SUMMARY

A study team of specialists from the American Technical Assistance Corporation visited the Republic of the Philippines in June and July 1973 to gather data for preparation of an intersectoral nutritional analysis. ATAC was asked to evaluate in particular alternatives to PL480 Title II programs since resources for that program are expected to decline sharply over the next few years. The ability and willingness of the Government of the Philippines to assume an increasing amount of the burden for supplying and administering nutrition programs was also the subject of assessment.

ATAC was asked to suggest some areas for consideration by AID/W and USAID/P to further mitigate the malnutrition problem.

The Philippines is a food deficit country, with production of staples not reaching effective internal demand and falling well short of recommended intake. Rice, the main staple, has been imported every year but one over the last thirty. Wheat, of increasing importance to urban residents is not grown in the country. Self sufficiency of food grade corn, which is the main staple for about 15-20% of the population, has been achieved.

Most specialists agree that about 35-40% of the infants, young children, and primary school children are severely to moderately malnourished. Up to 90% of school children are underweight for age. Diets of vulnerable groups are deficient in calories, high quality proteins, calcium, Vitamin A, Riboflavin and Vitamin C. With the exception of very young infants, deficiencies in calories exceed protein deficiencies among all vulnerable groups.

Income, food habits, family size and spacing of children play important roles in the nutritional status of the population. Income distribution data suggest that approximately 50% of Philippine families cannot afford to purchase adequate diets. Real income gains for low

income groups have been slight over the past decade. Radical income distribution schemes undertaken at this time would place inordinate pressure on food supply.

Marketing of food is generally efficient, without excessive mark-ups. One area of savings that appears to hold promise is increasing and improving storage both to reduce waste and to create buffer stocks.

Processed food consumption is very low in the Philippines except for milled grains, beverages, and sugar. However, the distribution of these foods is nation-wide, even to the most remote store. About 50% of the rough rice supply is milled in small, inefficient mills. Waste in these and other mills is believed to be about 20%.

Programs to meet nutrition problems have focused on the redistribution of food through Targeted Maternal Child Health (TMCH) and School Nutrition programs. The study reviewed previous evaluation of the TMCH program, interviewed program managers, and observed a few distribution centers. The team was impressed with the effort that has been made to target the food to malnourished children. In spite of reduced PL480 Title II resources, the program is rehabilitating an impressive number of infants and children. The team did not review the School Nutrition Program.

The Government of the Philippines has not been deeply committed to attacking the malnutrition problem. Events of the past two years suggest that some officials are persuaded that improved nutrition should be a goal of development. However, the largest program, TMCH, is dominated by the Catholic Church with the government providing limited funds. The School Nutrition Program has a larger government contribution. In the last two years the authority for national nutrition

planning has been given to the National Food and Agricultural Council, a powerful administrative body. Funds have been allocated for research and experimentation in unexploited local food resources. Higher government priority programs on food production and family planning will also have a nutrition impact.

A number of next steps are suggested at the close of the report that will support USAID's and the government's interest in using local foods to meet nutritional needs. In addition, the study team listed other activities that might be considered to strengthen nutrition programs in the Philippines.

Six areas for future study are outlined:

- Improved efficiency of rice milling
- Reduction of infectious diseases in vulnerable groups
- Development of a weaning food based on local products
- Extender of flour
- Nutritional impact on the vulnerable groups of backyard and community gardening.
- Vitamin enrichment of staple foods or commonly consumed condements or beverages

In addition, we recommend that technical assistance be provided in nutrition planning and evaluation of nutrition programs. A division within the National Food and Agricultural Council would be the principal target of the assistance.

CONTENTS

II. NUTRITIONAL STATUS

A. SUMMARY

Malnutrition seriously affects broad sectors of the Philippine society; however, its impact is most clearly seen among infants and children of low-income urban and rural families. Deficiencies of several essential nutrients are evident, but inadequate intake of calories and proteins, manifested in low height-weight/age for nearly 90% of the Philippine infant and child population, are of principal concern. About 40% of this age group are considered severely or moderately malnourished. Improving calorie/protein intakes among infants, children under 6 years, and pregnant and lactating women has been declared a priority of the Philippine government.

B. NATURE OF DEFICIENCIES

1. Proteins and Calories

From the nutrition surveys conducted in the Philippines from 1959-1969, food intake data shows that on average for all age groups and sexes among the middle and lower income groups there are greater deficiencies of calories than proteins, and more families are affected by calorie deficiencies than by protein deficiencies. Age specific food intake data are limited and income group specific food intake data are not available. Until this information is more substantial we will assume that infants and children from low-income families -- those most afflicted by severe and moderate malnutrition -- experience deficiency patterns similar to the general population. The table below summarizes findings of the nutrition surveys.

Table 1

Protein/Caloric Deficiencies

Region	Average % of Dietary Adequacy		Distribution of Inadequacy % of Households With Less Than 70% Dietary Adequacy	
	Calories	Proteins	Calories	Proteins
Manila & Suburbs			30%	20%
Manila	98.8	92.4		
Quezon City	83.3	95.6		
Pasay	84.7	97.4		
Rizal	70.6	88.1		
Southern Tagalog	79.0	81.0	N/A	30%
Cagayan Valley Batanes Region	80.9	86.6	23%	18%
Southwestern Mindanao	74.0	86.0	40%	12%
Ilocas - Mt. Province	87.5	96.9	18%	14%
Western Visayas	75.0	88.0	37%	19%
Eastern Visayas	68.0	80.0	46%	24%

Source: National Science Development Board, Food and Nutrition Research Center, Nutrition Survey, Manila: 1962-1969, Various Volumes

One study that examined intake adequacy found that calories were first limiting for all risk groups. This information is presented on the following page.

Table 2

Average Daily Per Capita Intake of Calories and Protein of Various Groups of the Population

Group		Calories		Protein	
		Intake	Percent of RDA	Intake	Percent of RDA
Children	1- 3 yrs.	829	64	27.3	105
	4- 6 yrs.	1,103	69	30.0	94
	7- 9 yrs.	1,301	68	39.0	93
	10-12 yrs.	1,439	63	42.2	94
Boys	13-15 yrs.	1,547	55	49.0	80
	15-20 yrs.	1,695	61	49.6	76
Girls	13-15 yrs.	1,547	67	35.0	58
	15-20 yrs.	1,352	64	45.2	75
Man		1,742	73	53.3	85
Woman		1,602	89	44.7	81
Pregnancy		1,464	64	43.7	67
Lactation		1,339	46	41.7	56

Source: Carmen Ll. Intengan, "What is the Protein Gap?" Philippine Journal of Nutrition, January-March 1972.

2. Other Deficiencies

The national nutrition surveys disclosed additional deficiencies in food intake, some of which reflected in clinical symptoms and biochemical tests. In all the regions, serum Vitamin A was in the deficient range for 60-95% of the respondents, and of the surveys that reported detailed clinical findings, all but one stated that between 5-12% of the respondents showed clinical signs of Vitamin A deficiency.

Riboflavin deficiencies follow a similar pattern though not as severe as Vitamin A. Vitamin C inadequacies are indicated in bio-chemical tests and national aggregates show inadequate consumption of Vitamin C-rich foods, but clinical signs were not noted. Food intake, biochemical and clinical data indicated moderate to severe deficiencies in riboflavin intake. Food intake data supported the belief that calcium consumption is low, but deficiencies did not appear in clinical and bio-chemical tests*

Because of the paucity of age and income specific nutritional status data, additional food consumption surveys seem warrented. However, given scarce nutritional resources in the Philippines, careful consideration should be given to the subjects of nutrition surveys; breast feeding, weaning practices and consumption levels of infants and children deserve particular attention.

C. OTHER INDICATORS OF NUTRITIONAL STATUS

Infant Mortality Rates in the Philippines are among the highest in Asia (Table 3), even though rates have declined markedly in the last 40 years. Some of the decline may be attributed to improved environmental sanitation, malaria eradication, and immunization campaigns. Since no data exists on national nutritional status before 1960, we are not able to state the extent to which improved nutrition may have contributed to lower infant mortality rates.

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* All these surveys followed the protocol established for the ICNND surveys. See: Interdepartmental Committee on Nutrition for National Defense, Manual for Nutrition Surveys, National Institutes of Health, 1963

Table 3

Infant Mortality Rates
(Deaths/1,000 Live Births)

Japan	18.7
Australia	19.1
U.S.A.	25.2
Hong Kong	26.4
Taiwan	26.4
Ceylong	52.8
Malaysia	53.0
Korea	58.2
Philippines	72.8
India	81.0

Source: Catholic Relief Services-USCC, "An Evaluation of the Nutrition Education Program," (Incentive Grant AID/CED-2462), March 1972.

General clinical judgements about nutritional status (Table4) also indicate the severity and extent of malnutrition.

Table 4

Percentage of Population Rated by the Examining Physician

		Good	Fair	Poor
I.	Manila & Suburbs	27.3	63.9	8.7
II.	Southern Tagalog	9.09	82.19	8.7
III.	Cagayan Valley-Batanes	69.1	26.5	4.3
IV.	Southwestern Mindanao	10.0	84.3	5.5
	0-11 months	35.0	52.0	13.0
	1-6 years	2.2	85.0	13.0
V.	Ilocas-Mountain Region	26.2	67.9	5.9
	0-11 months	49.0	51.0	0.0
	1-6 years	23.0	63.0	14.0
VI.	Western Visayas	4.0	83.3	12.5
VII.	Eastern Visayas	9.5	79.0	11.4
	0-11 months	20.0	61.0	17.0
	1-6 years	6.0	73.0	21.0

Source: National Science Development Board, Food and Nutrition Research Center, Nutrition Survey, Manila: 1962-1969, Various Volumes.

D. MAGNITUDE OF MALNUTRITION

Several methods are available for estimating the number of children and infants who are malnourished. Table 4 above describes examining physicians' reactions to the physical appearance of the population studied in the national nutrition surveys. The survey population are a cross section of the general population and did not concentrate on low-income or age groups thought to be at high risk. About 10-12% of those examined were judged "poor" and about 70% were "fair."

Other studies, focusing on the target group have used weight-for-age as the measure. Based on the Stuart scale modified for the Philippines,* a study in one province of 7,815 children showed 16% below 70% of standard and another 28% in the 70-79% of standard range. A later survey in the province of Bulacan showed 41% of the children at 60-75% of standard. AID uses 35% of the infant and pre-school population as the target of serious and moderate malnutrition. In 1973, this represents about 2.6 million infants and children.

The magnitude of malnutrition among pregnant and lactating women has not been calculated. For purposes of planning, the Targeted Maternal Child Health program estimated that for every three children there will be one pregnant or lactating woman. To our knowledge, no study has been made of the percentage of these women who are malnourished. However, from national survey data, it is apparent that pregnant and lactating women and young mothers still experiencing skeletal growth are, on an average, among the most caloric and protein deficient of all groups in the country.

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* Stuart scale terminology:

Adequate nutrition	> 90% standard
Mild malnutrition	76-90% standard
Moderate malnutrition	61-75% standard
Serious malnutrition	< 60% standard

These figures below are rough estimates and the proportions probably vary widely by region and season of year. However, they give a rough order of magnitude of the problem that nutrition planners face. Before discussing current nutrition programs in the Philippines and their potential for affecting this problem, some of the significant relationships in the food system will be presented. An analysis of some of these relationships will offer insights into causes of malnutrition and perhaps suggest some opportunities for intervening to affect nutritional status.

Table 5

Malnourished Infant, Preschool and School Children*

	1973	1974	1975	1976	1977
Population	40,300	41,500	42,600	43,800	45,000
6-12 mos. (Preventive)	449	462	475	488	501
12-24 mos. (Curative)	488	503	516	530	545
25-30 mos. (Curative)	250	257	264	272	279
Sub-Total (Curative)	738	760	780	802	824
30-36 mos. (Curative)	250	257	264	272	279
36-48 mos. (Curative)	477	491	504	518	532
48-60 mos. (Curative)	453	466	479	492	506
Sub-Total (Curative)	1,180	1,214	1,247	1,282	1,317
TOTAL JURATIVE	1,918	1,974	2,027	2,084	2,141
TOTAL PRESCHOOL	2,367	2,436	2,502	2,572	2,642
SCHOOL (6-14 years)	2,796	2,869	2,945	3,028	3,111

* 6-12 mos. 75% of age group (implies 100% of age group in barrios with TMCH Centers)
12-60 mos. 35% of age group
6-14 yrs. 30% of age group

Population based on slow fertility decline assumption of IBRD Population Sector Review.

Note: This table is based on projection of the percentage composition of age groups in the 1970 census. It does not take account of the impact of great numbers of new child bearers who will come of age in the 70's, tending to increase these numbers.

III. RELATIONSHIPS IN THE CONSUMER SUB-SYSTEM

A. INCOME

Many families are malnourished because they cannot afford to purchase adequate diets, because they do not have enough land or other resources to grow sufficient food or because they sell the more nourishing products for cash income. The magnitude of the population affected by income limitation is illustrated in the following table.

Table 6

Family Income and Foods Costs for Minimum Adequate Diet

Decile	Average Annual Family Income*	% Income Spent on Food**	Annual Adequate Diet Cost***	Difference****
1st	466	80%	P1860	1,488
2nd	909	75%	"	1,198
3rd	1,318	75%	"	876
4th	1,728	75%	"	564
5th	2,191	62%	"	502
6th	2,748	62%	"	157
7th	3,416	45%	"	0
8th	4,432	45%	"	0
9th	6,307	32%	"	0
10th	13,850	32%	"	0

* Source: Office of the Director, Bureau of the Census and Statistics Special Release No. 139-L, February 1973, "Family Income Distribution 1971, 1965, and 1961."

** Estimates based on Family Income and Expenditure Survey, 1965, Survey Division, Bureau of Census and Statistics.

*** The diet used was taken from a previous USAID/P study. The author up-dated cost information. Between the previous study 1970 and this one, the low-income consumer has gained almost no real buying power.

**** The deficit between income available for food expenditures and costs of an adequate diet based on local food habits can be reduced somewhat for lower income groups by purchasing corn instead of rice; increasing purchases of beans, replacing some of the dried fish, and growing food in backyard gardens.

The preceding table was based on retail market prices in Manila for May 1973, using a diet reflecting typical food habits of low-income families in the Central Luzon area. The reference family was composed of six individuals: one infant (9 kg.), one child 1-3 years, 1 child 7-9 years, one male adolescent 16-20 years, one male adult active, one woman lactating. While this may not be representative of all families in the country, it illustrates the large number of young dependents that wage earners must support.

From the table it is obvious that families in the lowest deciles must adjust intakes to conform with income. Equal amounts of calories can be obtained for lower prices by switching from rice to corn to camote (sweet potatoes) or other roots. However, if roots and tubers substitute for grains, protein intake may be reduced. Additionally, low income families will reduce intake of fish, though it is unlikely to be eliminated because of its strong position in the diet. In spite of adjustments the lowest income families cannot afford to purchase adequate calories, proteins and other nutrients given the constraints of bulk, food habits and seasonal availability of food.

Families in the 5th and 6th deciles can probably adjust their food habits to allow adequate diets. These are the families on whom nutrition education could have the greatest impact. For families below these levels, income must be supplemented through food distribution, home or community gardens or food prices lowered before adequacy can be achieved.

B. INCOME GROWTH

Growth of income relative to prices is the way that most developed countries have solved the bulk of their nutrition problems. The great majority of the public achieved an income level that permitted them to buy a wide variety of foods within which were adequate nutrients. Waiting for real income to increase for all population groups and for more equitable distribution of income to occur is one type of nutrition strategy. A major problem is that we may have to wait for decades. Even if this indirect approach is not taken, the relationship of income to prices, especially of food prices, and to income distribution are important in understanding the limitation of nutrition strategies that rely on the free market to bring the effective demand curve up to the level of nutritional needs.

Available information in the Philippines is inconclusive whether incomes have grown in the last decade relative to prices. The following table illustrates the relationship. Income appears to have grown during the period 1961-1965 at a much slower pace than during the latter half of the decade; this is particularly true of the lowest income group. Generally however, lower income groups were less successful than the middle income groups in keeping pace with prices. More recent data, not available at this time, would probably indicate a high income growth during the first six months of 1973, and then with the rapid increase in rice prices in July and August wages would fall behind. On the whole real income has grown in the last 10 years probably about 2% per annum.

During the same period income became slightly more equitably distributed. The middle class gained at the expense of the lower and upper groups. As the economy industrializes this trend can be expected to accelerate. The following figure illustrates changes in family income distribution.

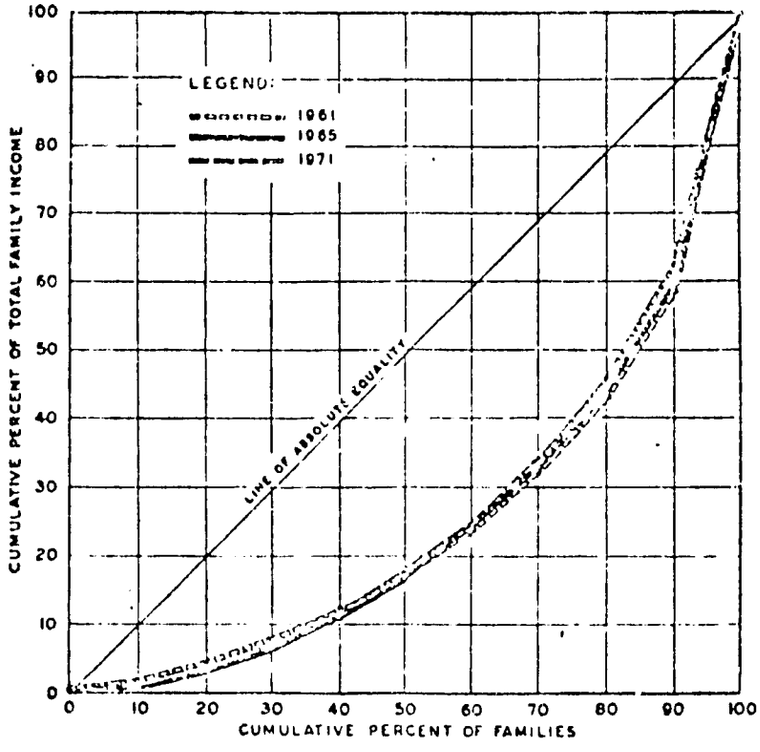
Table 7

Real Personal Income Growth

	Consumer Price Index				Index of Personal Income					
						Lowest Percentiles				
	All items		Food		Total	1st	2nd	3rd	4th	5th
1961	100		100		100	100	100	100	100	100
1965					140	108	123	143	142	146
1966		100		100						
1970	162-173		156-187							
1971		143-170		148-185	207	171	186	215	212	220
1972		177-195		186-194						

Source: Bureau of Census and Statistics, BCS Monthly Bulletin of Statistics, October 1972; Office of Director, Bureau of Census and Statistics, "Special Release" No. 139-C "Family Income Distribution 1971, 1965, 1961"

FIGURE I - DISTRIBUTION OF FAMILY INCOME:
1971, 1965 AND 1961



Source: "Family Income Distribution 1971, 1965, 1961" cited above.

Income is not growing rapidly in relation to prices; and growth is uneven among income groups. Income distribution during the last decade was practically static. It remains to be seen if President Marcos' programs will be more successful than his predecessor's in achieving income distribution. In a later section of this report we will examine a government effort, assisted by USAID to raise rural incomes and the effects that it may have on nutritional intake.

C. INCOME EFFECT OF SUPPLEMENTAL FEEDING

Many specialists in donated food programs contend that supplemental feeding has a more powerful effect on income than on nutrition. This hypothesis deserves exploration in the Philippines since few of those we interviewed would deny that the whole family ate the foods intended for a specific infant.

Current PL480 monthly rations provide about 450 calories and 22.3 grams protein daily. Based on the cost of calories and proteins of the diet used in the preceding diet/income analysis, the ration, if received every month, has an important impact on family income. According to that diet, calories cost P.00044/calorie and P.0132/gram protein. At that cost the ration makes an annual contribution of about P 115, 31% of the food budget of the lowest income families.

The ration's impact could also be calculated by adding its retail value to family income. At current (May 1973) retail prices in Manila supermarkets, the ration is valued at about $3.20/month or P 265/year. However, it is very unlikely that the donation of the food allows the low-income homemaker not to purchase rolled oats or even less, non-fat dry milk (the nearest retail CSM equivalent).

To the extent that the rations have an income effect, that is, if recipients save on food purchases and spend a large part of the savings on non-food items, then the rations may be an important tool in keeping food demand (and prices) down during shortages. The depressed demand on the other hand may, according to the program's critics, retard domestic production.

Conversely, if the ration and the nutrition education that accompanies it encourage the family to continue the same expenditure levels for food, then additional income is not realized. However, under

this model, food intake improvement ought to be more dramatic than under the first situation.

We have been unable to find any research in the Philippines that explores these issues. We believe that it deserves consideration as a research topic because of the important economic implications for the country. From indirect indicators, it would appear that in the Philippines the ration and the accompanying education are having a nutritional impact.* Whether this is because the families are eating more foods, more of the right food using the additional income for health benefiting expenditures, or a little of both is still a question. AID/N is developing a methodology for evaluation of the food distribution programs. The impact of the program on income, buying habits, and general demand for food should be included in the study.

D. HEALTH

In the Philippines and in other countries clear connections have been made between infectious diseases and nutritional status. The relationship is particularly important among marginally nourished infants and young children.

The team did not explore the health/nutritional status relationships although we believe that the national nutritional planning process should give them careful consideration. Tables 8,9 show the magnitude of the disease problem for the age group at risk. We have suggested in a later section, that health interventions be examined; at first glance these seem attractive because of the increasingly close relationship among the outreach activities of nutrition, family planning, and rural health centers. In particular the planners should review benefits received from mass immunization campaigns and environmental sanitation programs.

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* See USAID sponsored program evaluations based on growth charts.

Table 8

Ten Leading Causes of Death, Philippines - 1968

All Ages and Target Groups

	All Ages	Under 1 Year	1-4	5-9
Pneumonias	43,444	16,430	15,757	3,203
Respiratory T.B.	28,097	201	846	354
Gastro-enteritis & colitis	14,795	5,322	7,096	1,478
Diseases of the heart	12,347	175	202	229
Bronchitis	11,978	5,418	5,234	759
Diseases of vascular system	11,948	102	115	131
Malignant Neoplasms	8,712	33	161	115
Accidents	8,100	188	888	888
Beriberi	7,982	4,892	790	178
Nephritis & Nephrosis	3,939	169	422	238
Other Causes				
Measles	2,129	556	1,321	196

Source: Department of Health, Disease Intelligence Center, Philippines Health Statistics, 1968, Manila, 1970.

The table above shows the importance of respiratory, gastro-enteritis & colitis, and deficiency diseases as causes of infant mortality. More than 50% of all deaths from pneumonias and bronchitis are found in the 0-4 years of age group. These causes account for nearly 60% of all deaths in this age group. Numerous studies have linked these particular diseases and poor nutritional status.

Table 9

Reported Cases of Leading Causes of Notifiable Diseases

Philippines - 1968

Cause	All Ages	Under one yr.	1-4	5-9
Pneumonia	77,861	35,623	20,295	5,904
Respiratory T.B.	122,269	940	4,311	3,441
Gastro-enteritis & colitis	179,129	35,290	64,282	20,774
Bronchitis	289,026	74,219	116,572	42,775
Beriberi	16,552	5,938	1,508	400
Measles	19,555	3,538	9,334	4,047
Dysentery, and forms	19,072	1,640	5,538	2,656
Influenza	336,143	12,399	40,736	52,476
TOTAL		166,049	262,676	132,473

Source: Department of Health, Disease Intelligence Center, Philippines Health Statistics 1968, Manila, 1970

E. FOOD HABITS

Food myths, taboos, food availability, and income combine to form food habits. In the Philippines several specialists have concluded that many food habits adversely affect nutritional status, particularly weaning practices and taboos during pregnancy and lactation.*

Breastfeeding

As in other countries, breastfeeding seems to decline, both in terms of the frequency of breastfeeding and age at weaning, as the population urbanizes. In an earlier study, Gutherie reported that among urban subjects 43% had been weaned at 6 months of age while in rural areas and small villages 30-50% of the children had not been weaned at 19 months. A more recent study by Bulatao-Jayme, cited above, indicated that on the average, urban infants were breastfed alone to 9.5 months while in rural areas nearby Manila nearly 14 months was the rule.

Reasons for weaning found in this latter study may offer some insights on how breastfeeding can be continued for longer periods.

Table 10

Reasons for Weaning

	Rural	Urban
Another Pregnancy	29.6%	21.7%
Inadequacy of Milk	12.9%	25.5%
Age of Child	12.0%	21.7%
Mother Working	11.5%	6.6%
Doctor's Advice	1.7%	3.8%

Source: Bulatao-Jayme (cited above)

* Helen A. Gutherie. "Infant Feeding Practices in the Philippines." Trop. Geog. Med., Volume 14, 1962. J. Bulatao-Jayme and Ramona M. Madlangsacay, "Infant Feeding and Weaning Practices in the Philippines: Northern Luzon, Southern Tagalog, and Western Visayas," Philippine Journal of Pediatrics, Volume 14, November-December, 1965.

Food supplements given to children in both regions begin about the sixth month, with cereals being the most popular food. Cereals alone continue to be the most frequently given food until 10th-12th month when 40% of the children are eating entirely from the adult diet. At the end of the first year, nearly 10% of the children will have received no supplement at all.

Condensed milk, because of its low cost, keeping qualities and sweet flavor, even with dilution, continues to be a favorite food for the infant instead of breastmilk.

Breastfeeding in the Philippines sustains most children up to 4 months after which inadequate breast milk, insufficient weaning foods, and diseases cause declines in growth rates, signaling the onset of malnutrition. Nutrition planners may well want to focus on this confluence of factors in designing interventions. For example, pregnancy is cited in several studies as being the most important reason for weaning. How much is it worth to the nutrition planner to postpone pregnancy for 3-6 months, so that breastfeeding can continue? Inadequate milk also is frequently cited. Can supplements be designed specifically for lactating women so that breast milk continues in abundance? Can weaning foods be improved in quality? These and other questions may provoke nutrition planners into consideration of redesigned activities. For example, I am forced to ask myself: What will be the nutritional result on this vulnerable group of increased plantings of fruits and vegetables in home gardens when the infants are not given these foods even when eaten by the family and when the nutrients contained in these foods are not those in shortest supply for the children, nor are they ones which will supply the mother with the added calories, stimulating lactation. We are encouraged to find out that this year's backyard garden campaign will include root crops and corn as well as fruits and vegetables.

2. Foods During Infant and Childhood Illnesses

Even though the at-risk condition of many children is exacerbated during illness, in the Philippines and in other countries we know little about the feeding practices during these episodes. Moreover, from what we could learn, in medical schools, nursing schools, dietetic schools, and CRS and NNP nutrition education programs, nutritional care for the sick child is not stressed.

3. Consumption Patterns

The table below describes the food consumption of respondents in a national market sample, used by economists of the Department of Agriculture. To allow for seasonal variations, surveys were taken throughout the year.

Table 11

Average Rates of Use, 3 Surveys Philippines
(October-November 1970; May-June 1971; August-September 1972)

Per Capita Annual Income Group

	Less than P400	400-799	800-1499	1500-plus	All Families
	grms/capita/day				
rice & rice products	275	294	301.5	310	292
corn & corn products	70	49.8	28.4	25	49.1
wheat products	33	53.2	70.7	95.2	54.7
pork	15	29.7	46.4	63.4	33.2
beef & carabeef	7.4	12.7	21.0	31.5	15.4
canned & processed meat	1.7	4.7	8.4	14.8	6
chicken	9.1	14.8	22.1	31.7	16.8
duck	.1	.15	.3	.5	.2
other	.2	.08	.87	.45	.37
eggs	7.3	13.7	21	27.5	15.1
fresh & frozen fish	50.2	66.4	78.2	79.7	65.2
dried & smoked fish	11.4	12.2	13.1	13.1	12.2
crustaceans & mollusks	8.0	14.1	17.8	22.8	14.1
canned fish	3.5	5	5.2	5.8	4.7
evaporated milk	8.0	16.8	28.5	33	18.5
condensed milk	5.7	9.1	8.8	8.1	7.7
powdered milk	.6	1	4.2	5.2	2.2
fresh	.9	1.5	3.1	4.2	2.1
cheese	.3	1.1	2.67	4.1	1.6
other	.9	1.8	3.5	5.2	2.3
fresh fruit	108	130.1	182.2	189.4	144
leafy & yellow vegs.	33	38.7	46.7	54.8	40.7
fruit vegetables	52	63.8	77.4	89.8	66.4
legumes	14	18.4	23.5	28	19.7
roots & tubers	38.7	43.2	42.2	43.8	42
cooking oil	6.5	12.1	15.1	20.7	12

Source: E. L. Santos, Darrah, et.al., "Income and Food Consumption"(Average data for 3 surveys) "Marketing Research Unit, National Food and Agricultural Council Department of Agriculture and National Resources," May 1973

The following Table gives some insights into regional differences in food consumption, even though the information is somewhat dated.

Table 12

Food Consumption in the Philippines
(grams/capita/day) (Edible portion)

	Manila	W. Visayas	Ilocos Province	S.W. Mindanao	Cagayan Valley	S. Tagalog
Rice & Rice Products	240.	347	391	229	267	309
Pan de Sal	38.7	N/A	4.3	N/A	N/A	N/A
Corn & Corn Products	.64	78	14	102	71	N/A
Roots & Tubers	11.26	27	43	37	47	44
Dried Beans	7.04	9	19.7	5	13.4	7
Mongo	2.44	5	10.02	2	6	3
Meat & Fish	101.36	72	76.33	77	74.9	67
Fish, Fresh & Dried	38.0	39	43	64	42	42
Eggs	11.03	3	5.9	3	5	6
Milk & Milk Products	73.75	22	20	20	22	27
Evaporated	60.5	9	12	10	14	16
Condensed	4.54	6	2	N/A	3	10
Powdered Whole & Skim	9	N/A	4	N/A	2	N/A
Soft Drinks	17.9	6	6.4	6	4.8	6

Source: National Science Development Board, Food and Nutrition Research Center, Nutrition Surveys 1962-1969, Various Volumes

Income elasticities for food items have been developed through a series of national surveys. The following table depicts the portion of increased income that would be spent on specific food items. Responses are averaged for all income groups.

The table shows that staple grain consumption (rice & corn) will increase little as income increases while wheat products consumption will increase rapidly, especially in rural areas. Whole milk exceeds even fresh meat in desirability in the cities.

We can expect that as the population urbanizes, wheat product consumption will rise at the expense of corn and, to some extent, rice. If rice continues to increase in price while wheat remains stable, we can expect that more and more low-income families will turn to wheat instead of rice. Fresh meat and milk will also increase in demand with urbanization.

Table 13

[illegible] (Oct.-Nov. 1970; May-June 1971; Aug.-Sept. [illegible])

Item	Income-quantity elasticity	Income-expenditure elasticity
Rice & rice products (All)	0.07	0.18
Rice (All)	0.06	0.15
Magnolia	0.70	*
C-4	0.07	*
IR-8	-0.56	*
Rice noodles	0.44	0.56
Rice cakes	0.20	0.31
Corn & corn products (All)	-0.56	-0.53
Corn grits	-0.63	-0.63
White corn	-0.62	-0.61
Green corn	0.18	0.37
Wheat products (All)	0.56	0.49
Pan de sal	0.29	0.28
Loaf bread	0.91	0.89
Cookies	0.55	0.62
Wheat noodles	0.63	0.73
Wheat flour	0.60	0.67
Pork (All)	0.71	0.75
Lean meat	0.73	0.76
Meat w/ fat	0.77	0.81
Meat w/ bone	0.41	0.44
Pork chops	0.98	1.00
Beef, carabeef (All)	0.73	0.84
Lean meat	0.78	0.83
Meat w/ bone	0.51	0.69
Tenderloin/sirloin	0.90	0.98
Processed meat (All)	0.91	0.95
Corned beef/beef loaf	0.86	0.91
Longaniza/sausage	0.85	0.92
Chicken	0.65	0.66
Live	0.44	0.41
Dressed	1.00	1.04
Eggs, chicken	0.70	0.68
Dairy products (All)	0.67	0.74
Evap. milk	0.72	0.71
Condensed milk	0.20	0.19
Cheese	1.03	1.03
Sugar: White	0.49	0.52
Brown	-0.36	-0.35
Salt	-0.07	0.06
Fresh, frozen fish (All)	0.26	0.44
First Class (All)	0.50	0.61
Milkfish	0.64	0.70
Mackerel	0.40	0.62
Mudfish	-0.12	0.13
Second Class (All)	0.08	0.24
Slipmouth	-0.09	0.09
Tilapia	0.16	0.27
Third Class (All)	-0.06	0.07
Round Scad	-0.52	-0.17
Bonito	0.04	0.12
Dried, smoked fish (All)	0.08	0.17
Crust. & mollusks (All)	0.56	0.63
Shrimp	0.74	0.90
Crabs	0.57	0.78
Fresh fruit (All)	0.34	0.55
Bananas	0.29	0.43
Mangoes	0.30	0.56
Papayas	0.36	0.47
Pineapples	0.30	0.45
Fresh vegetables (All)	0.33	0.42
Leafy, yellow (All)	0.26	0.47
Cabbage	0.67	0.70
Camote tops	-0.06	-0.03
Kangkong	-0.07	0.05
Pechay	0.49	0.58
Fruit veg. (All)	0.27	0.39
Eggplant	0.14	0.25
Tomatoes	0.41	0.53
Squash	0.24	0.35
Upo	0.28	0.42
Legum. veg. (All)	0.33	0.41
Sitao	0.28	0.33
Mongo	0.24	0.31
Baguio beans	0.59	0.71
Roots, bulbs, tubers (All)	0.05	0.44
Sweet potatoes	-0.23	-0.06
Onions	0.32	0.46
Irish potatoes	0.74	0.84
Garlic	0.45	0.49
Cooking oil	0.61	0.50
Coffee	-0.20	0.42
Cocoa	0.62	0.73

Source: E. L. Santos, Dosayla and Darrah, "Income and Food Consumption (Average Data for Three Surveys)," Department of Agriculture and National Resources, Marketing Research Unit, Quezon City, May 1973.

F. POPULATION/FAMILY PLANNING

Current population is about 40,380,000 and growing at an annual rate of approximately 3.2%. The cooperative population planning program proposes to reduce this rate to 2.0-2.2% by 1976. The gross real impact of such a reduction in population growth rate would not be felt in the short run food supply problem owing to relatively small dietary requirements of infants. However the statistical impact on per capita global food production is significant and translated into real requirements within a decade. At current production levels a 1% reduction in the population growth rate is equivalent to 523,000 MT of Palay, 201,000 MT of corn, and 20,000 MT of meat and fish products, to take the priority food crops in the Agricultural Income and Production PROP. Put in terms of recommended nutrition requirements, this is equivalent to 279 billion calories and 7.9 million kilograms of protein.

An even greater direct impact would occur almost immediately on the greatest at risk target groups (preschool children, pregnant and lactating mothers). A 30% reduction in the birth rate would reduce the at risk group by about 1,500,000 children and consequently, by the same number of pregnant and lactating mothers.

Unfortunately, about 42% of the Philippine population is under 15 years of age. This leads us to believe that the population will continue to grow rapidly over the next fifteen years, even if birth rate (live births per 1,000 fecund females) declines, since the number of fecund females in the population will increase very significantly. A vigourous and successful family planning program would prevent the nutrition problem from becoming more severe, but probably cannot reduce current levels for a generation.

G. FAMILY SIZE AND SPACING OF CHILDREN

Research increasingly links nutrition and family size and spacing. Other things being equal, including family income, the size of the family would appear to be an important factor in nutritional status among low income families. One study of 771 children and their families showed a particularly strong positive relationship between large family size and malnutrition. The table below shows this relationship.

Table 14

MALNUTRITION IN INFANTS AND PRESCHOOL CHILDREN IN RELATION TO FAMILY SIZE RURAL (BARAS, RIZAL) AND URBAN (PASAY CITY) 1971-1972.

Family Size (No. of Living Children/Family)	Total Number of Children	MALNOURISHED								Total Number of Children	MALNOURISHED							
		RURAL (BARAS, RIZAL)									URBAN (PASAY CITY)							
		TOTAL		1st DEGREE		2nd DEGREE		3rd DEGREE			TOTAL		1st DEGREE		2nd DEGREE		3rd DEGREE	
	RURAL	No	%	No	%	No	%	No	%	URBAN	No	%	No	%	No	%	No	%
1	20	18	90.0	15	83.3	3	16.7	0	0	30	23	76.7	18	78.3	5	21.7	0	0
2	55	50	91.0	40	72.5	10	20.1	1	1.4	105	86	82.0	76	63.0	29	33.0	3	3.1
3	83	79	84.3	47	67.1	23	32.9	0	0	64	74	78.7	39	52.7	34	46.0	1	1.3
4	67	54	80.6	33	61.1	21	38.9	0	0	59	54	91.5	31	57.4	22	40.7	1	1.9
5	37	32	86.5	19	59.4	13	40.6	0	0	38	35	92.1	19	54.3	15	42.9	1	2.9
6	34	28	82.3	18	64.3	8	28.6	2	7.1	36	35	97.2	17	48.6	18	51.4	0	0
7	23	21	91.3	12	57.1	9	42.9	0	0	23	23	100.0	10	43.5	13	56.5	0	0
8	6	6	100.0	3	50.0	3	50.0	0	0	9	9	100.0	4	44.4	5	55.6	0	0
9	8	8	100.0	2	25.0	6	75.0	0	0	5	4	80.0	1	25.0	2	50.0	1	25.0
10 or more	6	4	66.7	1	25.0	3	75.0	0	0	3	3	100.0	3	100.0	0	0	0	0
TOTAL	369	301	84.0	200	64.5	107	34.5	3	1.0	402	348	86.6	198	56.9	143	41.1	7	2.0

Source: Virginia Balderrama-Guzman, "Child Health, Nutrition and Family Size: A Comparative Study of Rural and Urban Children," Unpublished, no date.

Additional studies on the relationship between family spacing and nutritional status have shown that a delay of one year or more between delivery and conception reduces the risk of malnutrition in the displaced child by more than 50%.

IV. RELATIONSHIPS IN THE PRODUCTION SUB-SYSTEM

A. GENERAL

The Philippines is a food deficit country, importing significant amounts of staple grains, fish, edible oils, and processed foods. This condition is expected to obtain, at least for the near term for rice, feed grains and oil seeds. Milk and meat will be imports for the foreseeable future. The latest food balance sheet provides an estimate of the imports of foods and of the food supplies in greatest deficits, according to national nutrition standards.

Table 15

FOOD BALANCE SHEET OF THE PHILIPPINES, CY 1970 (Summary)
(Final Estimates)

Population: 36,849,000

% Adequacy	Commodity	Food Net (Metric Tons)	Total Available Supply Per Capita				
			Kilograms per year	Grams per day	Calories per day	Protein (Grams per day)	Fat (Grams per day)
					95.9%	99.6%	91.2%
	TOTAL	13,467,338	365.6	1,001.7	2,097	54.2	26.4
([illegible])*	Cereal and Cereal Products	5,059,701	137.3	376.2	1,378	30.0	2.7
(101)	Roots and Tubers	1,089,476	29.6	81.2	86	0.7	0.1
(137)	Sugar and Syrup	607,975	16.5	45.2	174	-	-
(73)	Pulses and Nuts	211,386	5.8	15.9	30	0.8	1.7
(59)	Vegetables	1,063,036	28.9	79.2	21	1.1	0.2
(59)	Fruits	1,796,406	48.8	133.8	84	0.9	0.4
(85)	Fish and Other Marine Products	1,386,532	37.7	103.3	66	9.8	2.5
(85)	Meat Products	574,743	15.6	42.6	103	7.4	7.8
(29)	Milk and Milk Products	583,330	15.8	43.2	30	1.5	1.7
(48)	Eggs	110,689	3.0	8.2	12	1.0	0.9
(32)	Fats and Oils	112,913	3.0	8.0	70	-	8.1
	Miscellaneous	871,181	23.6	64.7	43	1.0	0.3

*All figures in parenthesis () are percentages of adequacy of current availability foods compared with recommended intakes by FAO.

Rice is the most important crop of the country; it is the major staple of about 80% of the population; more land is planted in rice than in any other single crop; its production makes the greatest single contribution to the value of agricultural production; and more farms and their families are involved in rice productions than any other crop.

B. PRODUCTION CONDITIONS: STAPLES GRAINS

One doesn't have to search far to learn the proximate cause of production limits. Among fourteen major rice producing countries, the Republic of the Philippines ranked thirteenth in yield per acre in 1965. Among fifteen major corn producing countries, it ranked fifteenth.

The Philippines has very good land resources - about one fourth hectare of arable land per capita, and considerable undeveloped potentially arable land. It has the capacity to produce much better yields. The excellent research facilities of the International Rice Research Institute, the research facilities of the College of Agriculture of the University of the Philippines at Los Banos, and an impressive network of satellite research stations have seen to that. Farmers also have the awareness of and capacity to respond to this technology. This was demonstrated by the successful Miracle Rice program of the 1968-1969 year which used the high yielding varieties on a massive scale and permitted the Philippines to achieve self sufficiency in rice production for the first time in recent history.

Unfortunately, this high production was followed by two bad years caused by disease and flooding. When natural disasters combine with market uncertainties, limited credit and limited input availability, farmers begin to limit their risks by lowering the inputs applied and inevitably receive poorer yields.

The Masagana 99 campaign is an heroic attempt to "get it all together" again with USAID assistance and achieve on a more permanent basis the self sufficiency that was in reach following the Miracle Rice Program. Information and seed are available and the credit bottleneck seems definitively broken. Fertilizer may become limiting this year. Assuming that production limitations are overcome, and yields are well above average, then the ability to clear the market of excess grain becomes a major problem. The willingness of small farmers to continue to produce at high cost depends on renumerative and certain returns and this requires that the market move the grain out at harvest without severely breaking the price.

The GOP does not own storage, but it authorizes bonded warehousing. Unfortunately, the supervision wasn't very good and carryover stocks disappeared in 1970 and have not been reestablished. If the Government is to perform responsibly in encouraging high sustained agricultural production, it must bring stability to the rice market. The most effective way of doing this is to establish a support price at sustainable levels, i.e., sufficiently below anticipated wholesale prices to offset storage costs. This stabilization program must be accompanied by a rebuilding of stocks to offset both seasonal fluctuations in production and overcome some level of natural disaster. The bulk of both the price stabilization and buffer stock programs 1/ can be handled through effectively supervised private warehousing. However, effective supervision may require that the Government maintain a minimum buying, storage and selling operation to reduce speculative pressures. In an insular nation like the Philippines, consideration should be given to barge or ship storage.

1/ The Marketing Research Unit of the National Food and Agricultural Council have published two reports on these subjects which can serve as background material to develop such a scheme: E. P. Abarientos, et.al., "A Possible Price Support System for Palay," January 1973, and R. D. Torres, et.al., "A Buffer Stock Scheme for Rice and Corn in the Philippines," March 1973.

C. GENERAL CHANGES IN SUPPLY

Table 16

Production Indices for Major Foods
(1961=100)

Year	Mongo	Palay (rough rice)	Corn	Soyabean	Fish	Population
1961	100.0	100.0	100.0	100	100	100
1962	97.4	105.5	104.7	108	106	
1963	76.0	107.1	105.2	92	120	
1964	80.0	103.7	106.9	78	132	
1965	73.4	107.8	108.5	73	146	
1966	67.2	109.9	114.1	59	155	
1967	56.4	110.5	123.2	58	164	
1968	65.1	123.1	133.9	65	206	
1969	61.2	120.0	143.3	62	206	
1970	64.0	141.0	166.0	62	217	
1971	65.0	144.0	165.8	N/A	N/A	134

Source: Department of Agricultural and Natural Resources, Bureau of Agricultural Economics, Handbook of Philippine Agriculture and Natural Resources, Vol. I 1971 Edition; Department of Trade and Tourism, Bureau of the Census and Statistics, Central Research Division, "Summary of the Population Projection by Province and Sex 1970-1980," and "Census of the Philippines 1960: Summary."

V. RELATIONSHIPS IN THE MARKETING SUB-SYSTEM

A. GENERAL

Until recently, food marketing had received little attention from scholars or government officials in the Philippines. Rice, of course, had been an exception to this. However, in the last five years, several specialists, with the assistance of an American economist, have begun a systematic study of the principal market forces in the Philippines.

One of the early publications of this group was a book, Agricultural Marketing in the Philippines.* Although this is a text for university classes, it is the only publication drawing together data on the broad range of agricultural products and marketing practices throughout the islands. Much of the following section will be based on this text and on subsequent studies undertaken by Dr. Darrah and his associates.

B. MARKETS

Metropolitan Manila is the largest single market in the country, with about 8-10% of the total population. The area has, however, about 30% of the country's total wholesale and retail outlets. It is the major international trade center, accounting for nearly one-half of the exports and imports. Four other cities, Debu, Iloilo, Davao, and Zamboanga are the principal regional market areas. They also move about 25% of international trade. There are numerous secondary and minor markets serving sub-provincial areas or several municipalities.

A large portion of the agricultural production is marketed, but because much of it is perishable, most of the population is rural and dispersed throughout the islands, and because market transport is slow and of moderate volume, most food is not marketed far from the area of

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* L. B. Darrah and F. A. Tiongson, Agricultural Marketing in the Philippines, University of the Philippines, College of Agriculture, Los Banos, Laguna, Philippines, 1969.

production. Rice and corn are the two main exceptions to this, excluding, of course, the export crops.

C. MARKETING PROCESS

Food marketing proceeds in stages from the farm gate to the consumer, and even though there are thousands of wholesalers and intermediaries, the marketing system seems generally efficient and not over-priced. There are however a number of areas for change that would improve marketing functions.

Country assemblers are the first level of marketing bringing together the production of many small farmers. Most specialize in a number of related crops such as fruits or vegetables, although for import/export crops such as corn and tobacco, single crop assemblers are common. The assemblers are generally only a little more sophisticated about prices and quality standards than the farmers. Although weekly wholesale price quotations are now available to the public, they are of little use because price is not associated with volume or quality standards. This group of buyers will have to become much more aggressive if the product of the backyard gardening campaigns is to reach the urban market.

Wholesalers can be divided into two groups: those that operate in the production areas and those that are located in or near the urban areas. According to the 1961 Census of Commerce, nearly 80% of the raw product wholesalers deal predominantly with non-food products-copra, fibers, tobacco, and timber. They account for an equal proportion of gross receipts. Nearly 90% of the wholesalers are small operations, with average sales of about $60,000.

Retailing

Four types of retail outlets serve most of the population. Supermarkets are of growing importance in urban areas, though they are generally confined to middle and upper income areas. A few chains are beginning, though they cannot yet claim a significant portion of the retail market. The research team was unable to determine if prices in supermarkets differed from other retailers. We did note that the supermarkets have not begun to compete with the public markets for abundance and quality of fresh produce.

Sari-sari stores are found everywhere and range in size from tiny roadside stands to large urban centers. Products are almost entirely non-perishable.

Public markets are found in all parts of the country; most urban areas have dozens (Manila has over 30). Even the smallest village has a market that may be open but one day per week. One public market studied had more than 600 vendors, 134 in fresh vegetables alone; with this large number of vendors, control of quality, sanitation, and price is very difficult. However, there is little evidence to suggest that public markets are being replaced by supermarkets.

Roadside markets are a minor aspect of retailing. Generally they market only seasonal fresh produce.

Taxes. The amount, type and enforcement of taxes on retail food was not determined.

Waste. We were unable to find studies on storage capacities, waste in storage at various levels, in processing, and information supporting claims about the economic value of improving storage. Waste due to poor handling is especially important if the "Green Revolution" is to yield greater income for small vegetable farmers.

VI. RELATIONSHIPS IN THE PROCESSING SUB-SYSTEM

If milled grains and sugar are excluded, domestic consumption of commercially processed foods is very low. This is particularly true of low income groups. There are, nevertheless, processed foods found in the most remote sari-sari stores, and they are consumed regularly, though in small quantities by all income groups. Evaporated milk and bottled soft drinks are two of the most widely distributed and consumed processed foods.

Rice milling is widely dispersed throughout the country, and it is difficult to identify any group of mil that controls a significant share of the market. In 1967 there were 1715 large rice mills and 7892 smaller mills serving the smallest farmers. Although these numbers vary according to abundance of the rice crop, it is easy to understand the difficulties that the rice enrichment program encountered.

Wheat milling, on the other hand, is highly centralized with only eight mills, six of which are located in or near Manila. Nearly all wheat is imported, encouraging location of mills close to ports. Wheat flour made from imported grains is one of the more important processed foods. Baking, however, takes place in thousands of small shops throughout the country.

VII. CURRENT PROGRAMS AND POTENTIAL

In the preceding sections the nature and extent of the malnutrition problem have been outlined and some of the characteristics of the food system, including consumer, production, marketing, and processing subsystems have been briefly mentioned. This report will now address the basic questions:

- What is the potential of the current nutrition programs for meeting this problem?
- What are new program directions that merit consideration if malnutrition is to be reduced significantly?
- What steps could be taken in the near term to begin new programs?

A. Food Distribution Programs

The potential of the Philippines food distribution programs for solving the nutrition problems of the target group depends on several factors:

- The number of individuals in the target group
- The extent of their nutrient deficit
- The costs of purchase of acceptable foods to supply needed nutrients
- The cost of administration of the program
- Costs of program support
- Ease of participant enrollment
- The response of participants to education for food habit changes

Since it is unlikely that donor agencies such as AID and World Food Program will have the food and financial resources to feed most of the malnourished over many years, the ability of the Philippine government to assume a greater share of program expense is a crucial factor in assessing program potential. The answer to this question depends in large part on cost information obtained from the first set of questions. Quite apart from these issues is the interest of the Philippine government

in allocating additional public resources* to reduction of the malnutrition problem. There appears to be considerable official interest in doing "something" about malnutrition in the Philippines. This interest stems in large part from the direct intervention of the First Lady, Mrs. Imelda Marcos, in the government's priority setting process. Within recent months this interest has been translated into financial commitments by government agencies for some non-traditional nutrition expenditures. However, it is clear that few decision-makers are convinced that a better nourished preschool population should have a high priority among development objectives.

The activities of the Government of the Philippines will be discussed later in the context of what additional steps might be taken and how AID might assist them.

In the section that follows, our assessment of the AID/CRS/GOP feeding program for infants, preschool children, and pregnant and lactating women will be presented. We have structured our report in the following pattern:

- What does this program do now?
- What will be its future impact, given projected PL480 food resources?
- What steps are likely to be taken by USAID/P, CRS, or GOP that will increase the impact in spite of declining PL480 Title II food resources?

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* There have been several attempts to calculate the amount of public funds spent on nutrition projects. Rather than undertake this effort again, we accept the estimates developed by the Checchi team in 1971. Significant changes since then will be noted in this report. However, Checchi and others have omitted one of the most significant nutrition expenditures of the government: purchase of rice in the international market and its sale below cost in the domestic market. This program, more than any other, has maintained stable retail rice prices in spite of chronic shortages. Though the nutritional impact of this program has never been calculated, it should be considerable.

A separate section of this report will consider some of the alternative projects and activities that could be undertaken by AID, GOP, and others that might reduce target group malnutrition using non-PL480 Title II foods, including programs other than free food distribution.

Programs for reaching preschool children, infants, and pregnant and lactating mothers supported by USAID in the Philippines are: the National Nutrition Program (NNP)* headquartered in the Department of Health and the Targeted Maternal-Child Health Programs (TMCH)* supported and administered in large measure by Catholic Relief Services (CRS). The NNP is experiencing a diminishing budget and its leadership exercises diminishing influence in nutritional planning in the government. The study team could find little evidence to suggest that this trend should be reversed. NNP directors were unable to provide the team with information that the program could achieve its objectives, even in their most modest formulation. In all fairness, however, we should note that the NNP probably has been responsible for a large measure of the awareness of nutrition in government agencies and the general public. However, this report will focus on the TMCH approach found in parish houses, churches, civic centers, and health centers throughout the country. The personnel of the NNP will be considered as resources for use in current or new nutrition programs that might be undertaken by USAID/P or GOP.

1. Description of the Maternal Child Health Feeding Program

a. Size of the Target Group

The target group is comprised of infants and children 6 to 60 months and pregnant and lactating women. Based on USAID and GOP estimates,

*The NNP Program uses the mothercraft approach, i.e., children and infants are fed at the center by the mothers who receive intensive nutrition, child care, and home management training. The TMCH approach is more extensive, providing two-week or monthly rations accompanied by regular weighing of children and nutrition and home management classes. The current TMCH program has had several predecessor programs including a mothercraft approach similar to that currently found in NNP and a distribution pattern that had little concern for nutritional impact.

approximately 35% of all children in this age group are sufficiently malnourished (in the "severe" or "moderate" categories) to warrant inclusion in the program. Of the infants 6-12 months of age, about 75% will be considered eligible for a preventive program. Women will participate at the rate of one for every three children. Assuming no major changes in the conditions causing malnutrition, the size of malnourished target group 1973-1977 is represented in the following table:

Table 17

MALNOURISHED INFANT, PRESCHOOL AND SCHOOL CHILDREN *

	1973	1974	1975	1976	1977
Population	40,300	41,500	42,600	43,800	45,000
6-12 mos. (Preventive)	449	462	475	488	501
12-24 mos. (Curative)	488	503	516	530	545
25-30 mos. (Curative)	250	257	264	272	279
Sub-Total (Curative)	738	760	780	802	824
30-36 mos. (Curative)	250	257	264	272	279
36-48 mos. (Curative)	477	491	504	518	532
48-60 mos. (Curative)	453	466	479	492	506
Sub-Total (Curative)	1,180	1,214	1,247	1,282	1,317
TOTAL CURATIVE	1,918	1,974	2,027	2,084	2,141
TOTAL PRESCHOOL	2,367	2,436	2,502	2,572	2,642
SCHOOL (6-14 years)	2,785	2,869	2,945	3,028	3,111

* 6-12 mos. 75% of age group (implies 100% of age group in barrios with THW Centers)
12-60 mos. 35% of age group
6-14 yrs 30% of age group
Population based on slow fertility decline assumption of IBRD Population Sector Review.

Note: This table is based on projection of the percentage composition of age groups in the 1970 census. It does not take account of the impact of great numbers of new child bearers who will come of age in the 70's, tending to increase these numbers.

b. Food Resources Available

The PL480 Title II food available for regular distribution is declining, and it is believed by some that within three to five years the supplies of these foods except for emergencies will be severely limited. Food available for FY74 is less than in previous years, and only through reallocation of food from programs not serving the target group can the number of recipients be expanded. Food resources can be expanded also by purchase of foods on the world market, through PL480 Title I, or by use of unconventional local commodities.

FY74 allocations of corn-soya-milk (CSM), bulgar wheat, and rolled oats, the foods distributed to TMCH centers will be the following:

Table 18

PL480 TITLE II SHIPPING LEVELS TMCH FOODS FOR FY74
ACCORDING TO VOLUNTARY AGENCY

(thousand pounds)

	CSM	Rolled Oats	Bulgar Wheat
Catholic Relief	17,813	5,073	
Church World Service	1,164	739	1,256
Seventh Day Adventist	185	158	192
	19,162	5,970	1,448

At current rations* this amount of food will supply about 3.3 million monthly rations or about 400,000 annual rations. These estimates assume no waste. The CSM and rolled oats cost about $2.588 million.**

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*5.3 pounds CSM, 2 pounds rolled oats participant/month for CRS; 4 pounds CSM, 2 pounds rolled oats, 2 pounds bulgar for CWS.

**These values are based on current (May 1973) costs for the commodities estimated export market value plus ocean freight. Other methods of estimating costs are as follows: (continued next page)

Assuming that there is no change in PL480 Title II food supplies in the next few years and program operations remain essentially the same as today, we can anticipate that about 300,000 annual rations for children and about 100,000 annual rations for pregnant and lactating women will be available.

c. Nutrient Contribution of PL480 Title II Foods

Each monthly ration of 5.3 pounds CSM and 2 pounds rolled oats supplies about 13,500 calories and 650 grams protein or a daily equivalent of 430 calories and 20 grams protein.

The protein/calorie gap has been calculated by one researcher as follows:

Table 19

PROTEIN/CALORIE GAP FOR 12-60 MONTH OLD CHILDREN

Age Group	Calories RDA	Calories Intake	Proteins (grams) RDA	Proteins (grams) Intake
1-3 years	1,300	829	26	27.3
4-5 years	1,550	1,050	31	29.0

Source: Carman Intengan, "What is the Protein Gap," Philippine Journal of Nutrition, January-March 1972. We have adjusted downward somewhat the data given in the article for 4-6 year olds to more nearly represent averages for 4-5 year olds.

(cont.) Costs for PL480 Title II Commodities Distributed in TMCH (per pound)

	CCC Full Reimbursement Value	Estimated Export Market Value (EEMV)	EEMV Plus Ocean Freight
Rolled Oats	$.0670	.0657	.0977
Corn Soy Milk	.0900	.0883	.1189

The ration, if consumed daily and entirely by the child, would nearly fill the average gap for calories and fill by several fold the gap for protein. From interviews with program operators and review of evaluation reports, in most families the ration is consumed within one to two weeks after receipt and that the entire family takes part. This would tend to diminish the rations' contribution to filling the target group individual's intake deficit. Because of the inability of the ration alone to satisfy needs, program designers have included a vigorous program of nutrition education, child weighing, and home management training as part of the TMCH effort. The impact of the education program will be discussed below.

By aggregating the protein and calorie gaps of infants and children, the disparity between available PL480 Title II foods and the deficit is apparent.

When the average nutrient gap for the age of specific individuals is multiplied by the number of children thought to be malnourished, we can approximate the total nutrient gap. The 300,000 monthly rations currently available for children provide about 25% of the aggregated caloric gap and more than fill the protein gap. This, of course, assumes that the ration is consumed only by the infants and children. Aggregation is deceptive in another sense—it assumes that the additional nutrients will be distributed in exact proportion to the severity of malnutrition. This does not occur inspite of the best targeting of food resources.

The rations can be altered slightly so that a more appropriate calorie/protein balance is achieved. Given current costs, about 5% more rations could be purchased under PL480 Title I or II if the ration would be changed to 4 pounds CSM and 4 pounds rolled oats, without endangering young infants whose protein needs are relatively higher.

2. Probable Impact of the TMCH Program

The purpose of the TMCH program is to rehabilitate malnourished infants and young children and to prevent malnourishment among this group through preventive feeding at a very young age—6-12 months. Pregnant and lactating women are included in order to improve pregnancy outcomes and lengthen lactation.

Between 1973 and 1977, the expected end of the program, there will have been about 3.85 million individual malnourished children between the ages of 12 months and 60 months. In addition there will have been about 2.3 million individual infants between 6 and 12 months who will be eligible for the program. The Mission is determined to provide food for distribution for a large portion of this malnourished group, even if non-PL480 resources must be used. The former (unapproved) PROP and the PROP currently being drafted propose an identical number of food recipients.

Table 20

PROPOSED RECIPIENTS, INCLUDING PREGNANT AND LACTATING WOMEN
1973-1977
TMCH PROGRAM

Year	No. of New Recipients	Aver. No. Fed/Mo.	Children Rehabilitated per Year	Cumulative Children Rehabilitated
June 1973	0	400,000		
Jan 1974	0	400,000		
June 1974	50,000	450,000		
Jan 1975	50,000	500,000	204,800	204,800
June 1975	50,000	550,000	256,000	460,800
Jan 1976	50,000	600,000	281,600	742,400
June 1976	50,000	650,000	313,600	1,056,000
Jan 1977	50,000	700,000	345,000	1,041,000
June 1977	0	700,000	377,000	1,418,000

Using these figures the TMCH program will reach and rehabilitate about one third of all severely and moderately malnourished children during the years 1973-1977. In addition each year about 15% of the total recipients will be infants between six months and twelve months, regardless of their nutritional status. Finally, 20% of all recipients are mothers.

These figures are based on a number of assumptions:

. Food resources equivalent in nutrient value to current PL480 Title II rations will be available at needed levels.

. Rations will be distributed to the following individuals

20%	pregnant and lactating women
16%	infants 6-12 months of age
12.8%	severely malnourished infants and children
51.2%	moderately malnourished infants and children

. All infants and children who receive rations will be rehabilitated according to the following schedule

severely malnourished	24 months
moderately malnourished	18 months

. All food delivered to ports and distribution centers will reach recipients families.

. Administrating organizations are capable of organizing nearly twice as many centers as are in existence today, recruiting volunteers, and managing distribution.

. non-USAID resources will be available for management and administration.

Operational experience gained over the past few years will diminish the potential impact of the program. In the first place not all of the infants that enter the program are able to remain in it until their graduation; internal migration is important in the Philippines. In one study 30% of the children originally recruited for the TMCH program could not be reached six months after recruitment. Because some of these children may re-enroll in other centers, let us assume that 20% drop out and do not re-enroll, prohibiting their rehabilitation. This

assumption reduces those rehabilitated by about 280,000.

Secondly, evaluations suggest that even of those that remain in the program throughout the specified period, 20-35% are not rehabilitated on schedule. Using an estimate of 25%, this reduces the number rehabilitated by an additional 354,000.

Thirdly, let us assume that 5% of the food intended for the recipients never reaches them, but is lost to rodents, leakage, etc. This reduces the number of rehabilitations by 71,000.

Combining these short-fall factors still leaves about 715,000 malnourished infants and children being rehabilitated during the four year period, representing about 18% of the malnourished target group. Even if this amount should be reduced by additional inefficiencies that emerge as the program expands, the impact will be impressive.

These calculations have not estimated the number of children who having reached the "rehabilitated" weight-for-age remain at this weight or improve it and how many fall back after they are graduated from the program. As currently planned there is about one year between the last year of possible enrollment in TMCH and the first year of public school where the child will probably receive a NUTRIBUN daily.

Because TMCH is not a permanent solution, except to the extent that mothers change their food culture through the education and training programs, a high premium should be placed on interventions that will have a more lasting effect. Several of the activities currently sponsored by USAID and those proposed at the close of this report for investigation hold the promise of permanency of change.

Nevertheless, food distribution and nutrition education programs are necessary, even in the most affluent countries, and we can expect that a large portion of the Philippine population will continue to need assistance.

B. NATIONAL NUTRITION PROGRAM (NNP)

Since 1968, USAID has supported the National Nutrition Program (NNP) of the Department of Health with PL480 Title II food, other commodities, vehicles and salary support. This program, employing a mothercraft center strategy, attempted to use few PL480 Title II foods and encourage the production and consumption of nutritious locally grown foods. According to program design, the NNP was to set up primary mothercraft centers in a community with nearly complete NNP support. The primary center would be a demonstration of how adjacent communities could develop and support their own centers. The NNP staff then assisted communities to organize and start their own centers. Plans called for donation of buildings, materials, and volunteer time, and food was to be obtained for the most part, from community and home gardens.

After four full years of support by USAID, the NNP is no closer to achieving its objective of starting spontaneous growth of mothercraft centers in the country than it was at the outset. USAID is wisely eliminating support of this effort.

While on paper, the Mothercraft approach seems to be a low-cost method of mobilizing local resources, teaching mothers, and feeding children, its reliance on volunteerism and on the largese of civic groups and local governments whose revenues are very limited in low-income areas, is a major constraint on its widespread and long-term operation. The history of the NNP is evidence of these difficulties.

Table 21

Growth of Mothercraft Centers
1968-1973

Year	No. of Primary Centers	Duration	No. of Secondary Centers	Duration
1968-69	6	4 mos.	0	-
1969-70	30	3 mos.	40	1 week
1970-71	48	2 mos.	100	1 month
1971-72	102	2 mos.	180	"
1972-73	72	2 mos.	150	"

Source: Departments of Health, National Nutrition Program, unpublished.

The program managers were unable to report on the number of children served by centers whose operation had been inspired by the NNP and that were currently receiving technical assistance by NNP staff. Reliable cost of operation data for the program as a whole, the primary centers, or secondary centers were not available.

Reports of mothercraft centers in other countries suffer similar analytical shortcomings. Proponents of the approach rely more on emotional appeals than reasoned and documented arguments for the centers. Since mothercraft centers remain a popular method of rehabilitation in many countries and on the surface appear to be an alternative to reliance on PL480 food, AID may want to conduct research into the costs and nutritional results of this approach in the Philippines and other countries.

Recently USAID has redefined its relationship with NNP and has begun using the resources of this program to achieve mission nutrition objectives. In a Program Agreement signed in June 1973, NNP agreed to use its 40 field nutritionists to support, train, and supervise on a part-time basis the work of 320 Home Management Technicians and midwives

as they develop and manage additional TMCH centers at the barrio (rural community) level. If this program is successful, centers serving about 120,000 recipients should be established. Equally significant, the NNP would have developed an important role on the supplemental feeding programs of the country and would have helped realize cross departmental cooperation in nutrition.

C. OTHER GOVERNMENT NUTRITION ACTIVITIES

There are two other nutrition activities in the government that deserve mention since they further underscore the need for a dynamic nutrition center to be developed in government.

1. Nutrition Division, Bureau of Health and Medical Services

This division is part of the Bureau that manages the Rural Health Units (RHU) the most extensive health out-reach program in the Philippines. The Nutrition Division however consists of only a few professionals who serve in an advisory capacity to other divisions in the Bureau. The National Nutrition Program, also part of the Department of Health, has an outreach program, but to date it does not work through the Rural Health Units. The Program Agreement mentioned above may improve the intra-agency collaboration.

The Nutrition Division lists in the 1971-72 Annual Report of Bureau of Health Services as its accomplishments: continuation of its goiter control project, employing surveys and iodized oil injections; and preparation of budgets for submission to UNICEF for operation of malnutrition wards; nutrition training of health personnel, and the goiter project.

2. Maternal and Child Health Division, Bureau of Health and Medical Services

This Division also serves primarily in an advisory and trainer capacity, assisting RHU personnel to implement activities for the target age groups. The MCH division program does not include management of

feeding programs. Although the director of the division is a dynamic individual, the division has practically no budget, and can make little direct impact on the problem. It is, however, a powerful element in persuading Rural Health Unit personnel to cooperate in more aggressive MCH activities.

D. PRIVATE NUTRITION ACTIVITIES

Two private nutrition programs supplement government activities. Though as private groups they can be more flexible and innovative, neither organization has been especially daring in their programs.

1. Nutrition Foundation of the Philippines

A private, non-profit organization financed almost entirely by a drawing in the national lottery NFP is a valuable resource for action programs. It does not manage separate child feeding programs, but provides assistance on request to government, community or private feeding programs. Additional services include nutrition education and clinical/out-patient services for the public. One of their major contributions has been the promotion and development of local nutrition councils. Although more than 60% of those organized are inactive, the others (about 90) together with local promotion efforts of National Nutrition Program (Department of Health) and of NFAC (Department of Agriculture) serve to build the base for gathering some local resources for expanded supplementary feeding and nutrition education programs. Most of the areas given technical assistance coincided with the priority provinces of the Philippine National Food and Nutrition Program (NFAC-sponsored). The Foundation employs 13 dieticians/nutritionists and has an annual budget of approximately US $25,000.

2. Philippine Business for Social Progress

Inspired by a group of businessmen in Venezuela, the PBSP is involving itself in a number of socially beneficial projects. Nutrition improvement is a priority area. Activities to date are limited to

planning a community development project in new towns near Manila. The project will have a feeding and food production component. Program managers described the project's objective as the demonstration of a practical and economical way to meet nutrition problems. The project as currently designed will cost 3 to 5 times current costs of the TMCH program even when PL480 Title II foods are charged at CCC costs.

E. THE PHILIPPINES NATIONAL FOOD AND NUTRITION PROGRAM

A different but complementary approach is being undertaken by the National Food and Agricultural Council (NFAC) of the Department of Agriculture. By Presidential decree, authority to plan and coordinate government food and nutrition programs was given to NFAC. The two years since this authority was granted has been spent in organizing the process of coordinating several government agencies and private organizations on national, provincial and local levels.

This coordination is complex and difficult, however, since coordination efforts have been applied in only about one half of the provinces, some impact of the NFAC approach is evident in provincial governments and in a few communities. In addition, NFAC through one of the national level policy-making committees has recently committed itself to new steps in meeting the food supply problem: support of large scale market testing of an infant food, wheat flour extender and possible beverage base. This approach will be discussed in detail below.

Before NFAC was given this responsibility, the Food and Nutrition Research Council (FNRC) of the National Science Development Board had the authority to undertake national nutrition planning. But FNRC lacked the power to demand cooperation. Several agencies and personalities have been struggling to be recognized as the center of nutrition,

and while this kind of competition can be stimulating and encourage improved program performance, it can, on the other hand, drain energies away from accomplishment of nutrition goals. NFAC has brought a measure of order into the picture; a considerable improvement from what was reported a few years ago.

The National Economic Development Authority (NEDA) and the President's Economic Staff (PES) have not taken an active interest in nutrition planning or in the current programs, although, from all reports, the top officials of these two groups are among the respected in the country, and their agencies are among the most powerful. Planners and budget analysts in these key agencies would benefit by training in intersectoral nutrition planning, not because they will be preparing plans, but because they mus review agency appropriation requests. It is unrealistic to believe that NEDA or PES will assign full-time staff to nutrition planning in the near future.

The Department of Agriculture through NFAC seems to have filled a vacuum of leadership in nutrition planning and coordination. The strength of the Secretary of Agriculture's personality and the respect given to him by other cabinet members and the President are credited with many of the accomplishments of the program to date. However, the technicians charged with developing plans would benefit by exposure to inter-sectoral nutrition planning and more interaction with other national agency planners.

1. NFAC's Nutrition Plan

Although NFAC has the authority to develop plans and coordinate national nutrition activities, thus far efforts have been limited to selected provinces and to traditional activities. The list of on-going programs to be coordinated is formidible and illustrates the scope of

what is currently conceived to be nutrition activities.

- Nutrition training - Department of Education
- Nutrition education - Bureau of Agricultural Extension
- Supplementary feeding - Departments of Health, Education and Social Welfare, Agriculture, Volunteer Agencies
- School, home and community food production - Department of Agriculture, Department of Education, Fisheries Commission, UNICEF
- Nutrition rehabilitation ward - Department of Health, Volunteer agencies
- Food and nutrition research - National Science Development Board, Bureau of Plant Industry

The plan describes an elaborate but logical structure for coordination of activities among government and non-government agencies. We are convinced that several of these inter-departmental groups have made and will continue to make significant contributions to a more effective nutrition program.

Specific, and where appropriate, quantified objectives are proposed for each program; time schedule and targets are set forth for each activity; and at the close of the document an accounting of agency resources to be used to implement the proposed program is presented. In many respects the plan is a model of planning techniques; all that is lacking are PERT or CPM charts.

However, there are several shortcomings with the planning documents and with the general NFAC approach. In the first place, the nutrition plan does not attempt to ascribe a nutritional benefit, either in general or quantified terms to the many activities proposed. In other words, there is not clear link between the description of the problem and the activities proposed. For example, the problem analysis

points to inadequate calorie supply and consumption, yet community, backyard and school gardenists are urged to plant mostly green leafy vegetables for home consumption*. Secondly, the probable effects of proposed activities in other parts of the system are not considered. For example home gardens may increase food availability for a short time in many communities, but because of lack of storage or preservation facilities benefits are short-lived, and because of inefficient markets, benefits are not extended to urban areas.

Since nutritional benefits are not ascribed to individual activities, the plan cannot compare alternative strategies to achieve similar goals. The program tends to be a combination of traditional, already existing activities such as supplemental feeding, nutrition education, and agricultural extension. Failure to attribute benefits has also impaired the plan's ability to assign priorities among activities and among the problems to be attacked.

In the near future, NFAC nutrition planning staff should examine new ways of attacking specific malnutrition problems. For example, the entire subject of enrichment and fortification is not included as an action program, but remains at laboratory research level. Additionally, the effect of food prices on purchases and nutrient intake is not mentioned, though it may be one of the most important ways of affecting intake.

While the plan correctly identifies food production as a major barrier to improved nutrition, it does not go beyond increased plantings as the solution. The plan will be strengthened if it compares increases in other production inputs such as fertilizer, irrigation water, or credit, with acreage; or if it compares marketing and processing

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* This year home garden campaign includes corn as a short-term calorie crop and casava and sweet potato as longer term crops.

interventions with preferred production activities. For example, nutrient waste at the production, storage and processing levels is probably widespread in some foodstuffs and its partial reduction may yield additional supply increases comparable with that achieved through increased land in production.*

The above paragraph should not be considered as critical of the plan; nutrition planning is a complex continuing process. NFAC has made an important beginning with this document; however, what appears to be "best" solutions now should be continually reviewed by NFAC staff. From our brief investigation of government agencies, research institutes, and universities, we believe that most of the information for comparison of alternatives at a level of pre-feasibility studies is already available. More precise data can be gathered by operating agencies such as Bureau of Agricultural Extension if they are alerted to the data needs of the nutrition planners.

F. NEW VENTURES

1. Development of Grain Flour Extender and Infant Food

The most important decision made by the Management Committee of the NFAC has been to allocate about $50,000 for purchase of 300 MT of new instant infant food to be produced in a small batch process plant. The mixture will be packaged and market-tested as an infant food in several locations to assess the response of low-income and middle-income families. The product will also be tested for acceptability as an extender to the PL480 ration, either in mixture with existing foods or as a separate food. Trials will be made with the product in the Nutribun-the bread for the school lunch program. Five percent of the regular ingredients will be replaced by the mixture.

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* Data on waste is partial and contradictory, but if evidence from other countries is any indication we can expect waste of between 10-20% of rough rice in milling and higher waste among more perishable foods.

The food will be composed of banana flour, made from mature banana culls, and coconut paring flour, made from parings, a by-product of dessicated coconut industry. The proportions of the two ingredients and the nutritive value of the mixture are not known.

a. Costs of Production

Since the mixture will be made on a batch process, cost of production data from this short run will not be useful for establishing commercial production data. For this reason, it would be advisable for NFAC to appropriate a few more dollars and conduct a commercial feasibility study of the product. Knowledge of most factory costs are available in the Philippines: for example, marketing margins will be identical with other packaged foods; packaging costs should not vary from similar products; advertising may be lower since the government will be able to call upon TMCH and Rural Health Unit employees to promote the product; mixing costs should be similar to other flour products; raw materials costs, banana culls and coconut parings can only be estimated since these materials now have different end uses; raw material processing will have to be estimated since production is now limited to batch or less than full scale size; and overhead charges, based on industrial scale production.

About ten man weeks are needed to produce these data. From them, simulated plant runs can be developed varying the conditions of production and sale working on different assumptions about factor costs, estimates can be made about the conditions under which production of this product is feasible.

Cost of production can be estimated by a different method. Using the retail prices of foods for which this product would substitute, upper boundaries of retail price can be established. Unless and until price can be brought down to that level, large scale production for

commercial distribution is not feasible. For example, used in the Nutribun, the product should not exceed the cost of importing soy-fortified flour.

b. Government Role

The government may wish to intervene in the market place by lowering retail price through subsidies to the processor or others in the marketing chain. These subsidies may take many forms, and from experience in other countries, some assistance will be necessary at the outset of production. The pre-feasibility study of this product should thoroughly explore the nature of processor-government relationships. Since the successful manufacture of this food will affect Philippine foreign exchange, government financial planners should be included in preliminary discussions. Thus far they have not been.

2. Other Formulations

There have been several other attempts to develop infant foods using locally grown foods. The Food and Nutrition Research Center has developed and performed feeding trial tests on a mixture of mung bean flour, corn flour and non-fat dried milk. The mixture appears to be acceptable to children, and satisfactory growth was recorded when used as a supplemental food.* Other mixtures have used soya flour, peanut flour, sweet potato flour, and coconut flour. However these products have not been carried beyond the laboratory. The failure to carry these apparently good ideas beyond the laboratory is a major shortening of the nutrition programs of the Philippines.

3. Coconut Skim Milk

Under contract with AID/W, Texas A & M University has been working for several years to generate new coconut processes. As one part

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* Angelina Alcaraz-Bayan, et.al., "An Evaluation of MCM as a High Protein Food," Philippine Journal of Nutrition, July-September, 1972.

of this project, reasearchers have develcped a process for extracting oil, meal, and protein isolate from fresh coconuts. The process has been run under laboratory conditions in Texas and produced products of acceptable quality. The mix of products may allow the coconut skim milk to be produced at a reasonable price.

In order to give a more complete test of the process and test market the products, plans are underway to operate a pilot plant in the Philippines. Although the pilot plant's tests will give accurate data on costs, results will not be available for several years.

VIII. A SUGGESTED AGENDA FOR THE NEXT TWO YEARS

The USAID nutrition advisor, the Food for Peace Officer and certain offices in the Government of the Philippines have taken first steps that address the major problems of inadequate food supplies for distribution in the maternal child nutrition program.

A. TARGETING FOOD DISTRIBUTION

One of the most important steps was the targeting of food distribution to the most needy and of tracking the weight gains of participants. This program change is nearly completed in all centers, and the structure that CRS has developed for managing the food distribution seems sound and in need of only "fine tuning." Program managers may want to consider narrowing the target group even further by not distributing food to infants between 6-12 months who are not malnourished now. Further narrowing might be done by enrolling only infants under 30 months of age and their mothers, since this is the most crucial age.

B. NUTRITION EDUCATION

Another activity that appears to have improved program impact is the education in home management and nutrition that accompanies the TMCH food distribution. These activities, if successful, serve to extend the food supply by ensuring that donated nutrients reach the intended recipients and by increasing intelligent use of local food supplies.

Our impressions of the education program were limited to one class, interviews with nutritionists, with those who had evaluated the program (Asian Social Institute), and a review of preliminary tabulations from that evaluation.

We hesitate to draw any conclusions or make any recommendations on the basis of this limited exposure. The evaluation by ASI should provide important insights into the effectiveness of this activity.

From our experience in the United States and in other developing countries with nutrition education programs we are certain of the importance of making the education programs simple, addressing only a few key issues rather than trying to give an entire course in home economics to the participants. Furthermore, we have found that teaching techniques are a very important determinant of effectiveness. The great temptation of dietitians to lecture the mothers must be avoided. When the course outlines for nutrition education are available, these two criteria are among the most important in program review.

Mass media nutrition education has not been started in the Philippines even though the Church, sponsor of most TMCH programs, operates several national radio stations. USAID Family Planning have used an imaginative mix of communication tools, but we could not determine its effectiveness. In any general review of nutrition education, the use of media other than classroom or one-on-one should be given consideration. The NFAC nutrition planning process has designated a committee at the national level to review nutrition education programs of various agencies. This committee could be the vehicle to assess innovative education approaches.

We urge AID to consider providing technical assistance to the NFAC committee, Catholic Relief Services and others to improve nutrition education associated with the TMCH program and to stimulate new initiatives in this field.

C. NUTRITION PLANNING

As noted in Section IV, the National Food and Agricultural Council has been charged with nutrition planning and coordination. A four year plan has been published.

We believe that NFAC could benefit from and would be receptive to technical assistance in nutrition planning. The technical assistance should concentrate on helping the staff to consider activities that reach beyond the production level or that include more consumer related activities than merely nutrition education and food distribution. Another important area is assistance in assessing alternatives. Thirdly, current plans do not link activities with a nutrition result. This step, as noted earlier, would assist planners to evaluate program alternatives. Another area of assistance could be the development of a more persuasive case for allocation of national resources for solving nutrition problems. A final area for which assistance could be offered is in bringing the nutrition planning unit into more close contact with other national planning operations.

D. PRODUCT DEVELOPMENT AND TESTING

The developments of foods, based on locally grown produce, that could substitute for PL480 foods has not been aggressively pushed until the last few months. Development seems to have stopped at the laboratory level. A proposal to use sweet potato flour, for example, as the basis for an infant food deserves study from more than the bio-chemical point of view. A thorough review of conditions under which a crop might be used as an ingredient or a product might be successful commercially will demand a cross-sectoral approach that seems to be within NFAC's authority. NFAC's allocation of $50,000 for the banana/coconut mix is a major accomplishment. There are numerous other products whose feasibility could be tested with more modest budgets.

E. PRE-FEASIBILITY AND FEASIBILITY STUDIES

A series of studies to determine the wisdom of further investment is warrented. We are not proposing lengthy academic studies that will only add to the bookshelf. With pending opportunities for loan and grant financing of nutrition projects, the results of studies can

be put to immediate use. We have identified several subjects of studies that merit a quick first look; at the conclusion of this phase we may suggest that all be discarded or recommend some for more intensive study. These study areas are the following:

. Improved efficiency of rice milling: clean rice recovery rates vary by about 8% between the small local mills (Kiskisan) and larger, cono, mills. While the millings are currently captured for animal feed, their direct conversion into human food would be significant savings. A program correcting half of the inefficiencies would yield about 105,000 MT of rice, equal to about 24 calories per capita/daily.

. Health improvement: The interaction between nutritional status and the ability to withstand and recover from illness is generally accepted. The inverse relationship - the impact of disease upon the efficiency of utilization of nutrients is well-documented, but not commonly understood beyond the health profession. Nevertheless, febrile infections virtually offset the beneficial effect of ingested food, while the parasite absorbs a good deal of ingested nutrients. The presence of gastroenteritis, parasitism, tuberculosis, malaria and similar diseases, and their relatively high incidence among poorer income groups suggests a fairly high impact on nutritional status. The significance of this impact is more impressive when we consider that it occurs at the end of the production-distribution-consumption chain, i.e., after the food has been purchased and after all intermediate losses have been accounted for.

. Weaning food: The past weaning period (6-18 months) is a critical period in child development. The child is transferred from milk to the adult diet at a time when his ability to utilize such food is limited by his physiological capacity. Special highly nutritious weaning foods bridge the gap from nursing to autonomous choice. CSM has performed this function well in the TMCH program, with demonstrable acceptance. However, given the uncertainty of

future supply, it would be highly desirable to develop a weaning food based on local supplies.

. Flour extender: Wheat bread has a higher income elasticity of demand than any other cereal. The existing trend in the Philippines (and elsewhere) is an ever higher importation of wheat grain or flour to satisfy the demand stimulated by development. There is considerable evidence that coconut and other non-grain flour can substitute to the extent of 6 to 10% for wheat flour without changing baking quality. This could stretch current flour imports by 30 to 50,000 MT, equivalent to 8 to 22 calories per day per capita.

. Vitamin supplementation: Vitamin A, Riboflavin and Vitamin C are all significantly deficient in the average Philippine diet. These deficiencies are probably the result of food habits, although there is some evidence that the high price of Vitamin C-rich foods may limit consumption. There was a heavy emphasis on vegetable planting in the Philippines last year and this may help to overcome supply shortages and encourage consumption. A chemical solution may prove more economical, however, through use of vitamin pills and/or fortification of soft drinks or other widely consumed products.

. Backyard and community gardening: For several years backyard and community gardening has been advanced as an effective method of improving the nutritional status of vulnerable groups. Considerable resources have been spent in the last two years on encouraging home cultivation, and recently some have proposed that as PL480 Title II foods diminish the production from these gardens will supply the balance needed. Before further investments are made in TMCH infrastructure (nutritionists, vehicles, etc.) the ability of backyard gardening to supply the needed nutrients in an acceptable form should be investigated. Because the program is already underway for this year, the evaluation cannot be completed until approximately February 1975.

Draft Nutrition PROP
prepared for US AID/P by
ATAC consultants Albert Brown and Thomas Cooke
during field visit 7/16 - 8/3/73

A. RATIONALE:

1. Food Supply Inadequacies

The Philippines is a food deficit country, depending on imports of staples, such as rice, wheat, dairy products, red meats and feed grains to make up the difference between production and effective demand. Production of nutrients is also deficient in relation to physiologic requirements, and because of inequitable distribution of nutrients among population groups, inadequate consumption is acute in many families. Tables 1 and 2 illustrate these relationships.

TABLE 1
TOTAL AVAILABLE FOOD SUPPLY PER CAPITA 1970

Nutrient	Supply	Percent Adequacy*
Calories	2,097	95.9
Protein	542 grams	99.6
Fats	26.0 grams	91.2

Source: "Food Balance Sheet, 1970", The Statistical Reporter, Vol. XVI, January-March 1972.

* Adequacy is based on weighted averages in the population, using FAO Requirements.

TABLE 2
AVERAGE PROTEIN/CALORIE DEFICIENCIES

Region	Average % of Dietary Adequacy		Distribution of Inadequacy % of Households With Less Than 70% Dietary Adequacy	
	Calories	Proteins	Calories	Proteins
Manila & Suburbs			30%	20%
Manila	98.8	92.4		
Quezon City	83.8	95.6		
Pasay	84.7	97.4		
Rizal	70.6	88.1		

TABLE 2 (continued)

Region	Average % of Dietary Adequacy		Distribution of Inadequac % of Households With Less Than 70% Dietary Adequacy	
	Calories	Proteins	Calories	Proteins
Southern Tagalog	79.0	81.0	N/A	30%
Cagayan Valley Batanes Region	80.0	86.6	23%	18%
Southwestern Mindanao	74.0	86.0	40%	12%
Ilocas - Mt. Province	87.5	96.9	18%	14%
Western Visayas	75.0	88.0	37%	19%
Eastern Visayas	68.0	80.0	46%	24%

Source: National Science Development Board, Food and Nutrition Research Center, Nutrition Survey, Manila: 1962-1969, Various Volumes.

Inadequacies of intake are especially acute among infants, preschool children, school age children and pregnant and lactating mothers. In general, calorie deficiencies are more severe than protein; however, we believe that infants to about 18 months probably suffer equally from protein and calorie deficiency. If breastfeeding declines in the future, the protein inadequacies may become greater, relative to calories for this age group.

TABLE 3

Age - Specific Food Intake Adequacy

Philippines, 1959-1969

Age Group	RDA (Kcal)	Aver. Intake (Kcal)	% of RDA	RDA (grams)	Aver. Intake (grams)
Children 1-3 yrs.		829	64		27.3
4-6		1,103	69		30.3
7-9		1,301	68		39.0
10-12		1,439	63		42.2
Boys 13-15		1,547	55		49.0
16-20		1,695	61		49.6
Girls 13-15		1,547	67		47.0
16-20		1,352	64		40.2
Man		1,742	73		53.1
Woman		1,602	89		44.3
Pregnancy		1,464	64		43.7
Lactation		1,339	46		41.7

Source: Carmen Ll. Intengan; "What is the Protein Gap?" Philippine Journal of Nutrition, Vol. XXV, January - March 1972

Nutritional surveys have detected other deficiencies. In all regions, serum Vitamin A was in the deficient range for 60-95% of the respondents, and of the surveys that noted clinical findings, all but one stated that 15-20% of the population showed clinical signs of Vitamin A deficiency. Riboflavin follows a similar pattern though not as severe as Vitamin A. Vitamin C and calcium inadequacies were noted in food consumption surveys, food supply data and biochemical tests, but clinical signs were not evident.

3. RISK GROUPS

Infants, preschool children, pregnant and lactating women and school children in that order are considered to be the groups most vulnerable to the effects of malnutrition in the Philippines. The National Nutrition Plan has selected infants, preschool children, pregnant and nursing women as the priority groups. USAID concurs and selects elementary school children as a second priority for nutritional correction.

Infant mortality rates are approximately 70/1,000 live births with no evidence of decline in the last decade. This rate is among the highest in Asia. Deficiency diseases are rarely cited as causes of death, but the effects of respiratory, gastro-intestinal and infectious diseases, which are the direct cause of infant morbidity and mortality, are significantly worsened by poor nutrition.

Other indicators of the effects of malnutrition among infants and young children are weight-for-age measurements. Because the PL480 Title II foods for this target group are distributed according to nutritional need, the Food for Peace Program and VolAgs have accumulated data on the extent and severity of underweight among infants and children. Approximately 90% of all school age 7-14 years children are underweight for age. About 30% are believed to be malnourished (red zone of weight chart).

In order to narrow the target further, GOP, USAID and VolAgs have agreed upon revised weight standards. Using these revisions, approximately 5% of the children are severely malnourished (60% weight for age) and 30% are moderately malnourished (61-75% weight for age). These are preschool children who receive priority attention in the Targeted Maternal Child Health (TMCH) subproject.

No surveys of the nutritional status and effects of malnutrition on pregnant and lactating women are available for the Philippines.

MAGNITUDE OF MALNUTRITION

The table below provides an estimate of number of the moderately and severely malnourished children expected to be living in the Philippines during the span of this program.

TABLE 4

MALNOURISHED INFANT, PRESCHOOL AND SCHOOL CHILDREN*

	1973	1974	1975	1976	1977
Population	40,300	41,500	42,600	43,800	45,000
6-12 mos.(Preventive)	449	462	475	488	501
12-24 mos.(Curative)	488	503	516	530	545
25-30 mos.(Curative)	250	257	264	272	279
Sub-Total (Curative)	738	760	780	802	824
30-36 mos.(Curative)	250	257	264	272	279
36-48 mos.(Curative)	477	491	504	518	532
48-60 mos.(Curative)	453	466	479	492	506
Sub-Total (Curative)	1,180	1,214	1,247	1,282	1,317
TOTAL CURATIVE	1,918	1,974	2,027	2,084	2,141
TOTAL PRESCHOOL	2,367	2,436	2,502	2,572	2,642
SCHOOL (6-14 yrs.)	2,786	2,869	2,945	3,028	3,111

*6-12 mos. 75% of age group (implies 100% of age group in barrios with TMCH Centers)
12-60 mos. 35% of age group
6-14 yrs. 30% of age group
Population based on slow fertility decline assumption of IBRD Population Sector Review.

Note: This table is based on projection of the percentage composition of age groups in the 1970 census. It does not take account of the impact of great numbers of new child bearers who will come of age in the 70's, tending to increase these numbers.

5. SIGNIFICANT RELATIONSHIPS AFFECTING NUTRITIONAL STATUS

The nature of the program proposed herein arises from our experience in managing successful targeted maternal child feeding and primary school feeding programs and from our knowledge of some of the relationships that affect nutritional status of the population. These relationships can be grouped according to the functional areas of the food system:

a. Production - Nutritional effects of inadequacies in production are realized through higher prices, periodic shortages of some staples, regions of severe affliction, and during the summer of 1973, an increasing reliance on imported cereals or use of foods with lower nutritional values. It should be noted that with few exceptions, production will fill effective demand without providing adequate nutrients to the lowest income groups.

b. Processing - With the exception of milled rice, corn, and wheat products, processed food does not have an important role in the diet of the lower income groups. Nevertheless, some processed foods such as evaporated and condensed milk, beer and soft drinks are distributed nationally and consumed, perhaps in small quantities, by nearly every family. Such processed foods offer an opportunity for enrichment and distribution through commercial channels.

The most immediately apparent opportunity to improve processing is rice milling. Extraction rates are low, particularly in the kiskisan mills (about 60%). Cono mills yield about 67% on average, but this rate is still inferior to that obtained by larger, better equipped mills. Rice mills are widely decentralized and operate as an integral part of a traditional locality-specific marketing system, so upgrading will be difficult. Although reliable data are not available, we estimate that cono and kiskisan mills process equal portions of the national harvest.

c. Distribution - In general, the marketing of agricultural products is done efficiently in the Philippines. The small farmer, deeply in debt to the barrio buyer, may pay a high tariff to sell his product; but generally mark-up costs are not excessive. There are, however, considerable losses to the product as it passes through the system. Storage capacity for staples of rice, corn and dried legumes is inadequate in quality and quantity. This is particularly true at small mills. Handling of fresh fruits and vegetables contributes to the more than 20% loss of the produce sent to central market. Waste losses realized by the processors and distributors are reflected in higher prices to the consumer.

d. Consumers - Several characteristics of the groups most affected by malnutrition are causal factors of their nutritional status.

i. Income - Income of about 60% of the population is inadequate to purchase a diet that meets the full recommended daily allowances. About 50% of the population are members of families whose incomes are too low to buy adequate diets, just in calories and proteins. Even allowing for errors in fixing dietary allowances, and estimating income and food costs, the size of the population whose incomes are too low for nutritional adequacy without radical food habit change at least 35% of the total.

TABLE 5

Family Income and Foods Costs for Minimum Adequate Diet

Decile	Average Family	Annual Income*	No. of Families	% Income Spent on Food**	Annual Adequate Diet Cost	Difference***
1st		466		80%	1860	1,488
2nd		909		75%	"	1,198
3rd		1,318		75%	"	876
4th		1,728		75%	"	564
5th		2,191		62%	"	502
6th		2,748		62%	"	157
7th		3,416		45%	"	0
8th		4,432		45%	"	0
9th		6,307		32%	"	0
10th		13,850		32%	"	0

* Source: Office of the Director, Bureau of the Census and Statistics, Special Release No. 139-L, February 1973, "Family Income Distribution 1971, 1965, and 1961."

** Estimates based on Family Income and Expenditure Survey, 1965, Survey Division, Bureau of Census and Statistics.

*** The diet used was taken from a previous USAID/P study. The author up-dated cost information. Between the previous study 1970 and this one, the low-income consumer has gained almost no real buying power. The deficit between income available for food expenditures and costs of an adequate diet based on local food habits can be reduced somewhat for lower income groups by purchasing corn instead of rice; increasing purchases of beans replacing some of the dried fish, and growing food in backyard.

Increased income would have a powerful nutrition effect with an average income elasticity for food of about .60. However, income increases sufficient to bring effective demand in line with nutritional needs are in the distant future for a majority of the low-income consumers. Real income of low-income groups is growing slowly, and little progress has been made toward a more equitable distribution of personal incomes.*

ii. Population Growth, Family Size and Spacing - Growth of food production and population have been about equal during the last decade, indicative of the lack of progress in achieving real per capita growth. The current family planning and rice production programs may alleviate this pressure.

The number of preschool children in the family affects nutritional status among low-income families. Child spacing also was shown to affect nutritional status. One study showed that among low-income families with one pre-school child 36% of the children were malnourished, however those with 3 pre-schoolers averaged 48% malnourished.

TABLE 6

THE IMPACT OF CHILD SPACING ON THE NUTRITIONAL HEALTH OF THE DEPOSED CHILD**

Child Spacing Interval (mos.)	DEPOSED CHILDREN: No.	% of Total	MALNOURISHED DEPOSED: No.	%
18	200	31.5	110	55.0
19-30	330	52.0	117	35.4
31	105	16.5	30	28.5
Total	635	100.0	257	40.5

Source: "Report of the Bulacan Province Nutrition and Family Planning Program", Maria Minda Caedo, Victoria Santiago and R. W. Engel, December, 1972, in manuscript form, USAID Mission, Manila, Phils.

* Bureau of Census and Statistics, BCS Monthly Bulletin of Statistics, October 1972; Office of the Director, Bureau of Census and Statistics, "Special Release" No. 139, "Family Income Distribution, 1971,1965,1961".

** The deposed child is the one no longer nursed because the next baby has arrived.

iii. Food Habits - Several specialists have concluded that many food habits adversely affect nutritional status, particularly weaning practices and taboos during pregnancy and lactation. Breastfeeding is declining in the Philippines as the population urbanizes. One study reported that among urban children, 43% had been weaned at 6 months; while in small villages, 30-60% had not been weaned at 19 months. Weaning foods are introduced at about 6 months; by 10-12th month, 40% of the children are eating entirely from the adult diet. Traditional weaning foods are overly bulky for a one-year old child to receive adequate nutrients. Food habits during a childhood illness are especially critical since it is at this time that the marginally malnourished child is particularly threatened. Reliance on rice water and low-valued foods compounds the problem. Nutrition education in combination with other factors can change food habits. Current TMCH programs have extensive nutrition education programs.

6. NUTRITION IS A PRIORITY IN THE GOVERNMENT

Within the past five years, nutrition has been recognized by GOP as an important element in their development strategy.* National Food and Agricultural Council has been given authority to plan and coordinate a national nutrition policy, bringing together more than a dozen agencies that have programs that affect human nutrition. In addition, government expenditures that directly affect food consumption have increased in the past few years; these expenditures are for such diverse programs as rice imports and retail price controls, expanded credit to small rice farmers, administrative support for TMCH and school feeding programs, research, pilot plant and test market funds for new, low-cost foods for infants and young children, and supplies and technical assistance for backyard and school grounds gardening.

Moreover, interest in attacking the malnutrition problem is also evident among private groups, especially the local church groups working with US VolAgs and some civic organizations.

USAID Experience

USAID experience of the last five years enables us to undertake a program of the scope and magnitude proposed in this document. USAID and VolAg staff have gained knowledge about the nutrition problem and program possibilities in this country.

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* Include statistics on GOP budget allocations for nutrition, including imports of rice, wheat, production (Masagana 99).

Some accomplishments over the past few years are:

. development and installation of a national rural and urban MCH program targeted to the most nutritionally deficient children.

. assisting in the development of the NUTRIBUN, a nutrition package for school feeding susceptible to substitution of some donated ingredients with local foods. NUTRIBUN provides 500 calories and 17 grams protein, enriched with vitamins and minerals.

. initiation and sponsorship of research on new local foods to replace donated foods on infant feed.

. sponsorship of research on the extent and severity of the malnutrition problem.

. collaboration in an intersectoral nutrition analysis.

. initiation of joint planning and implementation of family planning and nutrition activities.

. conduct of evaluations of the effectiveness of nutrition education and supplemental feeding.

B. Overview of Intersectoral Nutrition Program

Improvement of nutritional status is the most immediately apparent result of socially concerned economic development. The ingestion and metabolism of nutrients results from a variety of conditions and activities: income growth and distribution, population changes, foreign trade, agricultural production, processing and marketing, nutritional education and health and sanitation. The GOP is committed to achieving a consistent per capita annual growth rate of , while the New Society seeks to release the energy of the Philippine people in productive enterprise that will improve their individual condition.

The USAID program which supports these broader goals includes three activities directly bearing on improvement of the nutrition situation described above:

- Population Planning
- Agricultural Income and Production
- Human Nutrition Program

The first two are described in detail in separate PROPs, but their very significant nutritional implications are discussed here. The broad impact of the successful accomplishment of the objectives of these activities increases the effectiveness of the more directly targeted activities of the Human Nutrition project.

1. Population Planning

Population of the Republic of the Philippines is growing at a rate of approximately 3.2% per year, requiring commensurate increases in equitably distributed economic growth and in agricultural production just to maintain the current deficient nutritional status. Clearly, any reduction in population growth rate will reduce the development task and facilitate widespread nutritional adequacy.

The family planning program has its most direct impact on those groups considered most at risk nutritionally----------preschool children and pregnant or lactating women. The projected averting of one-third of currently expected births by 1976 will reduce the target group to about two-thirds by 1980.

Improved spacing and smaller family size encouraged by family planning will have a significant impact on the nutritional status of individuals within affected families. Recent investigations in low-income Philippine neighborhoods* show a high correlation between family size and spacing and the frequency of malnourished children in the family:

TABLE 7

	Number of children		
	1	2	3
Percent of Children Malnourished	36%	39%	49%

	Months between births	
	18	30
Percent of Children Malnourished	55%	25%

2. Agricultural Income and Production

Food production in the Philippines is closely associated with the internal effective demand, which is primarily governed by population growth.

* (Study Citation).

Rice and corn together account for over 65% of the energy value of food as purchased and more than 75% of the food of vegetable origin available for consumption. The agricultural production and income PROP is strongly focused on rice production, but includes a number of other subprojects which will affect both quantitative and qualitative aspects of the food supply.

TABLE 8

Production and Income Targets for the PROP - Agricultural Income and Production

		TARGETS		
		Increase in Production	Increase Annual Farm Income	Participating Farms
Rice	EOP '76	200,000 MT	P150	440,000
Corn/Sorghum	EOP '78	230,000 MT	P200	40,000
Livestock	EOP '76	73,000 MT	P150	20,000

Three distinct nutritional impacts will result from achievement of these targets: (1) an increase in the gross availability of nutrients per capita, (2) an improvement in the diets of participating farm families as a result of increased income, and (3) a possible increase in general rice consumption resulting from lower prices. The magnitude of these changes may be illustrated by the rice subproject:

a. Increased Supply

Rice production (Palay) amounted to 5,233,000 MT in 1970 and would be expected to grow to 6.3 million MT*, by 1976, following traditional production trend lines. With no reduction in population growth rate, the daily per capita calorie supply from rice would be the same as now, approximately 950 cal. Achievement of the targeted production increase of 200,000 MT above traditional trend line by 1976 would increase the availability of energy by 27 calories per capita per day 1/, with no change in population growth rate.

* Agriculture & Natural Resources Development, FY 1972-75, DANR. 1971

b. Income Effect on Participating Farmers

Annual income of farm families averages approximately P2,800. At this income level, families spend 58 percent of their income on food, so that a family receiving P150 in increased income could be expected to purchase about P87 of food. One peso will buy about 2,500 calories of an average diet at current prices, so the additional income would provide an additional 85 calories per day to each member of a seven member family. This income effect applies to about 3,000,000 people or 7% of the total population (12% of the rural population). Other income producing subprojects will similarly affect an additional 60,000 farm families (420,000 people).

c. Price Effect

There is no way of forecasting the impact of an additional 200,000 metric tons of rice on retail prices in 1976, but some reduction is at least theoretically possible. With an 0.23 price elasticity of demand, a 10 percent decline in the price of rice would increase consumption by 2.3 percent, or 16 calories per capita per day. 1/

3. Human Nutrition Program

The Human Nutrition Program is directed at more specific targeting of nutrition problems which are not appropriately responsive to the broader impact of population planning and agricultural income and production. As such, it seeks to reach high risk targets whose nutrient status remains poor because of persistent inequities in distribution and to identify and promote opportunities for further nutrition interventions. It includes four subprojects:

a. Targeted Maternal and Child Health Program (TMCH)*

This subproject is directed at the highest risk target groups: preschool children and pregnant or lactating mothers. It provides for the supplementation of diets of identified clients through TMCH Centers supported by U.S. VolAgs, their Philippine Counterparts, the Department of Health and the Department of Social Welfare. (Continue after policy issues are resolved).

1/ These three effects are not directly additive, since there is some overlapping. For example, the farmers who benefit from the income effect are among the general population who benefit from calorie supply and price effects.

* To be described in detail by Mission.

b. Elementary School Feeding (Nutribun) Program - (Continue after policy issues are resolved)*

c. Nutrition Planning Assistance

Technical assistance will be provided to the staff of the National Food and Agricultural Council (NFAC) to assist it to fulfill its responsibilities as planner and coordinator of national nutribun activities. A four year national nutrition plan has been developed by NFAC and approved by the global planning agency, National Economic Development Authority. The plan, however, is limited in scope, failing to recognize the nutritional impact of many agencies' programs. Technical assistance will also be provided to assist other government planning agencies to recognize the potential nutritional implications of their activities.

d. Investigation of Further Nutrition Interventions

The establishment of more desirable trendlines in agricultural production and population growth still leaves nutritional deficits which cannot be fully covered by direct feeding programs. A number of additional possible interventions have been identified which could be used to increase the availability or improve the utilization of nutrients. This subproject provides funds to conduct pre-feasibility studies of the most promising interventions with a view to more intensive study and their subsequent implementation under loan or private financing. In the event that some interventions are selected for feasibility analysis, an amendment to this PROP will be submitted.

A number of these interventions fall under other development sectors. However, financing of their study under the Human Nutrition project is appropriate because of the specific impact sought. The interventions which appear most promising are the following:

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* To be described in detail by Mission.

(1) Improved Efficiency of Rice Milling. Clean rice recovery rates vary by an average of 8% between Kiskisan and cono type mills. Within mill type classes, a two percent recovery rate difference is common between efficient and inefficient mills. A program which successfully corrected half of these differences would yield about 105,000 MT of rice, equal to 24 calories per capita per day. 1/

(2) Health Improvement. The interaction between nutritional status and the ability to withstand and recover from illness is generally accepted. The inverse relationship - the impact of disease upon the efficiency of utilization of nutrients is well documented, but not commonly understood beyond the health profession. Nevertheless, febrile infections virtually offset the beneficial effect of ingested food, while the parasite absorbs a good deal of ingested nutrients. The presence of gastroenteritis, parasitism, tuberculosis, malaria and similar diseases, and their relatively high incidence among poorer income groups suggests a fairly high impact on nutritional status. The significance of this impact is more impressive when we consider that it occurs at the end of the production-distribution-consumption chain, i.e., after the food has been purchased and after all intermediate losses have been accounted for.

Pollock and Sheldon have calculated the losses of calories associated with cases of malaria, tuberculosis and dysentery. A conservative indication of the caloric losses associated with each disease in the Philippines is provided in the following table. The relative effect of these losses are probably exaggerated in the target group.

TABLE 9

Disease	Caloric Loss per Case	Reported Cases Annual 63-68 Average	Caloric Loss Million Calories
Tuberculosis	173,400	116,000	20,114
Malaria	71,800	32,800	2,355
Dysentery	49,900	203,000	10,130

1/ Rice lost through inefficient milling is not totally lost to human consumption. It becomes a part of the milling byproducts which, as livestock feed, are converted to another human food. However, the caloric costs are high. Grains convert to useful meat at ratios as high as 1:17 for beef to about 1:8 for swine. Assuming the latter ratio, 8 kilograms of rice containing 29,440 calories become 1 kilogram of pork, containing 5,130 calories.

(3) Weaning Food. The past weaning period (6 to 18 months) is a critical period in child development. The child is transferred from milk to the adult diet at a time when his ability to utilize such food is limited by his physiological capacity. Special highly nutritious weaning foods bridge the gap from nursing to autonomous choice. CSM has performed this function well in the TMCH program, with demonstrable acceptance. However, given the uncertainty of future supply, it would be highly desirable to develop a weaning food based on local supplies.

(4) Flour Extender. Wheat bread has a higher income elasticity of demand than any other cereal. The existing trend in the Philippines (and elsewhere) is an ever higher importation of wheat grain or flour to satisfy the demand stimulated by development. There is considerable evidence that coconut and other non-grain flour, can substitute to the extent of 6 to 10 percent for wheat flour without changing baking quality. This could stretch current flour imports by 30 to 50,000 MT, equivalent to 8 to 22 calories per day per capita.

(5) Vitamin Supplementation. Vitamin A, Riboflavin and Vitamin C are all significantly deficient in the average Philippine diet. These deficiencies are probably the result of food habits, although there is some evidence that the high price of Vitamin C rich foods may limit consumption. There was a heavy emphasis on vegetable planting in the Philippines last year and this may help to overcome supply shortages and encourage consumption. A chemical solution may prove more economical, however, through use of vitamin pills and/or fortification of softdrinks or other widely consumed products.

II. Goal Statement

1. The goal of the project is to improve quality of life of low income families in the Philippines. Rural and urban families receive priority ranking respectively.

2. Measurement of Goal Achievement

Young children who benefit from this project will achieve greater permanent physical and in some cases mental development than had they not participated. Weight for age of children will indicate the impact of the project. In the Targeted Maternal Child Health (TMCH) and School Feeding programs measurement of goal achievement is possible in the near term (3 - 12 months). A longer time period will be required (3-6 years) before improvement in children's weight for age ratio will be detectable.

3. Basic Assumption (for goal achievement)

Improved nutritional Status achieved through increased food intake will improve the quality of life of low income families.

III. Project Purpose

1. The purpose of this project is to:

a. provide supplemental feeding to malnourished children pregnant and lactating women between 1974 and 1977.

b. provide supplemental feeding to malnourished primary school age children between 1974 and 1977.

c. Develop a strong nutrition planning and project implementation capability in the GOP.

d. Develop and implement alternatives using local foods for PL 480 foods, or which public and private agencies in the Philippines purchase in foreign markets.

e. Develop extenders of current staple foods, highest priority will be given to imported foods, and for raw foods purchased by low income families for which an extender may lower the price.

2. Conditions expected at end of project:

a. Of the 10.2 million children who will have been infants and of pre-school age during the project period, about 35% can be classified as severely or moderately malnourished. Of these 3.6 million malnourished infants and children(12-60 months) about will be

moved from "severely" or "moderately" malnourished to at least "slightly" malnourished (76% of weight-for-age). Infants 6-12 months will be included regardless of nutritional status in an effort to prevent malnutrition.

b. Of the 12.1 million children who will have been enrolled in primary school during the project period, about 30% can be classified as "obviously malnourished" (Red zone in the weight chart). Of these 3.6 million children, about 254,000 or 14% will be moved out of the red zone.

c. Of the women who will have been mothers of malnourished children and/or pregnant or lactating during the project period, or % will have attended classes in Nutrition Education, Family Planning, home food production and Home management.

d. A permanent organization will have been staffed in the Government of the Philippines to produce a national nutrition plan and to evaluate development projects for their nutritional impact. The organization will be located in the appropriate government agency and members of its management committee will represent the key decision-making groups in the country.

e. Approximately 30% of the foods now distributed in TMCH and school feeding programs will be replaced by local foods or by imports. (non-FFP supported)

f. 100% of the imported wheat will be extended at an 8 percent level with locally produced flour such as cocc, banana, cassava, etc.

g. Study and implement five new interventions in the processing, distribution, or production aspects of the food system that will have an impact on the food intake of infants and young children.

h. Family planning motivators will be making presentations in at least 75% of all TMCH classes or will have access to 75% of the participating families.

Basic Assumption to Achieve Project Purpose

a. Donated food and the impact of the education program are sufficient to cause improved nutritional status in infants and pre-school children.

b. NUTRIBUN five days per week is sufficient to cause improved nutritional status in primary school age children.

c. Mothers will be motivated to attend nutrition classes and will be motivated to change behavior as a result of the program.

d. The Department of Education is capable to assuming administrative responsibility of the school lunch program without further training.

e. Secretaries of Agriculture, Education, Social Welfare and others will continue to have a strong interest in improving nutritional status. This interest will be sufficient to secure a staff for national nutrition planning and financing for pre-feasibility studies on nutrition projects.

f. Large-scale commercial production of a low-priced ready-to-cook infant food made from local products will be in place and in operation by the end of the project. Likewise large-scale production of a grain flour extender will be underway.

g. The GOP will make funds or staff available for at least partial payment of five pre-feasibility studies of interventions in the food system to affect nutritional status of the target group.

h. Family planning program managers will realize the usefulness of using the captive audiences of TMCH mothers for recruitment into family planning services. The Church will, at the least, not obstruct motivators in conducting these classes.

Project Outputs

Kind	Magnitude	Date
Infants and pre-school children gain sufficient weight to move them in "slightly" malnourished category	---1000 infants and children	?
Primary school children gain weight sufficient to move them out of "red" zone	54,000 primary school children	1977
Completion of lab work, taste panel testing for wheat flour extender		?
Commercial plant installed and in operation to manufacture wheat flour extender	production sufficient to extend 100% of wheat flour supply at 5%	EOP
Commercial operations under way to replace 50% of TMCH food with locally grown and/or processed foods	production of approximately 12,000,000 pounds of food (revise this figure if original PROP request still holds)	EOP
Complete feasibility studies on interventions to affect nutritional status	One One One One One	1/74 6/74 12/74 6/75 12/75
Produce improved national nutrition plan taking into account multisectoral approach	One	6/74
Integrate operational planning of Family Planning and TMCH sufficiently to insure family planning motivators active role in TMCH program		12/74

Basic Assumption for Achieving Project Outputs

The malnourished infant, pre-school and primary school age population will not be affected with more than ordinary disease problems.

GOP continues to import wheat in quantities similar to recent years. Larger quantities of imports will require some reduction in achievement of output.

Ingredients for wheat flour extender and infant food continue to be available at current or less than current prices.

VolAgs will continue in their commitment to the design of the TMCH program.

Commercial food manufacturers will produce and market wheat flour extender and infant food.

Project Inputs

A. U.S. Inputs

1. Technical Assistance
   Direct Hire
   Contract
   Participants
   Commodities
2. Title II PL 480 Commodities

IV. Course of Action

1. Implementation Plan

a. Expand the current TMCH program from _____(in July 1973) to _____ by December 1973 and to _____ by June 1977. This will enable the program to reach the target group of ____,000 infant children, and mothers (Major action agencies are US VolAgs, and Philippine counterparts, Department of Social Welfare, and Department of Health).

b. Expand the current school feeding program for primary school children by establishing NUTRIBUN in _____ schools not now covered. This will bring the number of schools to _____. (Major action agencies are US VolAgs and their counterparts along with the Department of Education).

c. Turn over to Department of Education all administrative responsibility to operation and management of the school feeding programs. (Major action agency is Department of Education).

d. Encourage production of foods in home and school gardens to supplement the TMCH and school feeding program. Emphasis will be placed on crops for which there is a ready and lucrative market or that provide nutrients in scarce supply, especially calories and proteins (Major action agencies are US VolAgs and NFAC).

e. Commercial-scale production of wheat flour extender and of locally based infant food will be achieved by the end of the project period. At the time of the PROP submission, batch processing of one wheat extender and CSM extender is underway. This will allow commercial testing of flour and the CSM extender. Judgements about the commercial feasibility of production will be made after additional studies are undertaken. (Major action agencies are USAID providing some financing of technical assistance and NFAC, the GOP Nutrition Planning Agency).

f. Investigation of Further Nutrition Interventions

This project provides funds for contract services to conduct pre-feasibility studies in support of the National Food and Agriculture Council (NFAC). The scope of work for each study

will be agreed to by NFAC and USAID, as will other elements of support to be furnished by each. For example, USAID expects to provide contract U.S. professional services to conduct the feasibility studies, with NFAC providing counterpart Philippine professionals and supporting studies. The five interventions so far identified were selected from a much larger group on the basis of potential nutritional impact, the availability of an established technology, reasonable evidence of economic and administrative feasibility and apparent prospects for a short term but lasting payoff. However, there is no certainty that any one of these interventions will ultimately prove effective, nor that others which arise during the term of the subproject may not prove more desirable. The USAID therefore, wishes to treat this list as illustrative rather than definitive. Using this list as a guide, approximately $35,000 would be required over the first year for pre-feasibility studies.

- Improved Efficiency of Rice Milling
- Health Improvement
- Development of Weaning Food
- Coconut Flour Extender
- Vitamin Supplementation

These are rough order of magnitude estimates. By using a two-phase pre-feasibility/feasibility procedure, costs of unattractive interventions can be stopped early, yielding a balance for reinforcing the most promising efforts or supporting additional studies.

A two stage approach will be developed for each study:
Stage I - Prefeasibility

The primary purpose of this stage is to determine the existence of any overriding problems which must be resolved before implementation could be successful. In essence, it consists of gathering relevent existing information on the technical process (including operating ratios, costs and

yields), the administrative legal structure in which the process would operate, the characteristics of the target groups, and market characteristics, including prices. This information is analyzed to develop any critical issues which must be resolved if the interventions is to be judged feasible. At this point, a joint review by NFAC and USAID of the probability of resolving each issue should result in a go-no go decision to enter Stage II.

Stage II - Feasibility

The feasibility study is specifically directed at obtaining data which can satisfactorily resolve each of the issues identified in the prefeasibility study or confirm their intractability and the resulting impact on feasibility. The feasibility study also yields a set of socio-economic cost benefit analysis and an implementation plan.

g. Develop a stronger nutrition planning capability in NFAC through supplying technical assistance in planning and coordination and by providing some funds so that NFAC can broaden its responsibility to include pre-feasibility studies of nutrition interventions. (Major action agencies are USAID and NFAC).

h. Family planning and nutrition programs will achieve greater collaboration during the project period. A public health nutritionist has been hired to assist USAID to develop educational materials for motivators to use in the TMCH classes and in public schools. (Major action agencies are USAID, VolAgs, Department of Health and POPCOM).

2. NARRATIVE STATEMENT*

This project has several major activities, two of which are specifically directed at moving the supplementary feeding programs to further utilization of local resources. We have also included activities which address broader issues in the nutrition system of the Philippines. These activities are:

. supplementary feeding of approximately 400,000 - 500,000 malnourished infants, preschool children, pregnant and lactating women.

. supplementary feeding of about 1.3 million malnourished primary school children.

. integration of Targeted Maternal Child Health programs with some aspects of the Family Planning project.

. development and testing of locally based substitutes and/or extenders of CSM, i.e., a local weaning food.

. support and collaboration with GOP, particularly National Food and Agricultural Council (NFAC) of the Department of Agriculture, in the preparation of six pre-feasibility and feasibility studies investigating interventions in the nutrition system.

. provision of technical assistance to NFAC, the body charged with national nutrition planning, to strengthen its capabilities in planning and in project coordination.

a. Supplementary Feeding Programs

(1) Management - The preschool child program is administered by CRS, CWS and SAWS with operational support and assistance from the Bureau of Health Services (National Nutrition Program - NNP), Department of Health and Department of Social Welfare. The primary school NUTRIBUN program is administered by CARE and Catholic Relief Services with support provided by the Department of Education. USAID will offer assistance in coordinating these programs to insure sound management and achievement of targets.

Both programs are national in scope, presenting formidable management and logistic problems. During the past____years of operation of the NUTRIBUN program, we have overcome a number of important issues. For

* This "Narrative Statement" illustrates how USAID/P might improve the presentation and clarity of the description of their programs. It is not intended to be complete.

example, contracting with local bakers for preparation and distribution of the NUTRIBUN has been difficult and time consuming. The TMCH program has been going through a period of rapid expansion, growing from _____ centers in 1972 to 1,189 centers in May 1973. The organization of centers is conducted under the supervision of nutritionists/dietitians from CWS and CRS. Appendices A and B explain the general procedure used to organize a center in a barrio.

From our experience, one nutritionist/man/month is sufficient to enroll about 200 recipients and train local volunteers. After organization, one nutritionist can manage about _____centers, serving_____ mothers and _____ children. This management includes supervision of weighing and conduct of nutrition and home management classes.

There are now _____nutritionists working full-time on the program. They are supervised and supported in the following manner.

TABLE 10

Nutritionists in the TMCH Program

Source of Support	Number of Nutritionists
Catholic Relief Services	
Local Parishes	
Church World Service	
Department of Health	

(RELATE SIMILAR MANAGEMENT RELATIONS FOR SCHOOL PROGRAM)

(2) Targeting - The preschool and primary school programs are targeted at malnourished children. This change has been difficult and expensive, but it is now 95% complete. Evaluation of program participants' weight gain demonstrates the efficacy of supplementary feeding of infants, preschoolers and primary school children. These studies are summarized in Appendix____. (This is a new appendix---an important one if you are to make a convincing case.) Research of independent evaluators and our own staff provides ample evidence that supplementary feedings accompanied by regular weighing and classes in nutrition, home management and home gardening is an effective method of bringing underweight children up to boundaries of near normal weight for age.

In Appendices ___, ____, and____, we have provided a description of the weighing process and of the recording forms used in the centers and by program administrators.

(3) Reporting - An internal reporting system for TMCH has been devised through the collaboration of the VolAgs, GOP agencies, and USAID staff that provides constant feedback to field nutritionists and mothers of enrolled children, and sufficient information to national managers to maintain control of nutritional and logistical aspects of the program.

In the field, nutritionists record children's weight upon enrollment on a weight-for-age chart then plotting an expected growth curve to meet program targets. At monthly intervals thereafter, as long as a child is enrolled, weights are also recorded. This chart is explained to the mothers and they are motivated by the nutritionists to achieve monthly targets.

Centers report to the central administration monthly on weights of children, number enrolled, commodities distributed, and activities of the center. While data on food delivered monthly is tabulated regularly and is used in conjunction with warehouse reports for controls, weighing records are used to check randomly and on an irregular basis the impact of the program. These records have been the basis of several impact evaluations.

(DESCRIBE REPORTING FOR SCHOOL NUTRIBUN)

(4) Evaluation - Evaluation of the programs' nutritional impact has been conducted by independent contractors and by USAID/VolAg staff. Studies are summarized in Appendix____.

(5) Program Content

(a) Feeding Ration

Two different rations are proposed for TMCH. Catholic Relief Services has been distributing six pounds CSM and two pounds rolled oats; this will be changed to four pounds CSM and four pounds rolled oats. According to current prices, this will permit about 5% more rations without sacrificing nutritional benefits. Church World Service, serving a smaller number of children, provides four pounds CSM, two pounds rolled oats,

two pounds bulgur wheat. Table ____ compares nutritional values and current costs.

TABLE 11

	CSM	Rolled Oats	Bulgur	Cost/Ration
Catholic Relief				
Current	6	2	0	
Proposed	4	4	0	
CWS				
Current	4	2	2	
Proposed				

(b) Feeding Schedule - Enrolled children are given one ration per month; enrolled mothers, likewise. We discourage center managers from enrolling more than three individuals per family at any one time. Severely malnourished children receive the ration for 24 months, moderately malnourished children for 18 months; infants 6-12 months are enrolled and receive a ration for 12 months, even if not malnourished; and women receive a ration throughout pregnancy and lactation.

(c) Education and Motivation in TMCH - We conceive of the food ration as an attractant to bring mothers and children into regular contact with the feeding center. Following enrollment, mothers are given a series of classes in nutrition education, home management, preparation of the rations, and home and community gardening. Classes are monthly, lasting at least six months after enrollment. An evaluation of the Catholic Relief Services program was recently completed by the Asia Social Institute. As of this writing, only incomplete and inconclusive results of this study are available.

Home production of foods may provide supplemental income and added nutrients for some families. Under the sponsorship of Mrs. Marcos, the "Green Revolution" exhorted the entire population for the past two summers

to plant backyards and vacant lots with vegetables, root crops, fruits and corn. In national terms, this program is viewed as a response to a national food shortage until the rice crop is in; however, we conceive of home gardening as a permanent method of supplementing the diet of the low income.

We have not yet conducted any evaluation of this program, but intend to do so within the next 18 months.

(d) Commodities - Supplies requested (TO BE COMPLETED BY USAID).

(6) Government of the Philippines and Private Sector Participation:

- details of cooperation of Department of Education, Health & Social Welfare
- NNP evolution
- new development with Home Management Technicians.