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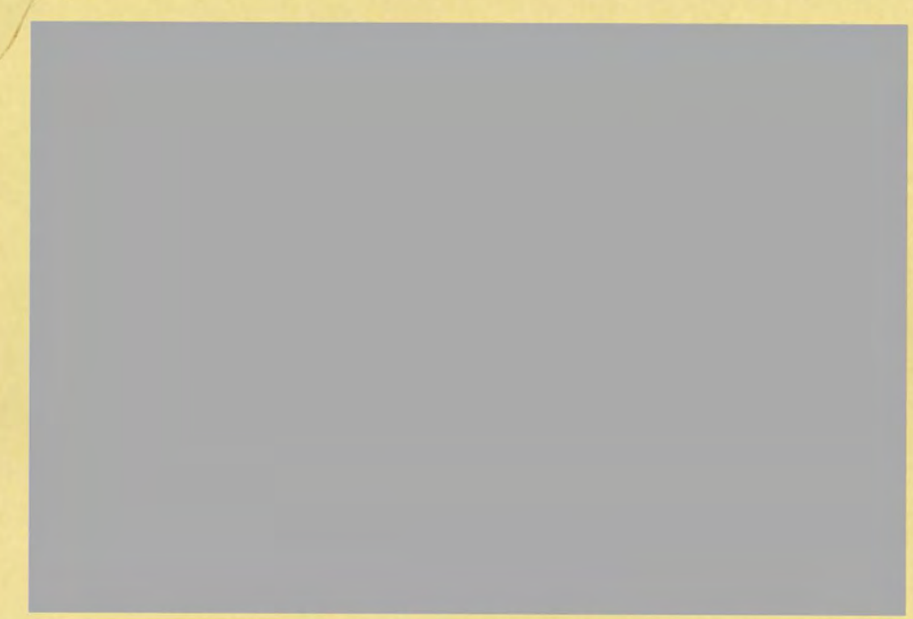

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INDONESIA

BASIC ECONOMIC REPORT

Changing Emphasis in Transmigration

Introduction /1

1. The Indonesian Government is firmly committed to transmigration as one of the means to generate rural development and improve rural income [distribution]. In general, transmigration refers to the movement of people from the more populated to the less populated and developed areas of Indonesia to improve their welfare. This includes the organized and spontaneous movement of people from the Inner Islands (Java, Madura and Bali) to settle undeveloped land in the Other Islands (mainly Sumatra, Kalimantan and Sulawesi); the movement of contracted labor to the Other Islands for rubber and palm oil estates and logging operations, [and the movement of educated and skilled Indonesians to work in the commercial and government sectors in Java. Transmigration can also refer to urban migration to the large population centers such as Jakarta.] However, this Annex is mainly concerned with the first group, people who move with Government assistance or spontaneously to new land developments in the Other Islands.

2. The Dutch commenced the first transmigration program, or agricultural settlements, in 1905. They were started in response to overpopulation and falling welfare in some districts of Java. The program was continued in a small and sporadic manner until the early 1930s. The peak number of people moved in any one year was just over 5,000 and the average for the period 1905-1931 was about 1,000 persons per year (total people moved was 27,000). The economic depression of the early 1930s severely reduced employment opportunities in Java and caused much poverty in the highly congested areas. The Government then decided to transmigrate people on a larger scale. From 1932

1/ This and the following section draw on information presented in Report No. 1503-IND, Identification of Transmigration Projects II, III and IV, Annex 2; and Report No. 183-IND, Agricultural Sector Survey Indonesia, Annex 3. The first reference describes in detail the history and problems in Transmigration.

until World War II stopped the program in 1942, the Government assisted 248,000 people to migrate to settlements in Sumatra, Kalimantan and Sulawesi. Following Independence in 1950, the Government resumed its transmigration program, and from then until 1977 has assisted some 810,000 people to move. The largest number of people moved in any one year was some 100,000 in 1973, and the average for the period 1950-77 was about 29,000 persons per year. The program has operated at a considerably increased tempo over the last two years, with 70,000 persons transmigrated in FY76-77, and 60,000 persons in FY77-78. The total number of assisted transmigrants from 1905-1977 is about 1.1 million. Assuming they comprise 35% of all transmigrants assisted and spontaneous, then over the same period spontaneous or unassisted transmigrants would total about 2.0 million. 3?

3. The Government agency responsible for assisting transmigrants is the Directorate General of Transmigration (DGT) within the Ministry of Transmigration and Cooperatives. The DGT, assisted by several other Government agencies, is responsible for establishing and initially managing transmigrant development areas in the Other Islands. It is directly responsible for the recruiting, selecting and moving of transmigrants from their present villages and towns to the new settlements. In the new settlement's early years, it also assists the transmigrants with grants of food, seed and equipment. The other main Government agencies involved in establishing the transmigrant settlements are the Directorate General of Highways (DGH), Directorate General of Agrarian Affairs (Agraria), Directorate General of Foodcrops Agriculture (DGFA), the Ministry of Health (MOH), the Ministry of Education and Culture (MEC) and the Ministry of Home Affairs (MHA). The Annex will later discuss in greater detail the role of some of these agencies.

Transmigration's Role in the Economy

4. The primary objective of transmigration up to the mid-1960s was to reduce overpopulation in Java. With some 88 million people living on about 13.8 million ha in the Inner Islands and rural populations in excess of 1,500/km^2 in the more fertile areas, intense pressure has developed on land resources.

with the resulting erosion, silting of rivers and irrigation canals, and increased flooding of lowlands. While most of the best land in Indonesia is concentrated in the Inner Islands, the Other Islands contain large tracts of unused land, and the Government considered these could be settled through transmigration / to reduce population pressures of the Inner Islands. For several reasons the transmigration program has never developed on a large enough scale to have any significant effects on Java's population growth problems. The enormity of that problem now can be grasped when it is realized that Java's annual population growth exceeds 1.5 million per year, and over the last 70 years perhaps three million people have moved. For the following reasons, transmigration has not developed to the extent needed:

a) most of the more productive and reasonably accessible Indonesian soils are already settled and cultivated. Population densities throughout Indonesia generally reflect resource availability at those sites /1. Lightly populated or unused soils, which could be developed, would require a higher level of management and inputs to obtain the same production as from the more productive soils, and/or require considerable capital expenditure to bring into production (such as clearing primary and secondary forest);

b) large areas do exist which are suitable for rubber (red-yellow podzolic soils and associated complexes). However, rubber establishment is too expensive (US$5,700/family) and slow-maturing around which to build a large transmigration program. These soils can also be used for food crops, however, this use has only recently been investigated in detail and the required production techniques developed.

1/ Supply Prospects for Food Crops, Indonesia; Projects Department, East Asia and Pacific Regional Office, IBRD, April 1978, Annex 3, page 2 "...although the population is very unevenly distributed, the productivity of the soils of Java and the intensity with which they are farmed is such that the distribution of food crop production between Java and the Other Islands almost matches that of human population."

c) settlement areas have been poorly planned and the transmigrants unsufficiently assisted. Soil and topographic surveys and mapping were either not done or inadequately performed. The area of land given each settler, in some instances (one ha), was too small. Infrastructure such as roads, irrigation facilities, schools and health services were too slow in coming, or not provided at all. Most settlements were based on irrigated land, however, some are still waiting 30-40 years later for the irrigation facilities. Settlers were not supplied with the necessary agricultural inputs such as extension, seed, fertilizers and pesticides, and credit schemes, where provided, were often mismanaged;

d) the poor selection of settlers, who were often sick, infirmed, aged or undesirables; and

e) poor coordination between the Government agencies involved in transmigration, insufficient skilled and capable personnel within these agencies to plan and implement the proposed transmigration schemes; and corrupt and inefficient administration of the schemes.

5. The Government now sees transmigration mainly as a means of developing the resources of the Other Islands and only secondarily as a means to alleviate poverty and population pressure in parts of Java /1. In the second Five-Year-Plan (Repelita II, 1974/75 - 1978/79) transmigration was seen as:

a) being integrated with regional development activities in the Other Islands and providing manpower in areas short of labor;

b) increasing food gain production, providing rural employment opportunities and improving rural income distribution; and

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/1 Report No. 1503-IND, op cit.

c) improving the national integration of the population, and populating strategic border areas.

6. Poor planning and uncoordinated implementation still constrain the Government's transmigration program. The DGT is weak and not operationally oriented. Until recently, the Provincial Authorities selected areas for transmigration without adequate physical data (such as soil surveys and the appropriate topographic mapping) to allow selection of the most suitable areas, or to correctly design development within the proposed areas. To combat these problems, early in 1978 the Government created a Land Settlement Unit (PTPT) within DGH to select future development areas, and designated DGH to construct all the necessary infrastructure such as roads, houses, water supplies and warehouses. As DGH has proved itself capable of implementing projects under the Bank-assisted highway program, and has sufficient capable, trained staff to man this new unit and carry this additional workload, this change of responsibilities and should considerably assist in the future selection and implementation of transmigration projects. The Bank, in its present and proposed transmigration projects, is exploring with the Government further improvements in planning and implementation of transmigration from the national to the on-site level. Additionally, if transmigration is to play a role in regional development, more suitable regional studies are required to identify development areas and suitable land development patterns. Potential development areas near existing population centers should be developed first to take advantage of the existing scarce management and infrastructure services (markets, roads, health centers). Similarly, developments should not be too small or scattered, causing diseconomies in these services. Development should also include the local people so as not to form pockets of high income or mini Javas or Balis ~~amongst the indigenous people.~~ in their midst.

7. If transmigration is to be successful in developing the resources of the Other Islands, it must be able to compete with investment opportunities elsewhere in Indonesia. Providing the planning and implementation problems can be overcome, the technology and production techniques are available to develop projects with 15% to 20% economic rates of return. These rates of return are competitive with those for other land development projects in Indonesia, such as developing rainfed land to irrigated land, or providing water storage for dry season irrigation in an already irrigated area. Nevertheless, although considerable potential exists for viable land development in the Other Islands, Government intervention will be necessary to initiate this development. Only the Government can make the necessary land and soil surveys to demarcate potential development sites. Most of the potential transmigrants do not have the knowledge or capital to successfully clear primary forest. Additionally the Government must construct access roads, instruct farmers in production techniques for the red-yellow podzolic soils, and ensure agricultural inputs (such as credit and fertilizer) are initially available. Many of the poorer potential transmigrants will also require financial assistance to move to the transmigration areas.

Potential for Transmigration

8. This section is based largely on information contained in the report of the recent Bank mission (November, 1977) which examined the supply prospects for food crops in Indonesia /1. The section looks at the availability of suitable areas for the development of food crop production. However, as the soil survey data available are inadequate for detailed estimates of land potential on a national scale, any results presented are approximations.

9. In the Other Islands, the main soil types available for development are the organosols or peat soils (total area some 24 million ha), and the red-yellow podzolics (47 million ha) and their associated complexes with other soils (54 million ha). Organosols are mainly located along eastern Sumatra in Kalimantan and Irian Jaya. Red-yellow podzolics and their associated complexes are mainly found in Sumatra, Kalimantan, Irian Jaya and Sulawesi. The most promising organosols for development are the tidal swamp lands, a portion of which, with substantial inputs into the control of drainage, can be cleared and developed for rice cropping. These soils are already being settled spontaneously and are the target for current and projected irrigation developments /2. An estimated 2.2 million ha of them are suitable for development /3.

10. The red-yellow podzolics and their associated complexes, the most extensive soil type in the Other Islands (comprising 57% of the total area), are easily erodable when cleared; tend to be strongly acidic, normally varying in pH from 4.2 to 6; and are low in organic matter content and plant nutrients, particularly levels of available phosphorus and nitrogen. In the past when

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1/ Supply Prospects for Food Crops, Projects Department, East Asia and Pacific Regional Office, IBRD, April 1978.

2/ Irrigation Program Review, Projects Department, East Asia and Pacific Regional Office, IBRD, January 1978.

3/ Rumawas, F. (1973). The use of tidal areas in Indonesia for agricultural land. Institut Pertanian Bogor.

cleared, many areas of red-yellow podzolics were cropped under shifting cultivation systems with long rest periods, which permitted the re-establishment of forest and the restoration of nutrient levels. If the areas were cropped too intensively before resting, the forest cover does not re-establish but is replaced by a tall, coarse grass cover of Imperata cylindrica (alang-alang) at a lower soil nutrient level. Since settlers used little or no fertilizers, and did not control erosion, early attempts were unsuccessful in continuously cropping these soils under natural rainfall. However, production techniques have now been developed to allow continuous cropping under upland conditions. These are based on proper clearing, erosion control structures, contour ploughing, adequate fertilizer and sequential cropping. Cropping patterns and yields are further discussed in para 21. These soils are also quite suitable for rubber production, and for many years it has been grown successfully on them.

11. Whatever the soil type involved, the slope strongly influences the development capability of new areas for upland cropping. Throughout Indonesia, five general slope classes of agriculture significance are recognized:

a) swamp: a general term for all land liable to inundation where the primary requirement for development is drainage control;

b) 0-3% slope: land, soil and climate permitting, capable of being safely developed for annual cropping with little or no modification to surface geometry;

c) 3-8% slope: land capable of being safely developed for annual cropping provided surface geometry is modified by terracing, contouring and other structures to control surface water flow and associated soil loss;

d) 8-15% slope: land unsuitable for annual cropping but which may be safely developed for perennial tree crops; and

e) >15% slope: land unsuitable for agricultural development.

Slope will, of course, intereact with soil type in that, at a given slope, some soils are more prone to surface water movement than others owing to differences in permeability, and/or are more liable to erosion because of differences in stability of the soil surface.

12. Table 1 shows by slope class the total area, and the unalienated area area that could be used for annual cropping in Sumatra, Kalimantan, Sulawesi and Irian Jaya. Out of a total area of 162 million ha (85% of Indonesia's total area) only some 10% is in the 0-3% slope class and 7% in the 3-8% slope class; and of the unalienated land only some 8% and 6% respectively. Thus, by this estimate, around 85% of the upland area of the Other Islands is unsuitable for annual cropping development on the basis of slope and alienation alone, without reference to soil type. Of the 22.7 million ha of unalienated land that is suitable (with slopes of 0-3% and 3-8%), 41% is in Sumatra, 34% in Kalimantan, 3% in Sulawesi and 22% in Irian Jaya.

13. To take account of other factors relevant to development, an FAO/UNDP report /1 looked at land capability in terms of Land Development Units, which are composed of areas of land "essentially similar or comparable in respect to physiography, relief, climate, soils and water resources." These units were classified according to their potential utilization, such as for irrigated rice, rainfed upland crops, estate tree crops and so on. Table 2 shows by province, firstly the total land areas; then according to the FAO/UNDP study, the land suitable for annual crops, the land suitable for upland crops, the land suitable for irrigated or rainfed rice production on bunded areas (sawah), the total land in existing smallholder agricultural holding (Central Bureau of Statistics figure) and the unalienated land suitable for annual cropping /2.

1/ FAO/UNDP (1974). Indonesia. A Land Capability Appraisal. Interim Report. Rome.
2/ Table 2 is derived from data in the Bank Report - Supply Prospects for Food Crops Indonesia, April 1978, which states "...since the FAO/UNDP survey is only a compilation and ordering of existing exiguous data, it must be regarded only as a first approximation."

14. The figures in Table 2 of land suitable for upland cropping and land suitable for sawah rice include double-counted areas of unknown magnitude suitable for both upland crops and sawah rice. Thus the sum of them is greater than the total land suitable for annual crops (33.2 million ha). Since land development in Java, Bali and Nusatenggara has extended into land classed as unsuitable for cropping, the total area of land in smallholder agricultural holdings plus unalienated suitable land for annual cropping (35.1 million ha) is also greater than that listed as suitable for annual cropping.

15. As presented in Table 2, although highly approximate, the total unalienated land in Indonesia, suitable for cropping either to sawah rice or upland crops or both, is 18.9 million ha, slightly greater than the 16.2 million ha currently in agricultural holdings. Thus the potential for area expansion of food cropping is large, and of the 18.9 million ha, 46% is in Sumatra, 16% in Kalimantan, 7% in Sulawesi and 33% in Maluku and Irian Jaya.

Bank's Involvement in Transmigration

16. So far the Bank has only assisted in financing one transmigration project, Transmigration I (Loan 1318-IND) /1. However, the Bank has been indirectly involved in helping transmigration earlier through its assistance for the Trans-Sumatra Highway (Loan 260-IND) which has opened up large areas of Sumatra, and the regional studies of the highway's area of influence in the provinces of West Sumatra, Jambi, South Sumatra, Bengkulu and Lampung. The Government wanted these studies to assist it with its regional development planning, and to enable it to combine the transmigration program into the overall regional development of the Other Islands. The studies were completed in 1977. Other Bank projects which have components directly or indirectly assisting transmigration are the Resource Survey and Mapping Project (Loan 1197-IND); the Nucleus Estates and Smallholders I Project (Loan 1449-IND) which settled 2,000 odd landless families from Sumatra; Irrigation IX (Loan 1435-IND), which provided the first stage irrigation facilities for farmers being re-settled from the Wonogiri reservoir site; and the three estate projects in Sumatra (Credits 155, 194 and 319-IND), which would provide employment opportunities for local or transmigrant labor.

17. Because of the large transmigration target (initially 250,000 families, later reduced to 100,000 families) set under the Second Five Year Plan, the Government invited the Bank, FAO and some bilateral agencies to assist with the program. Most of the earlier transmigration projects were based on irrigated or rainfed sawah rice production. As stated, however, too often the irrigation facilities were never built and the settlers either left the site or subsisted at a level of poverty similar to what they had left in Java. To make transmigration more attractive and to reduce the cost of required infrastructure per family, the Government also decided to offer new settlers five ha of upland rather than one or two

/1 Full name of this Project is "A Transmigration and Rural Development Project, Indonesia." It has generally been shortened to Transmigration I.

ha of irrigated land. Land selection criteria were to be revised to set aside suitable land which was also accessible rather than isolated areas which local residents did not want. An area 15 km on each side of the Trans-Sumatra Highway was set aside for settlement and a bilateral agency (British Overseas Development Ministry) was asked to study the area in detail, and select and plan future transmigration projects.

18. Transmigration I is mainly an experimental project to help the Government overcome constraints in the organization, implementation and management of its transmigration program, and develop a low-cost per family program for upland areas which would allow a large number of assisted and spontaneous transmigrants to move annually. The Project is at two sites in South Sumatra province, one settlement of 4,500 families, the other an upgrading of an existing settlement of 12,000 families. The project was settlements are largely based on rubber (one ha/family) and supplemented by foodcrops (1/2 ha/family). The Project cost is US$5,000/family.

19. Experience with the Project so far suggests that the implementing agencies are still not coordinating sufficiently. Lines of command from on-site to the central Government level are not adequately delineated, and much stronger and efficient on-site management is required. While the Project was formulated with rubber planting and production as the settler's main enterprise, the settlers instead have devoted most of their energy and activity to food cropping. Project formulation assumed that cash income from rubber would be necessary to move settlers past subsistence levels. This assumption is already being challenged by the incomes from food cropping at both sites.

Future Bank Involvement in Transmigration

20. In 1977 the Government decided to accelerate transmigration to move 100,000 families per year during the third Five Year Plan (FY79/80-FY83/84). To

move from past levels of 10,000 to 100,000 families per year, the Government is endeavoring to reduce its role to providing only the minimum facilities and services essential for success. This will mean considerable reliance on the initiative and hard work of the settlers themselves as well as delegation of major management responsibilities to the provincial and local level. However, a completely laissez-faire approach could result in severe damage to the ecology and consequently give settlers very little assurance of a secure future.

21. Future Bank-assisted projects will be based mainly on a combination of food crops and home gardens. Being the cheapest development program (about US$3,500) per family, it will allow the maximum number of families to be moved. If settlers are given properly clean-cleared land and the necessary agricultural inputs they can quickly start cash cropping and earning substantial financial returns beginning with the first crop. Additionally, Javanese settlers are used to food cropping and can quickly adapt to producing them under Sumatran or other conditions. The Japanese-aided project in Lampung province (Tani Makmur Project) has demonstrated that farmers can grow viable annual food crops on the red-yellow podzolic group of soils. Over the last four years farmer yields have averaged 2.2 ton/ha (paddy) of upland rice; 1.2 ton/ha (grain) corn; and 15.2 ton/ha (wet tuber) cassava. At these or slightly lower yields farmers should be able to earn incomes of US$150 per capita from areas of about 2.0 ha of foodcrops and mixed gardens per family. This income would be considerably in excess of the present incomes that prospective transmigrants are earning.

22. Future Bank-assisted projects will concentrate on the following major items considered essential for project success:

a) adequate soil and topographic surveys and mapping, to ensure the choice of the best available areas for transmigration. The Bank already has initiated "computer mapping" for transmigration areas. Under this, all viable survey and mapping data for an area are put on tape, and then the computer can produce maps with various combinations of overlays, and at different scales;

b) proper clean-clearing of proposed food crop areas, and undertaking erosion control measures and structures. Where possible the areas will be logged for millable timber;

c) extension services on food crop production and adaptive research on fertilizer use in farmer's fields;

d) adequate good seed, fruit stock, fertilizer, pesticide and credit supplies. Fertilizer will be supplied free to farmers for the first five years;

e) construction of minimum-cost access roads, fertilizer godowns, marketing facilities and ensuring potable water supplies and health services;

f) assistance to local farmers to ensure they share in the benefits of development, and the encouragement of spontaneous transmigrants to the site; and

g) strong on-site management and coordination of the implementing agencies.

23. The Bank is currently appraising Transmigration II. This project proposes to develop, over three years, six areas along the Trans-Sumatra Highway and one site in South Sumatra Province with a gross area of some 342,000 ha to

accommodate 36,000 new settler families and upgrade 10,000 existing families. Each family will be given 2.0 ha of cleared land for food cropping and garden. Three future projects have already been tentatively identified. They are located at sites in Sumatra, Kalimantan and Sulawesi and would involve moving some 351,000 families, costing US$1,228.6 million as shown in Table 3.

24. Transmigration II was prepared by the PTPT which also identified the three proposed future projects. Transmigration I and II provide funds to assist the Government develop project preparation capabilities and the Bank will continue to work to ensure strong Government expertise in this field. However, as it is still not clear to the Bank whether the Government intends to use the PTPT or the DGT for project preparation, the Government must clarify its own views on this point.

ANNEX
Table 1

INDONESIA

BASIC ECONOMIC REPORT

Land in Other Islands Classified by Slope

Region	Slope Class					
	Swamp	0-3%	3-8%	8-15%	>15%	Total
	('000 ha)					
1. Total Area						
Sumatra	13,211	8,491	4,102	1,844	19,712	47,360
Kalimantan	12,764	3,693	4,779	3,308	29,402	53,946
Sulawesi	469	955	806	927	15,747	18,904
Irian Jaya	12,980	3,606	1,288	844	23,477	42,195
Total	39,424	16,745	10,975	6,923	88,338	162,405
2. Unalienated Land /a						
Sumatra	-	6,037	3,314	1,458	-	10,809
Kalimantan	-	3,143	4,649	3,180	-	10,972
Sulawesi	-	333	371	623	-	1,327
Irian Jaya	-	3,606	1,288	844	-	5,738
Total	-	13,119	9,622	6,105	-	28,846

Source: Muljadi, D. (1977). Sumberdaya tanah kering, penyebarau dan potensinya utak kemungkinan budidya pertanian. Kongres Agronomi, Bogor.

a/ Unalienated swamp and >15% slope land are not shown. The total column here refers only to land of 0-3%, 3-8% and 8-15% slope.

ANNEX
Table 2

INDONESIA

BASIC ECONOMIC REPORT

Agricultural Land Potential

Province	Total land area	Land suitable for crops a/	Land suitable for upland crops b/	Land suitable for sawah rice b/	Land in agricultural holdings c/	Unalienated suitable crop land
	('000)					
DKI Jakarta	59	14	-	14	18	-
West Java	4,630	1,711	1,140	1,290	1,900	-
Central Java	3,421	1,376	885	1,070	1,961	-
DI Yogyakarta	317	165	140	95	242	-
East Java	4,792	1,647	1,260	1,080	2,185	-
Total Java and Madura	13,219	4,913	3,425	3,549	6,315	-
DI Aceh	5,539	489	420	275	431	58
North Sumatra	7,079	1,074	1,074	425	933	141
West Sumatra	4,978	1,042	870	610	381	661
Riau	9,456	2,073	2,000	485	606	1,467
Jambi	4,492	2,260	2,120	1,090	553	1,707
South Sumatra	10,369	3,182	2,315	2,705	1,036	2,146
Bengkulu	2,117	563	360	440	165	398
Lampung	3,331	2,693	1,965	1,860	639	2,054
Total Sumatra	47,361	13,376	11,124	7,390	4,744	8,632
West Kalimantan	14,678	1,240	-	1,240	1,001	239
Central Kalimantan	15,260	1,500	795	1,335	419	1,081
South Kalimantan	3,766	1,130	945	660	311	819
East Kalimantan	20,244	890	425	840	109	781
Total Kalimantan	53,948	4,760	2,165	4,075	1,840	2,920
North Sulawesi	1,902	285	180	225	477	-
Central Sulawesi	6,973	486	395	305	257	229
South Sulawesi	7,278	1,119	550	1,040	812	307
Southeast Sulawsi	2,769	707	700	305	143	564
Total Sulawesi	18,922	2,597	1,815	1,875	1,689	1,100
Maluku	7,450	342	122	340	260	82
Irian Jaya	42,918	6,242	3,865	5,001	100	6,142
Total Maluku and Irian Jaya	50,368	6,584	3,987	5,311	360	6,224
Bali	556	204	145	145	304	-
West Nusatenggara	2,018	306	275	160	334	-
East Nusatenggara	4,788	468	425	240	650	-
Total Bali and Nusatenggara	7,362	978	845	545	1,288	-
INDONESIA	191,180	33,208	23,361	22,745	16,236	18,876

Source: Supply Prospects for Food Crops, Project Department, East Asia and Pacific Regional Office, IBRD, April, 1978.

a/ This includes holdings less than 0.05 ha.
b/ Land that is suitable for either upland crops or sawah rice is counted twice within these two columns: see text.
c/ Where land in agricultural holdings is greater than land suitable for crops shows where farmers have developed cropping onto unsuitable land.

ANNEX
Table 3

INDONESIA

BASIC ECONOMIC REPORT

Future Transmigration Projects

Province	Number of Families			
	Trans. III	Trans. IV	Trans. V	Total
	('000)			
Riau	24.1	22.5	22.5	69.1
Jambi	12.1	11.3	11.3	34.7
Bengkulu	6.9	6.4	6.4	19.7
South Sumatra	32.8	30.6	30.6	94.0
Total Sumatra	75.9	70.8	70.8	217.5
West Kalimantan	24.1	22.5	22.5	69.1
South Kalimantan	8.6	8.1	8.1	24.8
Total Kalimantan	32.7	30.6	30.6	93.9
Central Sulawesi	13.8	12.9	12.9	39.6
Total Sulawesi	13.8	12.9	12.9	39.6
Total	122.4	114.3	114.3	351.0
Gross area ('000 ha)	275.5	257.2	257.2	789.9
Total cost (US$ million)	428.6	400.0	400.0	1,228.6

THE WORLD BANK

SYSTEMS FOR MONITORING AND EVALUATING NUTRITIONAL INTERVENTIONS

Prepared by: Guido J. Deboeck
August 1978

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FOREWORD

"What difference does it make?" This is the difficult question policy planners are now posing routinely to those responsible for nutrition programs. The nutrition landscape is littered with unmonitored and unevaluated projects. Much anecdotal reporting--but little hard evidence--is available about the usefulness of nutrition activities or how specifically to improve them.

The importance of this issue increases as nutrition programs, bolstered by growing awareness of malnutrition as a fundamental development problem, emerge to claim larger shares of scarce financial and managerial resources. Effective monitoring and evaluation systems become essential to ensure sound planning and implementation of such programs.

Brazil provides a case in point. In January 1977, the Government, recognizing the gravity of the problem, began a major nutrition initiative with collaboration from the World Bank. Willing to commit substantial resources (U.S.$1.3 billion over four years), the Government faced two choices in deciding how to proceed. It could study the problem for several years or it could move ahead with a large operational program, recognizing that limited data availability and lack of precedent might make the initial effort less cost-effective than ultimately possible. The Government opted for a two-track approach: one that implemented on an operational scale several alternative delivery systems designed to reach people with better nutrition (through the commercial marketplace with consumer subsidy, health services, education facilities, and the extension service) while simultaneously conducting a series of studies to determine the relative effectiveness of these activities. Monitoring and evaluation efforts started at the project design stage under the direction of Brazil's National Institute of Food and Nutrition (INAN). Dr. Guido Deboeck, the author of this report, participated as the World Bank staff person in these activities.

As an integral and continuous part of the management system of the Brazil nutrition project, the systems developed provide needed information on achievement of physical targets, costs and nutrition effectiveness. They also will provide the foundation for the future planning of the national nutrition program.

This may be the first such nutrition effort of its kind--at least of this scale. As time goes on, it will doubtless be demonstrated that the system described here is not without its problems. Several refinements already have been made, based on operational experience to date. We expect and would welcome others.

In a field where good operational information is a scarce resource, this effort, suitably modified for particular conditions, may be helpful to others confronted with the same kind of problems. Our hope is that it also

will contribute to the eventual practice of routinely including monitoring and evaluation as a specific activity in all nutrition programs.

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THE WORLD BANK

SYSTEMS FOR MONITORING AND EVALUATING NUTRITIONAL INTERVENTIONS

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SYSTEMS FOR MONITORING AND EVALUATING NUTRITIONAL INTERVENTIONS

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SUMMARY

A survey of nutrition programs around the world, conducted in 1976/77 by the Harvard Institute for International Development, revealed that out of 140 programs, only 23% reported that nutritional status data had been analyzed and only 15% had analyzed their program's cost data. Monitoring and evaluation of nutritional intervention programs have thus been largely insufficient and deficient.

Monitoring and evaluation are, however, important to good management which is critical to effective implementation. Effective implementation of nutritional programs is a prerequisite to bettering the nutritional well-being of people. Without information on the relative effectiveness of nutrition programs there is no solid basis upon which to allocate funds. In a make-believe world of unlimited abundance this would present no problem. However, the harsh reality is that resources are extremely scarce relative to the needs of millions of poor and malnourished people. Accordingly, it is imperative that funds be channeled so that their impact is maximized. Allocating resources without adequate evaluation information can be very costly, and planning blind is a luxury few countries can afford.

Many countries are beginning to recognize this. Some countries are undertaking major efforts to develop a national nutrition program with built-in monitoring and evaluation systems. The Government of Brazil was one of the first such countries. Increased government concern about malnutrition and greater awareness of the inadequacies, lack of focus, and coordination of existing programs, led in November 1972 to the establishment of a National Food and Nutrition Institute (INAN) under the Ministry of Health of Brazil. INAN was given responsibilities for planning, guiding, coordinating, monitoring and evaluating of a national nutritional program.

The overall approach of this program relies on the principle that improvement of nutritional conditions of a population depends largely on a reduction of the costs of producing and marketing basic foods and on better distribution of income. This program aims at meeting the most urgent needs of vulnerable groups through the development and execution of low-cost interventions, while laying the base for broader policies and program design for a more fundamental and longer-term impact on malnutrition in Brazil.

In order to start on such an effort the Government of Brazil needs to build the basic prerequisites, such as (i) sufficient knowledge of the nature and extent of malnutrition and more precise understanding of its causes; (ii) trained manpower and institutions capable of implementing large-scale nutrition programs; and (iii) knowledge concerning the effectiveness of alternate forms of delivering nutrition services, especially for nutritionally vulnerable pre-school children and, relatedly, to pregnant and lactating women.

For these reasons the Government of Brazil and the World Bank approved in June 1976 a Nutrition Research and Development Project, to be implemented from 1977 through 1980.

The primary purpose of the Nutrition Research and Development Project in Brazil is to counter malnutrition among pre-school age children, pregnant and lactating women of low-income families, in order to help launch the national nutrition effort on a sound basis. The project is oriented toward research and testing the cost-effectiveness of nutritional interventions through various delivery systems (e.g. rural extension services, health delivery systems, commercial markets, school infrastructure). The project is designed to provide the Government of Brazil with basic information, institutional and manpower capabilities and adequate quantitites of certain high-priority inexpensive food products, in order to permit the Government to more effectively plan and deploy resources of the National Food and Nutrition Program.

To measure the success of the Nutrition Research and Development Project in Brazil, information systems are used to keep track of the extent to which the goals, objectives and planned benefits are realized through project implementation. These include monitoring and evaluation systems primarily used as management tools to increase the efficiency and effectiveness of implementation.

This paper outlines the monitoring and evaluation systems that are used for the testing of the cost-effectiveness of nutritional interventions through various delivery systems in Brazil.

To efficiently monitor and evaluate nutritional interventions, it is important to have clearly stated objectives, quantified into targets. It is also important to realize that some ultimate goals of a project can only be achieved through intermediate objectives, and that these can themselves be achieved by successfully implementing a series of detailed implementation objectives regarding project inputs and activities. Thus, a "hierarchy of objectives" needs to be developed that shows the linkages between project inputs, activities, outputs, and the expected effects and impact of the project.

Monitoring is defined in this paper as the periodic collection of information on inputs, activities and outputs, and their comparison with the original plan for the purpose of warning the project management about potential implementation problems requiring corrective action. Applied to the Nutrition Research and Development Project, monitoring is mainly concerned with efficient implementation. Since the project is composed of several components, a distinction is made between the monitoring of components and overall monitoring.

Monitoring of the Nutrition Research and Development Project consists of an internal reporting system relying to a great extent on the information provided by component managers, complemented with field observations and frequent on-site contacts between project coordinator, project unit staff and the local responsible officers. In addition to this, regular working sessions are held between the project coordinator and the component managers. These meetings are used to discuss project progress and implementation problems. They also provide for on-the-job training through the exchange of experiences. Agencies involved in the project are invited to attend or contribute to part of these working sessions. In this way, the monitoring system not only provides an essential information base for efficient implementation, but also serves as a training ground for managers of nutritional intervention projects.

Evaluation is defined as an analysis of project effects and impact for the purpose of providing project planners and policy-makers information on the objectives, institutional arrangements and resources affecting the project. The major results from the evaluation of the Nutrition Project in Brazil would be better information for planning of nutritional intervention programs. This paper discusses two types of evaluation:

> Component-specific evaluation, that is an analysis of the cost-effectiveness of alternative models of intervention through different delivery systems. The outcome expected from component-specific evaluations would be a rank-ordering of nutritional intervention models, based on cost effectiveness measures for each type of intervention through a particular delivery system.
>
> Overall evaluation, that is an analysis of evaluation results from the various components, with a special emphasis on comparisons that can be made across components (e.g. by age group, urban/rural differences, etc.). The ultimate objective of overall evaluation of the project is to provide the Government of Brazil with information on the relative cost-effectiveness of nutritional interventions through various delivery systems.

Each of the evaluation systems described in this paper list the:

- purposes of evaluation;
- specific hypotheses to be tested;
- key indicators;
- survey and sample characteristics;
- questionnaires used;
- timing and organization of field data gathering;
- data tabulation, processing, analysis procedures; and
- reporting procedures for the evaluation results.

The monitoring and evaluation systems described in this paper resulted from an iterative process of trade-offs between resources, techniques and objectives. These trade-offs were originally discussed between the Project Coordinator of INAN, the managers of the project components, and the representatives of various local research institutes and universities in a workshop held in Brazilia in May 1977, a few months after the project became effective. Since then, they have been reviewed and adapted on several occasions on the basis of actual field experiences.

The monitoring and evaluation systems built in the Nutrition Research and Development Project in Brazil are integral, continuous parts of the management system of this project. They are essential for effective implementation and for the future planning of a national nutritional program.

SYSTEMS FOR MONITORING AND EVALUATING NUTRITIONAL INTERVENTIONS

I. MALNUTRITION IN BRAZIL

1.01 Many countries are beginning to recognize the importance of the malnutrition problem and its implications for national development. Some countries are undertaking major efforts to develop a national nutrition program as part of their development program.

1.02 The Government of Brazil was one of the first such countries. Increased government concern about malnutrition and greater awareness of the inadequacies, lack of focus and coordination of existing programs, led in November 1972 to the establishment of a National Food and Nutrition Institute (INAN) under the Ministry of Health of Brazil. INAN was given responsibilities for assisting the Government in formulating national nutrition policies and for preparing, supervising and coordinating a national nutrition program. Its official mandate was the National Food and Nutrition Program (PRONAN), promulgated in March 1973, and designed for an initial period through 1975. Based on this mandate, INAN's activities were to be directed to a target group consisting of children (pre-school and primary-school age) and pregnant and lactating women from low-income families. PRONAN stated that program execution will be undertaken by established agencies with INAN responsible for "planning, guidance, coordination, monitoring and evaluation."

1.03 In order to systematically plan, guide and coordinate nutritional programs information is required on nutritional status, food consumption patterns, family budget expenditures, cost-effective nutrition delivery systems, etc. In most developing countries data on these matters are meager, geographically spotty, of uneven quality, and/or outdated. Seldom is information available on the relationship between income growth, agriculture productivity and the nutritional status of the population.

1.04 The data base on malnutrition problems in Brazil is weak. Although some data on malnutrition problems is available, little of it has been structured or properly analyzed. From the existing data and some expert observations, a few broad statements can, however, be made about malnutrition in Brazil.

1.05 Although the daily per capita availability of food from 1960 to 1968 in Brazil was estimated at 2,900 calories and 63 grams of protein (more than 15% above recommended daily allowances), all indications are that more than half the population have caloric and protein deficiencies. The Getulios Vargas Foundation reported in 1961-62 that 61% of the urban and 63% of the rural population in the Northeast were deficient in calories and protein and that a significant portion of the population in other areas of Brazil also consumed less than the minimum requirements. A 1971 study by the Bank of the Northeast reported that the average daily intake of the urban population in the Northeast was 1,857 calories, 69% of the recommended allowance. Other studies indicate seriously low intake levels among landless laborers.

1.06 Malnutrition affects especially pre-school age children, reducing optimum physical and mental development and resistance to infectious diseases, and contributes to high infant mortality. The infant mortality rate in Brazil is about 75 per 1,000 and in the Northeast officially reported at 137 per 1,000. A study published by the Pan American Health Organization (PAHO) in 1973 reported that nutritional deficiency and immaturity 1/ were underlying or important associated causes of 60% of the infant mortality in Recife and an average of 39% in other Brazilian areas studied. Eight spot surveys in the Northeast show that about 51% to 85% of the children studied are suffering from malnutrition, with more than one-fifth falling below 70% of the normal body weight for their age. Even though no special studies have been undertaken in Brazil, it is reasonable to assume from studies elsewhere that the combined high degree of second- and third-degree malnutrition 2/ in the early childhood years is one of the causes of poor performance later in school and high rates of school absenteeism and dropout in Brazil.

1.07 Iron deficiency anemia and vitamin A deficiency are found in approximately 20-30% of the children in most of the places where observations have been made. Pregnant women are especially vulnerable to anemia. It causes a higher incidence of maternal deaths, still-births and premature births. Vitamin A deficiency affects growth, the severity of other nutritional infections and diseases. It is an important cause of blindness in low-income countries.

1.08 As in most countries, Brazilian agricultural policies in the past have seldom taken into account the nutritional needs of specific age and income segments of the population. Brazilian agriculture has grown at an average of approximately 6% over the last five years, with much of the increase attributed to the Government's drive to increase export crops such as soybeans. In some instances the emphasis on production of certain export crops has had the effect of displacing basic food crops for domestic consumption and such substitution may not have had, at least in the short term, a positive impact on the nutritional status of the poor.

1.09 Until recently government agricultural services concentrated attention on large and medium scale farms, emphasizing export and import substitution crops. Small farmers in the Northeast, for example, generally had limited, if any, access to agricultural credit and rural extension, although basic food crops constitute the main production of these farms. Similarly, funds for agricultural production research had not been deployed in a manner to increase crop production by small farm owners, sharecroppers and tenant farmers. The lack of on-farm storage facilities and access to larger storage facilities contributed to the need of the rural poor to sell products at low prices during harvest season and buy them back later at higher prices for family consumption. Moreover, basic social and institutional patterns including

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1/ Immaturity of a child corresponds with less than 2500 grams of weight at birth. This is usually related to the malnutrition of the mother.

2/ Second-degree malnutrition refers to body weight 60-75% of the established norm; third-degree manlutrition includes any child below 60% weight of the norm (See Appendix 5).

concentration of land ownership, a sharecropping system, marketing deficiencies and an inadequate social infrastructure, served as underlying constraints to improvement in the nutritional condition.

1.10 Breastfeeding is declining in Brazil. A common urban practice in Northeast Brazil is for mothers to wean their children at five or six weeks and substitute manoic gruel--manioe flower mixed with very deluted milk-- for breast milk. Mothers are reluctant to feed children fruits or vegetables; meat and eggs are considered noxious. Heavily promoted commercial milk-based baby formulas are often used, but because of income limitations, the product is frequently over-diluted, and served unhygienically. Infant diarrhea often results, leading to malabsorption, malnutrition and increased severity of otherwise minor childhood infections--all factors contributing to the high infant mortality rate.

1.11 Although Brazil has a large food industry, only modest attention to date has been directed to developing and marketing low-cost nutritious products. Several food technology institutes in Brazil have not given priority attention to the needs of low-income consumers. The cost of conventional manufactured baby foods ranges from US$1.34 to US$3.33 equivalent per kilo--beyond the reach of the poor. A few products employing new technologies and non-conventional sources of protein, that would lower the cost, have not yet been generatedon a large scale.

1.12 Insufficient attention has been directed to food losses. Cereal products, such as wheat flour and rice, lose some of their important nutrients during processing. Whereas fortification of the processed grain with vitamins and minerals is now standard practice in many industrialized countries, in Brazil it is not. Brazil has a program to iodize salt, but the performance is not fully effective.

II. THE NUTRITION RESEARCH AND DEVELOPMENT PROJECT OF BRAZIL

2.01 Malnutrition is widespread in Brazil and is especially serious in the Northeast, where the infant mortality rate is among the highest in Latin America. The Government of Brazil recognized the gravity of this problem and responded by developing a comprehensive national nutrition plan and providing increased resources for an integrated national nutrition program.

2.02 The overall approach of this program relies on the principle that improvement of nutritional conditions of a population depends largely on a reduction of the costs of producing and marketing basic foods and on better distribution of income. This program hopes to meet the most urgent needs of vulnerable groups through the development and execution of low-cost interventions, while laying the base for broader policies and programs designed for more fundamental and longer-term impact on malnutrition in Brazil.

2.03 In order to start on such an effort the Government of Brazil needs to build the basic prerequisites, such as (i) sufficient knowledge of the nature and extent of malnutrition and more precise understanding of its causes; (ii) trained manpower and institutions capable of implementing large scale nutrition programs; and (iii) knowledge concerning the effectiveness of alternate forms of delivering nutrition services, especially for nutritionally vulnerable pre-school children, pregnant and lactating women.

2.04 For these reaons the Government of Brazil, and the World Bank approved in 1976 a Nutrition Research and Development Project, to be implemented from 1977 through 1980. A brief outline of this project (including the major objectives, project components, its organization, cost and financing) follows.

A. PROJECT OBJECTIVES

2.05 The primary purpose of the Nutrition Research and Development Project in Brazil is to counter malnutrition among pre-school age children, pregnant and lactating women of low-income families, in order to help launch the national nutrition effort on a sound basis. The project is oriented toward research and testing of various delivery experiments. The project is designed to provide the Government of Brazil with basic information, institutional and manpower capabilities, and adequate quantities of certain high-priority inexpensive food products, in order to permit the Government to more effectively plan and deploy resources of the National Food and Nutrition Program.

B. PROJECT COMPONENTS

2.06 The major components of the Nutrition Research and Development Project in Brazil are:

a) The development of an information base through (i) a national nutrition and food consumption survey and periodic surveillance of nutrition conditions; and (ii) the continuous assessment of nutritional implications of agricultural policies.

b) The testing of the effectiveness of nutritional interventions through the following alternative delivery systems: (i) rural extension services; (ii) urban and rural health services and commercial markets; and (iii) the school infrastructure.

c) The development and commercialization of nutritious foods through: (i) a research and development program for low-cost processed foods; (ii) engineering and marketing feasibility studies for industrial-scale production of such foods; and (iii) investment credits to stimulate industrial production of low-cost nutritious foods, including the fortification with indigenous materials of processed food staples.

d) Training program and manpower studies; and

e) Assistance for INAN to support project planning, management, monitoring and evaluation.

2.07 Since this paper is primarily concerned with monitoring and evaluation of nutritional interventions (component b), only the specific objectives of each of the proposed tests of nutritional effectiveness will be described below:

(i) Nutritional Interventions through Rural Extension Services

2.08 The major purpose of this project component is to test the effectiveness of agricultural extension services, as a vehicle for improving nutrition status of the target groups. The test involves 5,400 low-income farm families, with holdings generally below 50 ha, in 12 municipios in the Northeastern State of Sergipe. The paticipants receive varying combinations and intensities of both agricultural and social extension. The objective of agricultural extension is to increase output through better farm planning, the application of improved agricultural practices, improved on-farm processing and preservation, and access to the necessary agricultural inputs and credit. In the project areas, existing technology packages appear satisfactory as a starting point for the proposed activities. Social extension is primarily concentrated on education concerning the proper nutritional use of existing family resources (e.g. extension of the breastfeeding period, improved sanitation and improved intra-family food distribution) and the use of increased production and increased income (made possible by the agricultural

advances) in nutritionally beneficial ways. A total of 30 health mini-posts will be opened to provide basic health and nutrition services. These health centers and the social extensionists would cover, in addition to the families of the selected farmers, those of the landless poor and tenants within their respective jurisdictions. By the end of the fourth project year (1980) it is estimated that a total of 45,000 persons would be covered by health and nutrition services.

(ii) Nutritional Interventions through Health Services and Commercial Markets

2.09 In an existing maternal and child health program run by the State University of Pernambuco in the low-income area of Recife (Encruzilhada, Santo Amaro and Berberide) the project studies the benefits from adding nutrition services to existing health units. Approximately 34,000 children under six years of age and 10,000 pregnant and lactating women will benefit from this project. For about 45% of this group, food would be provided through two food delivery sysems: distribution through the health system and distribution through the normal commercial food channels. In the case of the latter, the health staff would provide coupons which target groups would redeem for food supplements.

2.10 This component would test: (i) the efficiency of health and commercial delivery systems as vehicles for nutritional intervention; (ii) the managerial capability of the Government's health system to carry out such programs; and (iii) the community's response to the programs in the Northeastern State of Pernambuco.

2.11 The project also provides for studying the nutritional effectiveness of extending the outreach into rural areas of typical maternal and child health programs currently operated in Zona da Mata. The project would finance nutrition education (including efforts to extend breastfeeding to six months) to 12,000 beneficiaries.

(iii) Nutritional Interventions through School-Feeding Network

2.12 This project component includes tests to determine the nutritional impact and efficiency of feeding pre-schoolers by taking advantage of the existing transport, storage and other facilities of a large ongoing school feeding program. Feeding is being tested among children of low-income families in Pernambuco. The normal channels of the State Department of Education operates the program.

2.13 Nutritional interventions through school-feeding are being tested through three types of school-feeding: (i) daily care of children 4 to 6 years for 220 days per year; (ii) care on alternative days for 130 days per year; and (iii) daily care of children 6 years old, during the school holiday period of 60 days, before they enter the first grade.

C. PROJECT ORGANIZATION

2.14 INAN is responsible for the overall administration and coordination of the participating agencies. Figure 1 shows the participating agencies and the nature of their relationship to INAN.

D. PROJECT COSTS

2.15 The total cost of the project was estimated at US$72 million equivalent. Estimates of the cost of each of the project components are shown in Table 1. Some 60% of the total base costs (i.e. total project cost minus contingencies) would be used for the development and commercialization of nutritious foods. Almost one-fifth or 18% of the base costs of this project is allocated to test the effectiveness of nutrition interventions through alternative delivery systems. The remaining 22% would be split between the development of an nutrition information base (11%), training programs (5%) and management support to INAN (6%).

2.16 The project is financed by a World Bank loan of US$19 million, which was approved in June 1976, to the Federal Republic of Brazil for a term of 18 years, including five years of grace, and an annual interest rate of 8.85%. The balance is provided by the Government of Brazil and the participating industries (see footnotes Table 1).

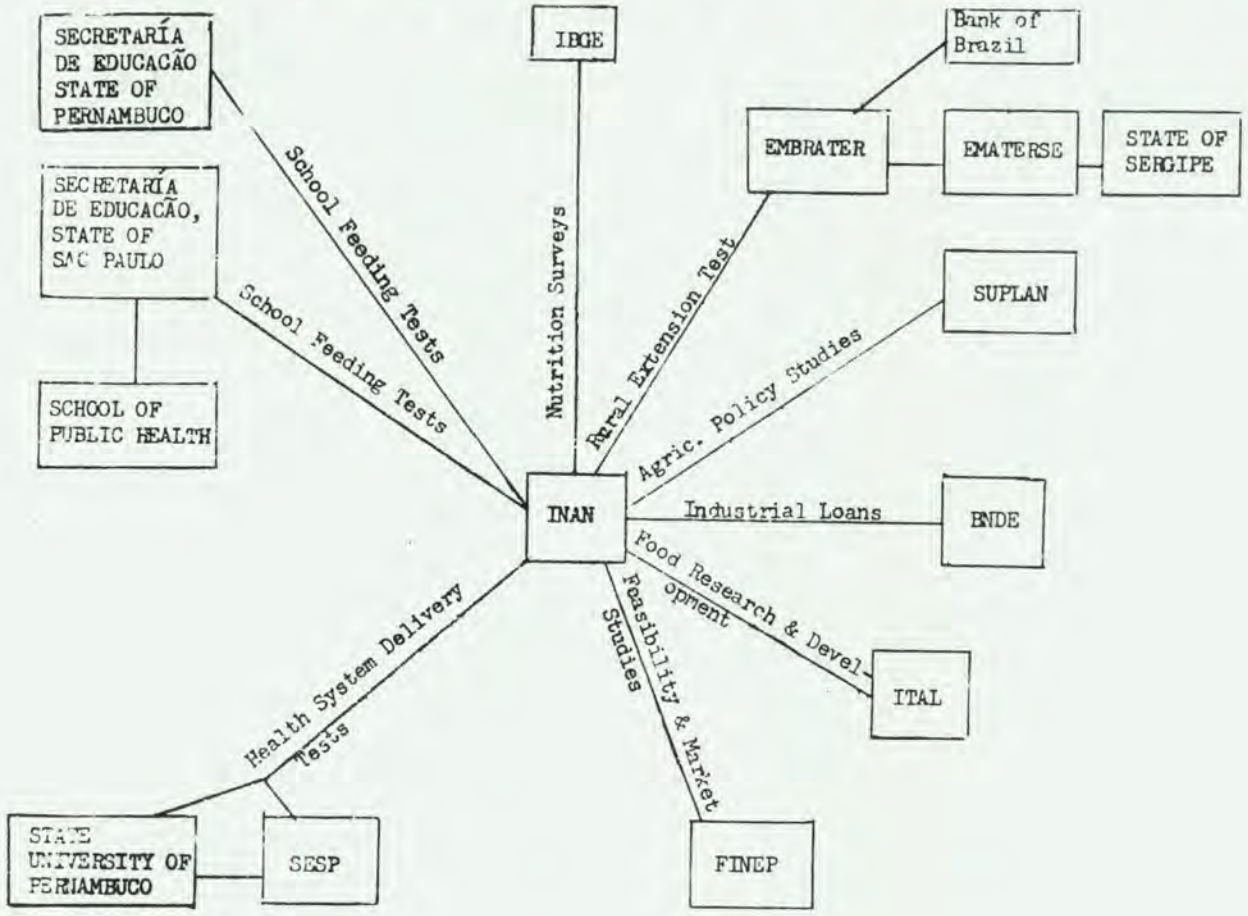
E. EXPECTED PROJECT BENEFITS

2.17 As a result of the project, the Government of Brazil would (a) improve its understanding of the magnitude and implications of the nutrition problem and the relationship of nutrition status to agricultural policies; (b) obtain a cadre of trained officials and strengthened institutions, equipped to plan and implement a national program; (c) have an assessment of the effectiveness of several delivery systems and have the practical experience provided by the testing of such systems; and (d) have locally produced low-cost nutritious products for institutional and commerical markets. During the last year of the project, the Government intends to develop a refined comprehensive national nutritional program.

2.18 In the process of carrying out the tests, the health and performance would be improved of approximately 126,000 young children and related pregnant and lactating women from low-income families who would benefit directly from food supplementation and/or other nutrition services. School attendance, performance, and subsequent productivity would be increased for older children. Productivity of a substantial, but interminate portion of the low-income labor force (and their families) would be expected to increase through consumption of low-cost processed nutritious foods. Increased food productivity would be expected to take place among families of 5,400 small farmers in Northeast Brazil.

FIGURE 1

PARTICIPATING ENTITIES IN NUTRITION RESEARCH AND DEVELOPMENT PROJECT



Acronyms

BNDE	Banco Nactional de Desenvolvimento Económico (National Economic Development Bank)
EMATERSE	Empresa de Assistencia Tecnica e Extensao Rural - Sergipe (Brazilian Enterprise for Technical Assistance and Rural Extension in Sergipe)
EMBRAPA	Empresa Brasileira de Pesquisa Agropecuaria (Brazilian Enterprise for Agricultural Research)
EMBRATER	Empresa Brasileira de Assistencia Técnica e Extencão Rural (Brazilian Enterprise for Technical Assistance and Rural Extension)
FINEP	Financiadora de Estudos e Projectos (Agency for Funding Studies and Projects)
IBGE	Instituto Brasileiro de Geographia e Estatística (Brazilian Institute for Geography and Statistics)
INAN	Instituto Nacional de Alimentacão e Nutricão (National Food and Nutrition Institute)
ITAL	Instituto de Tecnologia de Alimento (Institute of Food Technology)
SESP	Fundacão Servicos de Saude Publica (Public Health Services Foundation)
SUPLAN	Subsecretaria de Planejamento e Orcamento - Ministerio de Agricultura (Subsecretariat of Planning and Budgeting - Ministry of Agriculture)

Table 1

ESTIMATES OF THE COST OF PROJECT COMPONENTS
('US$'000; 1976 prices)

Project Component	Project Costs		Percentage of Total
A. Nutrition Planning and Programming			
1. Nutrition Survey and Surveillance Systems	2,706		
2. Food and Nutrition Policy Research	3,865		
Subtotal		6,571	11%
B. Testing Alternative Nutrition Delivery Systems			
1. Rural Extension Services 1/	6,347		
2. Health Services and Commercial Markets	3,644		
3. School Feeding Program	1,136		
Subtotal		11,127	18%
C. Development and Commercialization of Nutritious Foods			
1. Research and Development Program	4,672		
2. Feasibility and Marketing Studies	3,000		
3. Industrial Loans 2/	30,000	37,672	60%
D. Nutrition Training Program		3,266	5%
E. Organization and Management 3/		3,605	6%
TOTAL BASE COST		62,241	100%
Contingencies		9,723	
TOTAL ESTIMATED PROJECT COST		71,964	

1/ Includes US$1.5 million loan of the Bank of Brazil.
2/ Includes a contribution of US$6 million (20%) by participating industrial units.
3/ Includes Special Fund of US$885,000 to be used by INAN subject to prior Bank approval.

III. A CONCEPTUAL FRAMEWORK FOR MONITORING AND EVALUATION

3.01 To measure the success of the Nutrition Research and Development Project in Brazil, it is necessary to keep track of the extent to which the goals, objectives, and planned benefits are realized through project implementation. This requires the generation and analysis of information on project inputs and results. For this purpose, a variety of information generation and reporting systems are used. These information tools are generally defined as management information systems which include a general cost accounting system, internal auditing, reporting, monitoring and evaluation.

A. Reporting

3.02 A reporting system is necessary to obtain a continuous information flow on the financial and physical progress of the project and its components. It consists of an Internal Reporting and an External Reporting System. Internal reporting refers to the information flow from the project area to the (central) project management. External reporting refers to the information flow from project management to the management of other Government and international agencies (such as the World Bank which requires its borrowers to report regularly on project progress). The reporting systems produce information on inputs, activities (their actual starting date, duration and completion as compared with the planned schedule) and outputs.

3.03 The reporting systems should be designed to furnish each manager with the information which he needs for managing the project. He should receive such information when he needs it, in the form that he can easily understand and that stimulates the appropriate actions.

B. Monitoring

3.04 To verify measurable project objectives, to see if these are met and, if not, to see that appropriate action is taken on problems encountered, monitoring and evaluation systems are included in the project. The measurable project objectives are as follows:

- Project Outputs are the (physical) outcome of project activities. Examples of outputs of the Nutrition project in Brazil are acreages planted, cooperatives established, credit provided, health facilities constructed, food distributed, teachers and mothers trained, etc.

- Project Effects are the outcome of increased use made of project outputs. Examples of the effects of the Nutrition project in Brazil are increased production, higher crop yields, increased use of the health services, increased enrollments, lower absenteeism in schools, etc.

- Project Impact is the change in the standard of living or the increased capacity for self-sustained development of a group of beneficiaries or communities resulting from project effects.

In the case of the Nutrition project in Brazil, these changes can be measured by increased consumption, improved diets, improved nutritional status, reduced mortality and incidence of diseases, better school performance, increased literacy, etc.

3.05 Monitoring can thus be defined as the timely gathering of information on project inputs, outputs and complementary activities that are critical to the attainment of the objectives of the project. It utilizes baseline information collected during the design and preparation phase, and continues throughout the project's lifetime when it compares actual inputs and ouputs, and activities with the expected or planned levels. It alerts project management and policy makers to potential implementation problems requring corrective action. It may also provide the necessary information for the instigation and preparation of ongoing evaluation.

3.06 As defined above, monitoring emphasizes how information is channeled to project management for decision making. The major functions of monitoring is the control of sound progress of implementation of the project. To be effective, monitoring must provide quick feedback to project management.

3.07 Monitoring overlaps extensively with the reporting system since it relies partially on the information produced by the internal management reports. It often requires, however, the generation of additional information on the project implementation. The results of monitoring are often reflected in the project management's external reports to the management of other agencies.

3.08 While monitoring and reporting overlap considerably, monitoring goes further in that it analyzes and recomends actions to correct deviations from planned results. Often it requires diagnosis of implementation problems and generation of additional information through interviews, field observations, discussions with project staff, special studies, etc. To maximize implementation effectiveness, monitoring requires early warning of project management about problems, together with recommendations for corrective actions.

3.09 Monitoring requires a simple system that provides continuous feedback of key indicators on project progress. It should be based on simple approaches for collection of the absolute minimum information that can be cheaply and easily collected, on time, for quick feedback to the project management.

C. Evaluation

3.10 Evaluation, on the other hand, is the comparison of actual project effects and impact against the established plans. It can either be ongoing or ex-post. Ongoing evaluation is an analysis during project implementation of project outputs and effects. The purpose of ongoing evaluation is to provide information on a continuing basis to project management and policy makers to enable them to assess, and if necessary, adjust policies, objectives, institutional arrangements and resources affecting the project during implementation.

Expost evaluation is an analysis after project completion of the project effects and impact. The purpose of expost evaluation is to provide policy-makers information for future planning of projects/programs.

3.11 As defined above, evaluation assesses the extent to which the planned project effects and impacts have been realized. It tries to determine whether the planned benefits envisioned for the project are being achieved, and how they are distributed. While evaluation relies extensively upon monitoring, it requires additional information (data which is not routinely gathered) through surveys, interviews and observations. Often, it covers selected project components over a long time span or concentrates on particular critical issues.

3.12 In summary, monitoring of project progress, focuses primarily on "what" is or is not happening (i.e. project inputs and outputs), while evaluation, either during or after project implementation, would aim at explaining "why" project effect and/or impact were or were not achieved.

3.13 Based on this conceptual framework the following sections outline the design and progress made on monitoring and evaluation of the Nutrition Research and Development Project of Brazil.

IV. KEY INDICATORS FOR MONITORING AND EVALUATION

4.01 To design monitoring and evaluation systems, it is important to have clearly stated objectives, quantified into targets. It is also important to realize that some ultimate goals of a project can only be achieved through intermediate objectives, and that these can themselves be achieved by successfully implementing a series of detailed implementation objectives regarding project inputs and activities. Thus, a "hierarchy of objectives" needs to be developed that permits showing of the linkages between project inputs, activities, outputs, and the expected effects and impact resulting from them.

4.02 The major advantage of a "hierarchy of objectives" is a systematic presentation of project objectives and targets along various levels. This sets the stage for determining and validating whether or not the project outputs are being produced; whether these outputs in fact are producing the intended effects; and, finally, whether these effects are making a contribution to the planned ultimate project impact. Such a hierarchy permits continuous re-examination of the original design. It also permits the selection of key indicators that would allow to verify whether project objectives are achieved.

4.03 Key indicators to measure the effects and impact of the Nutrition Research and Development Project are shown in Table 2. This table lists, for each of the objectives of nutritional intervention tests, the specific targets that are expected to be achieved. For example, the nutrition interventions through rural extension services would attempt to reduce by 80% the prevalance of second and third degree malnutrition in children 0 to 6 years in Sergipe. For the nutritional interventions through health services, annual targets are given for the reduction of malnutrition, infant mortality and for the increase in birthweights, immunization coverage, and periods of breastfeeding for newborns. Each of the effects specified in Table 2 are expected to result from project activities, the immediate outputs of which are detailed in the following section.

TABLE 2

KEY INDICATORS FOR THE MEASUREMENT OF EFFECTS AND IMPACT OF NUTRITIONAL INTERVENTIONS THROUGH THREE DELIVERY SYSTEMS

EFFECTS AND IMPACT OBJECTIVES	OBJECTIVELY VERIFIABLE INDICATORS
I. Nutritional Interventions through Rural Extension	
A. Nutrition and Health Effects	By 1980:
A1. To increase food consumption of the family level	A1. Attainment of minimum intake of 2,200 calories per capita in the target group
A2. To reduce the prevalence of various forms of malnutrition	A2. Reduction by 80% of prevalence of 3rd. and 2nd. degree malnutrition among children 0-6 years receiving care at health mini-centers.
A3. To increase the weight/height of children 0-6 years	A3. Attainment of the norm weight/height ratio for 80% of children 0-6 years
A4. To reduce the the prevalence of infectious and contagious diseases	A4. Vaccination of 80% of children 0-6 years by 1980
B. Production Effects	
B1. To increase family disposable income	
II. Nutritional Interventions through Integrated Health Services and Commercial Markets	
A. Nutrition and Health Effects	
A1. To reduce 2nd. and 3rd. degree malnutrition in children under 6 years of age	A1. Reduction of malnutrition in children 0-6 years as compared with the baseline by: Second: 1978 5%; 1979 10%; 1980 15% Third: 1978 10%; 1979 15%; 1980 20%
A2. To reduce the percentages of children with birth-weight lower - than 2500 grams - than 3000 grams	A2. Reduction of percentages of infants with birth weights lower than: - 2500 g. 1978 5%; 1979 15%; 1980 30% - 3000 g. 1978 10%; 1979 10%; 1980 15% as compared with the baseline.
A3. To increase the rates of immunization coverage	A3. Attainment of the following percentages of the target group Groups I/IV: 1978 30%; 1979 40%; 1980 50% Group V/VI: 1978 60%; 1979 80%; 1980 100%
A4. To reduce infant mortality and child mortality in age groups 1 to 4	A4. Reduction of: Infant Mortality 1978 10%; 1979 15%; 1980 20%
A5. To increase food consumption of beneficiary families	A5. Increase consumption of beneficiary families by:

GROUPS

	I		II		III		IV		V		VI	
	Cal.	Prot.	Cal.	Prot.	Cal.	Prot.	Cal.	Prot.	Cal.	Prot.	Cal.	Prot.
3 *	2%	4%	2%	4%	2%	4%	2%	4%	2%	4%	2%	4%
6	7%	13%	7%	13%	7%	13%	5%	9%	7%	13%	7%	13%
12	15%	28%	10%	18%	15%	18%	5%	9%	15%	28%	15%	28%

* months after commencement of project

A6. To increase the percentage of breastfed infants	A6. Increase percentage of infants being breastfed for 1, 3, 6 months to:

Encruzilhada	1978	1979	1980
1 m.	60%	70%	75%
3 m.	30%	40%	50%
6 m.	15%	20%	25%
Mata-Sul			
1 m.	60%	70%	90%
3 m.	50%	60%	80%
6 m.	50%	60%	60%

III. Nutritional Interventions through School-feeding Network	
A. Nutritional and Health Effects	
A1. To improve the nutritional status of pre-school children	A1. Attainment of the norm weight/height ratio for at least: 80% of children age 4 70% of children age 5 60% of children age 6
A2. To improve the health status of pre-school children	A2. Reduction of rates of absenteeism "because of sickness" by 50% after one year of PROAPE by 60% after two years of PROAPE by 70% after three years of PROAPE
B. Educational Effects	
B1. To promote psychomotor, socio-emotional, and cognitive development of pre-school children	B1. Attainment after each year of operation of PROAPE of levels of psychomotor, socio-emotional, and cognitive development that are significantly higher than those of the control group, for the same age categories of children 4-6 years.

V. SYSTEMS FOR MONITORING OF PROJECT PROGRESS

5.01 Monitoring has been defined above as the periodic collection of information on inputs, activities and outputs, and their comparison with the original plan for the purpose of warning the Project Manager about potential implementation problems requiring corrective action. Applied to the Nutrition Research and Development Project, monitoring is mainly concerned with efficient implementation. Since the project is composed of several components, a distinction can be made between the monitoring of components and overall monitoring. The monitoring of project components requires control systems primarily for the managers of components to efficiently implement the activities and achieve the objectives of the components. Overall monitoring is a control system providing early warning about implementation problems (e.g., significant delays in the schedule, lack of staff, poor communication, etc.) to the overall Project Manager. The following sections describe simple monitoring systems that are currently applied at the various levels of activity of the Nutrition Project.

A. Monitoring by INAN

5.02 The purpose of overall monitoring by INAN is to be constantly informed of progress of the project and to insure proper and timely execution in accordance with the plans and objectives that have been mapped out. The overall monitoring system seeks to meet the need for a dynamic and flexible management of project implementation. It also meets the external reporting requirements of INAN.

5.03 INAN reports semi-annually to the Ministries of Health and Finance in Brazil and quarterly to the World Bank. The frequency of external reporting determines the minimum frequency of the internal reporting cycle. Thus, if semi-annual reports are required to the Ministries and quarterly reports to the World Bank, then the project component managers require to file at least quarterly reports to the Project Manager in INAN.

5.04 The specific objectives of monitoring the Nutrition Research and Development project are: (i) to control the progress of the project; (ii) to provide information necessary for effective implementation of the project; (iii) to detect problems and make suggestions of alternative solutions; and (iv) to provide basic data for evaluation of the relative cost-effectiveness of project components.

5.05 At the level of INAN, monitoring is accomplished by: (i) quarterly reports on physical and financial progress of the project; (ii) periodic field visits to observe progress; (iii) on-site project meetings between the Project Manager, and the staff responsible for implementation of project components; and (iv) joint meetings of the overall Project Manager, the managers and agencies involved in the project components.

5.06 The process of monitoring consists of the regular tabulation of the quarterly reports from each project component. It also includes the comparison of information from these quarterly reports with the original objectives and

activities planned for each component. Summaries are also made of field observations as well as of the diagnosis of problems in quarterly reports. Furthermore, forecasts are made on potential implentation problems, the ways and means to prevent their occurrence or to reduce their dimensions or consequences. A list of all the instruments used for overall monitoring of the project is shown in Table 3.

5.07 Based on these processes and instruments, the overall Project Manager produces quarterly reports to INAN and the World Bank. INAN reports semi-annually to the Ministries of Finance and Health. These reports contain: (i) quantitative and qualitative information of the progress of the project; (ii) a critical assessment of the premises, objectives, and activities accomplished; (iii) recommendations for adjustments and/or decisions required for effective implementation of the project; (iv) decisions made by INAN and other agencies that need to be transmitted to project implementors; and (v) a detailed implementation schedule for the next period.

5.08 In summary, the overall monitoring of the Nutrition Research and Development Project consists of an internal reporting system relying to a great extent on the information provided by component managers, complemented with field observations, and frequent on-site contacts between the Project Manager, project unit staff and the local responsible officers. In addition to this, regular working sessions are held between the overall Project Manager and the component managers. These meetings are used to discuss project progress and implementation problems. They also provide for on-the-job training through the exchange of experiences. Agencies involved in the project are invited to attend or contribute to part of these working sessions. In this way, the monitoring system for the project does not only provide an essential information base for effective implementation, but also serves a training ground for managers of nutritional intervention projects.

B. Monitoring of Project Components

5.09 Detailed operational plans have been prepared for the nutritional interventions through alternative delivery systems. Based on these the following monitoring systems have been established for each project component.

1. Monitoring of the Sergipe Component

5.10 As a basis for monitoring the nutritional interventions through rural extension services in Sergipe, all immediate outputs have been listed and annual targets specified. Table 4 shows the annual targets for all production, health and nutrition outputs expected from the Sergipe project. This table permits the identification of the basic data required for monitoring the project.

5.11 Three types of basic data are necessary: (1) information on the quantity and quality of available human, material, and financial resources as well as the use made of them; (ii) information concerning the activities resulting from technical assistance, the use of supporting instruments (e.g, cooperatives), and the provision of different types of credit; and

TABLE 3
MONITORING AND SUPERVISION OF PROJECTS
Instruments

PROJECT	MONITORING AND SUPERVISION INSTRUMENTS	ORIGIN	HOW OFTEN	CONTENTS	DOCUMENT GENERATED
• CIN • Agro-Industry • Human Resources • Food Technology • Agric. Policies • PROAPE • CEAPE • PRAMEN-SE • PINS	Record of Data	Executive Units and GT/UPBB		Events of importance to the Project	Report (Reference)
	Progress Report on the Projects	Executive Units	Quarterly or as each stage is completed	Activities performed, difficulties encountered, solutions proposed, results;	Report (Partial and Final)
	Inter-institutional Meeting			Discussion of matters related to Project preparation and implementation.	ATA, Report
	Audit	INAN		Monitoring and Supervision of the physical and financial execution of the Projects.	Report on recommendations
	Supervision	GT/UPBB		Monitoring of Project execution.	Supervision Report
	Timetable for Execution	Executive Unit	Monthly/Quarterly/ Annually	Projected activities and assignment of competent Officers.	Physical and financial timetable
	Financial Implementation	Executive Unit	Monthly/Quarterly/ Annually	Financial status of the Projects (origins and destination of funds).	Budget implementation table

TABLE 4 INDICATORS TO MEASURE THE OUTPUTS FROM INTERVENTIONS THROUGH RURAL EXTENSION

OBJECTIVES	OBJECTIVELY VERIFIABLE INDICATORS
A. PRODUCTION OUTPUTS	
A1. To increase the area planted with corn, beans, and other crops	A1. Area planted will increase at average rate of 25% per annum
A2 To train farmers in farming and management practices	A2. Farmers trained: 1,500 in 1977; 1,700 in 1978; 2,100 in 1979; and 2,400 in 1980
A3. To provide agrotechnical and management assistance to farmers	A3. Farmers assisted: 3,240 in 1977; 4,300 in 1978; 5,400 in 1979; and 6,200 in 1980
A4. To improve services performed at existing cooperatives	A4. "Improved output marketing, supply of goods, and farm mechanization
A5. To increase the prices received by producers	A5. Establishment of the mechanisms that will ensure producers "minimum prices"
A6. To provide credit and CAP resources for producers	A6-7. Attainment of following physical yields (kg/ha) during the project period:
A7. To increase physical yields of crops of corn, beans, and cotton	Production System *
	Products I II III
	Corn 1,434 1,057 830
	Beans 760 560 440
	Cotton - - 311
	* See above
A8. To increase employment at agricultural establishments	A8. Indicator to be established in September 1978
A9. To provide alternative channels for marketing of output	A9. Disclosure of mechanisms of CAP, purchase of output produced
A10. To organize producer groups	A10. Organized producer groups: 216 in 1977; 288 in 1978; 360 in 1979; and 413 in 1980
B. NUTRITION/HEALTH OUTPUTS	
B1. To organize health associations	B1. Organization of 30 health associations
B2. To train mothers in health and nutrition activities	B2. To be determined in May/June 1978
B3. To promote tetanus antitoxin vaccination among pregnant mothers	B3. Vaccination of 50% of pregnant women with tetanus antitoxin in 1977; 65% in 1978; 80% in 1979; and 100% in 1980
B4. To promote vaccination against tetanus, tuberculosis, whooping cough, diphtheria, polio, measles, and meningitis	B4. Vaccination of 50% of children in 1977; 65% in 1978; 80% in 1979; and 100% in 1980
B5. To care for pregnant women at health mini-centers	B5. Care for 50% of pregnant women at health mini-centers in 1977; 60% in 1978; 70% in 1979; and 80% in 1980
B6. To treat cases of syphilis diagnosed in spouses	B6. Treatment of 100% of cases of syphilis diagnosed in spouses at the health mini-centers during the period of the Project
B7. To increase natural feeding of infants 0-6 months old	B7. Increase the length of natural feeding of 100% of infants less than 1 month old, of 80% of infants less than 3 months old, and of 40% of infants less than 6 months old.
B8. To improve home water supply through introduction of filters	B8. Introduction of home filters for 40% of families assisted in 1977; 60% in 1978; 70% in 1979; and 80% in 1980
B9. To promote construction of cesspools among assisted families	B9. Same percentages as for home filters
B10. To promote the introduction of silos for food storage at household level	B10. Introduction over the project period of 1,500 household silos as follows: 600 in 1977; 300 in 1978;300 in 1979; and 300 in 1980
B11. To increase the availability of food at family level	B11. See production and silo targets
B12. To improve the utilization of food among populations at risk	B12. Number of mothers trained
B13. To promote health mini-posts	B13. Installation and/or construction of 30 health mini-posts in 1977
B14. To increase hemoglobin level in pregnant women	B14. Attainment of hemoglobin level X among 80% of the pregnant women treated at health mini-centers during the project period

(iii) information on the efforts of ATER aids 1/ and the results of their actions, quantified in terms of the level of adoption of practices, and use made of facilities by farmers.

5.12 At the project level monitoring is accomplished through two complementary processes, providing for qualitative and quantitative information. qualitative information is obtained through supervision, by the component manager by EMBRATER 2/ and by INAN staff. Quantitative information is obtained through three types of internal reports. The first type of report is monthly descriptions of the progress of the project, the occurrence of factors that may impede accomplishments of goals set for the period, aspects relating to the capability of the staff responsible for execution, and other events considered to be of importance within the timetable of activities. The second type of report indicates the work effort through a comparison of planned versus accomplished activities. The third type of internal report reflects the expenditures of the project for each method.

5.13 To produce these reports, a system of information flows and formats have been developed. A complete set of the forms used for monitoring the Sergipe project is shown in Appendix I. This system consists of the following set of forms: each extension agent keeps a daily journal on project activities (see Form 1, Appendix 1); this information is aggregated at the municipio level. There, internal control sheets (Forms 2 to 4) and a register of each farmer (Form 5) attained by the project is kept. Monthly information on farm inputs, activities and outputs is passed on to the central office of EMATERSE 3/ in Arcaju (e.g. Form 6). All of the monthly information from these forms is used to make quarterly summary reports that are sent to INAN (Form 7, Appendix 1). In addition to these forms, procedures have been developed for filling in each form and special one-to-two day sessions were organized to train extension agents in data collection.

5.14 The first results from this montoring system show that, as of December 1977, a few months after field operations started, some 231 groups of farmers have been formed, involving 3,567 farm families. Each group consists on the average of 15 farmers. The social extension agents have registered 3,083 families.

2. Monitoring of the Encruzilhada and Zona da Mata Component

5.15 The immediate outputs expected from the nutritional interventions through health services and commercial markets in Encruzilhada (Recife) and Zona da Mata are shown in Table 5. Specific annual targets are again the essential basis for monitoring this project component.

1/ ATER aids are local people providing technical assistance to rural extension agents.

2/ EMBRATER is the Brazilian enterprise for Technical Assistance and Rural Extension Services.

3/ EMATERSE is the Enterprise of Technical Assistance and Rural Extension Services in Sergipe.

TABLE 5: INDICATORS TO MEASURE THE OUTPUTS FROM NUTRITIONAL INTERVENTIONS THROUGH INTEGRATED HEALTH SERVICES AND COMMERCIAL MARKETS

OBJECTIVES	OBJECTIVELY VERIFIABLE INDICATOR
1. To establish a COBAL and FSESP food distribution network	1.1 Number of food distribution units: 4 units in 19/7/78 in Encruzilhada; 2 in Mata subarea
	1.2 Starting in November 1977, sale of 30%, 45% and 60% subsidized foods to 10,000 families in Encruzilhada. Supply of gratis food to 5,000 families in Recife and Mata Sul area
2. To renovate 1 peripheral station to supplement existing health system	2.1 Renovation of 1 unit in 1977
	2.2 Starting in November 1977, meeting of 100% of demand for treatment activities of beneficiary families
3. To provide appropriate education on breastfeeding	3.1 Administration of specific education on breastfeeding to 100% of pregnant women and nursing mothers who receive gratis food and to 2,500 families who receive a 45% food subsidy
4. To survey family dubgets	4.1 Surveys on budgets of 250 families selected at random; survey frequency should be as follows: 1) before commencement of food distribution; and 2) quarterly thereafter
5. To design and obtain basic data from beneficiary population	5.1 Three random population samples (before commencement of food distribution and annually thereafter)
6. To organize coordination, evaluation, supervision, and operation units	6.1 Allocation of all staff and preparation of operation and supervision manuals by November 1977

5.16 The system for monitoring these nutritional interventions is based primarily on information generated by the health units and the COBAL 1/ markets. Formats for gathering data at the health units and commercial markets are attached as Appendix 2. For each visit at a health unit an IBM card is filled out on the indicators related to the operational objectives for this project (see Forms 1 and 2, Appendix 2). At the COBAL market a similar card is filled out by the cashier at the time the food is purchased. Both types of cards are forwarded to CETEPE 2/ for computer processing and analysis. Monthly, CETEPE provides the component manager will information regarding the number of health visits and the acquisition of food by registered families. All information is stored in the computer allowing for easy access and processing of the data.

5.17 The primary sources of qualitative data are the work journals of the supervisors of the health units. Reports on day-to-day activities and problems from the supervisors are forwarded to the manager of this project and discussed in weekly meetings between operators, supervisors, and the manager.

5.18 It may be important to note that, first, this monitoring system is based on continuous recording of each significant activity of the project. This is possible because of the relative simplicity of the administrative structure, the small size and geographical coverage of the project. Secondly, since there are only two supervisors, direct and easy access to the work journals can be expected. Thirdly, the nature of the qualitative data, and the fact that computer processing facilities are leased, permits rapid tabulation and synthesis of the information. This monitoring system can easily be extended to cover a larger number of beneficiaries spread over other geographical areas in case the project would be expanded.

5.19 Monitoring of the Encruzilhada and Zona da Mata projects is done by the supervisors through their control of the cards generated by health workers. In this way, supervisors acquaint themselves with the operational problems of the health units in question, record these problems in the journals and communicate them to the project manager. Along with guaranteeing proper functioning of the health services, this monitoring system also generates and ensures the collection of information for the testing and evaluation of all the alternative intervention models. Table 6 summarizes the monitoring system for this integrated nutrition and health project in the State of Pernambuco.

5.20 A recent review of the efficiency of this monitoring showed that carefully precoded questionnaires are used by teams of 4 to 6 enumerators who visit on the average 94 families per day to register families and to distribute food coupons (see Form 3, Appendix 2). From November 1977 to mid-January 1978, socio-economic information has been collected (through Form 4 of Appendix 2) on 22,582 families; and 18,945 families had been registered for the program. The distribution of families registered in the program among levels of food subsidy is shown in Table 7:

1/ COBAL is the Government's food purchasing Agency.

2/ CETEPE is a data processing center of the Office of the Secretary of Planning of the State Government of Pernambuco.

TABLE 6

Summary of the Monitoring System for the Integrated Nutrition and Health Project in Pernambuco

RESPONSIBILITY OF INFORMATION GATHERING	INFORMATION GATHERING INSTRUMENT	TYPE OF INFORMATION	FREQUENCY OF INFORMATION GATHERING
Health worker	- IBM card	- data on health visit (consultation)	- at the time of each visit
COBAL	- IBM card	- acquisition of food	- monthly
Supervisors	- work journal	- data on functioning of health units	- daily
CETEPE	- computer print-outs with basic tabulations	- updated register of families	- monthly
		- amount of food purchased	- monthly
		- health statistics	- monthly

MEETINGS

Supervisor/worker - weekly

Coordinator/supervisor - weekly

REPORTS

Supervision/coordination - daily (work journal)

Coordination/INAN - quarterly

TABLE 7: DISTRIBUTION OF FAMILIES REGISTERED IN THE PROGRAM AMONG LEVELS OF FOOD SUBSIDY

Food Subsidy Level	Number of Families Registered (as of January 1978)	Number of Families actually benefitting from Food Subsidy (as of January 1978)
60%	2,028	1,539
45%	9,232	4,728
45%	7,685	4,401
30% *	-	-
Total	18,945	10,668

* As of January 1978 the delivery of a 30% food subsidy had not yet been started.

5.21 In January 1978 two COBAL markets are operational, one of which is a mobile truck. A third one was opened in March 1978. Families in the program purchase food from these COBAL markets twice monthly. In one week in January 1978 some 2,049 families had benefitted from food subsidies. The amounts of food purchased in mid January 1978 attained 60% of the planned levels. In November 1977, when the project started, the amounts of food purchased was roughly 40% of the planned quantities. Furthermore the food take-up rate was higher for the 60% subsidy scheme (78% of the families registered for this scheme purchased food in January 1978) than for the 45% food subsidy schemes (60% of the registered families for these schemes used their food coupons).

5.22 Several criteria are used for the recruitment of families into the project. These criteria were established on the basis of following three indicators: (i) income; (ii) number of pre-school children; and (iii) women between the age of 15 and 45, with priority given to the ones that are pregnant or lactating. A Brazilian policy decision established the poverty line at two minimum salaries CR$1,736 (or US$108). In consequence, the dominant criterium for recruitment of families in the project is a family income below two minimum salaries. The use of two minimum salaries as a dominant criterion for recruitment of families into the program, poses several problems. First, this criterion does not take into account family size, nor the potential seasonal factors associated with the employment and the income earning power of poor families. As a result, there are on the average 20 mothers, who come daily to the Maternity Center in Encruzilhada, who have to be refused the benefits of the program. Secondly, the income criterion may not fully capture the particular nutritional situation of a family, whereby the benefits of the nutritional interventions may be obtained by those who are relatively less in need of them. Further careful monitoring of this aspect of the project is therefore required.

3. Monitoring of the Schoolfeeding Network

5.23 The Nutrition Research and Development Project also includes the testing of nutritional interventions through a school-feeding network for children 4 to 6 years old. For the purpose of monitoring specific annual targets were formulated for each of the objectives of this project component. Table 8 shows the quantifiable outputs that are expected and the indicators that would permit verification whether they are achieved. The monitoring of this project component, hereafter referred to as PROAPE, primarily relies on supervision and coordination.

5.24 Supervision is accomplished through weekly visits to the schools (each supervisor will visit five schools). The supervisors fill out a card on the progress made in teaching, and the management of the school. Monthly, the supervisor makes summary reports on the progress of the project in each school. These summary reports are forwarded to the project manager. In addition to this, COBAL provides quarterly information on the amount of food provided. At the state coordination level, monitoring consists of visits, meetings, and the review of regular reports. Three types of meetings are organized: supervisors meet weekly; monthly the Directors of the schools meet; and semi-annually the teachers meet with the project manager and his team.

5.25 In summary, monitoring of PROAPE consists of the supervision of the activities in the schools by the supervisors, and the control of supervision activities by the Project Manager in the Secretary of Education in Pernambuco and periodic supervision visits by INAN staff. The activities of COBAL and the manager are quarterly reported to INAN. A summary of the information flows established for monitoring this project is shown in Table 9. As of January 1978 3,823 preschool children in 22 schools (i.e. 63% of the target for 1977) were benefitting from daily or every other day school feeding and stimulation; in addition to this some 1,500 6 year olds (i.e. 75% of the target figure) are since January 1978 benefitting from school feeding during the holidays (before entering the first grade).

TABLE 8: INDICATORS TO MEASURE OUTPUTS FROM NUTRITIONAL INTERVENTIONS THROUGH SCHOOL-FEEDING NETWORK

OBJECTIVES	OBJECTIVELY VERIFIABLE INDICATORS
1. To involve first and second rank schools in pre-school care	1. 50% of schools in areas selected for PROAPE
2. To train supervisors, teachers, and mothers	2. 40 supervisors trained in 1977 40 supervisors recycled in 1978 60 teachers trained in 1977 60 teachers recycled in 1978 80% of mothers trained in 1977/78
3. To involve mothers in food supplement and recreational activities	3. Daily participation of one mother for each group of 25 children (rotating system) or involvement in 1977 of approximately 320 mothers and approximately 800 mothers in 1978/80
4. To provide technical guidance through supervision	4. No objectively verifiable indicator available
5. To increase the coverage of pre-school care in State of Pernambuco	5. Number of children that should receive pre-school care: Model A: 1977 3,000; 1978 8,000; 1979 8,000; 1980 8,000 Model B: 1977 3,000; 1978 8,000; 1979 8,000; 1980 8,000 Model C: 1977 2,000; 1978 4,000; 1979 4,000
6. To vaccinate and deworming of children under care, in accordance with official arrangement of Ministry of Health	6. Attainment of vaccination coverage rate of 60% of children remaining in project for 1 year, 80% of those remaining 2 years, and 100% of those remaining 3 or 4 years
7. To increase number of children who pass the tests of of first grade instruction in PROAPE schools	7. Achievement of 70% passing rate of first-graders who have had 1 year of PROAPE, 80% for children who have had 2 years, and 90% for children who have had 3 years
8. To collect information on socio-economic and cultural conditions of families of children under care	8. Visits paid to sample population and application of questionnaires
9. To administer visual and auditory tests	9.1 Visual and auditory tests on 8,000 children in 1977, and 20,000 children in 1978 9.2 Referral to health centers of 100% of children exhibiting visual or auditory deficiencies

TABLE 9

SUMMARY OF INFORMATION FLOWS FOR MONITORING PROAPE

LEVEL	INFORMATION AND TECHNIQUES	PERSON RESPONSIBLE	FREQUENCY
1. SCHOOL UNIT	1. Preparation of Cards and Forms on		
Nutritional supplementation and psychopedagogic activities	1.1 Data on school	Supervisor	annual
	1.2 Family data on pre-school child	Teacher	annual
	1.3 Tabulation of card 1.2	Teacher	annual
	1.4 Registration of pre-school children	Teacher	annual
	1.5 Anthropometric record	Teacher / Superv.	semi-annual
	1.6 Anthropometric report	Teacher / Superv.	annual
	1.7 Report on new enrollments	Teacher / Superv.	annual
	1.8 Attendance by mothers	Teacher	daily
	1.9 Rating of mothers	Teacher	weekly
	1.10 Food distribution control	Director/ Teacher	daily
	1.11 Attendance by children	Teacher	daily
	1.12 Educational activities conducted	Teacher	daily
	1.13 Teacher attendance	Director	daily

TABLE 9
(continued)

LEVEL	INFORMATION AND TECHNIQUES	PERSON RESPONSIBLE	FREQUENCY
2. SUPERVISION Functioning of School Units	2.1 Observation card on educational progress in School Units	Supervisor	weekly
	2.2 Summary card on project as a whole at the school	Supervisor	monthly
	2.3 Visit to School Units	Supervisor	weekly
	2.4 Meeting of teachers and director of School Unit	Supervisor	monthly
	2.5 Rating of teachers	Supervisor	monthly
3. CENTRAL COORDINATION General progress of project activities	3.1 Visit to School Units	(1) Coordinator (2) Coord. technical team	varies; as required
	3.2 Meetings with Supervisors	Coordinator	monthly
	3.3 Meeting with Directors	Coordinator	bi-monthly
	3.4 Meeting with teachers	Coordinator & technical team	semi-annual
	3.5 Observation card	Coordinator	varies according to visits
	3.6 Summary card	Coordinator	monthly
	3.7 COBAL report	Director	monthly
	3.8 Report	Coordinator	quarterly
4. INAN			
Supervisors	4.1 Visits	Project Unit Supervisor	monthly
	4.2 Observation Card	Supervisor	monthly
	4.3 Report	Project Unit Coordinator	quarterly

VI. SYSTEMS FOR EVALUATION OF NUTRITIONAL INTERVENTIONS

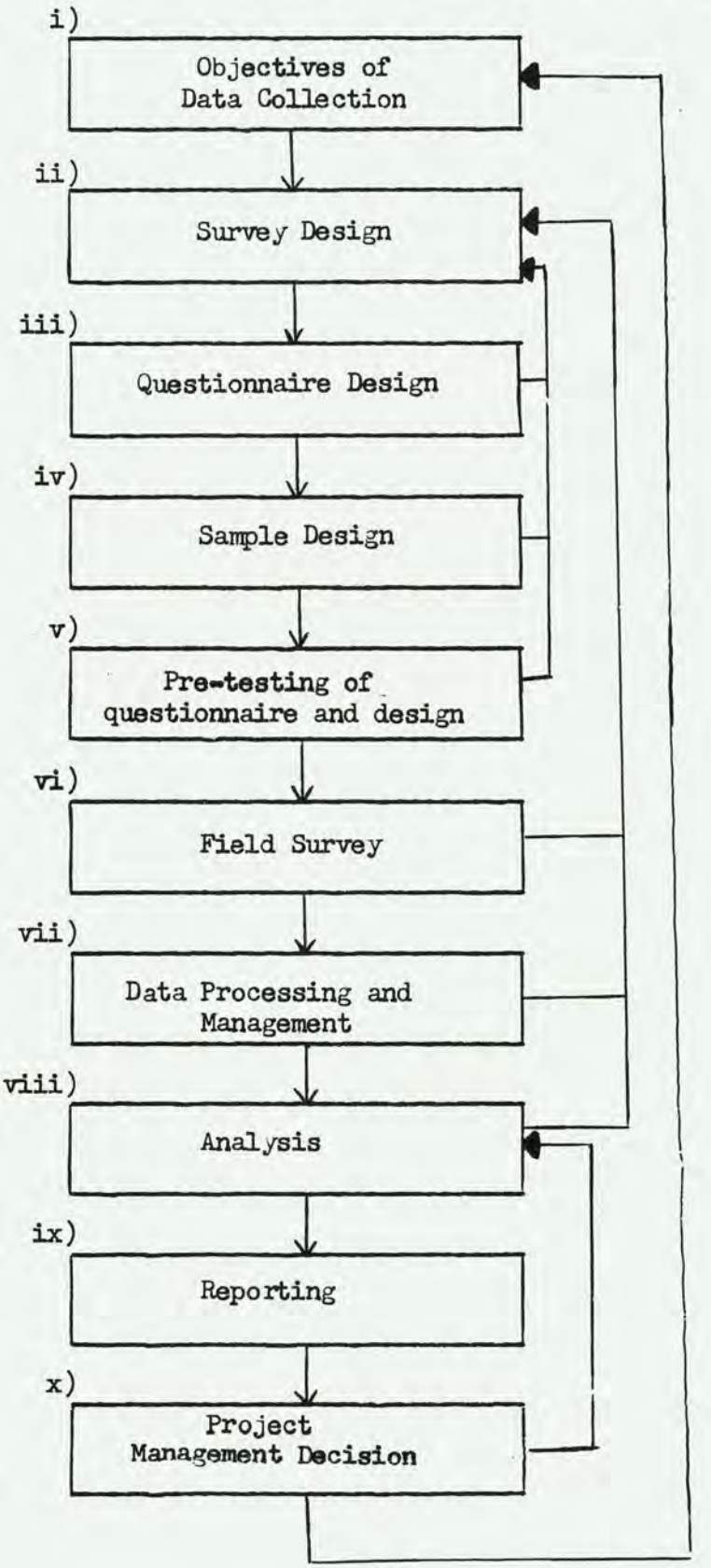
6.01 Evaluation was defined in Section III as an analysis of project effects and impact in order to provide feedback to management and policy makers on the objectives, institutional arrangements, and resources affecting the project. The major result expected from the Nutrition Project in Brazil is reduce malnutrition among pre-school children, pregnant and lactating women of low-income families. The project also aims to obtain better information for planning of nutritional intervention programs. In addition, the project is expected to generate information on cost-effective nutritional interventions. In consequence, the three major components of the Nutrition Project in Brazil require two types of evaluation:

(i) Component-specific evaluation that is an analysis of the cost-effectiveness of alternative models of interventions through a delivery system (e.g rural extension services, health services, commercial markets, school network). The outcome expected from component-specific evaluations would be a rank-ordering of nutritional intervention models, based on cost-effectiveness measures for each type of intervention through alternative delivery systems.

(ii) Overall evaluation is an analysis of evaluation results from the various components, with a special emphasis on comparisons that can be made across components (e.g., by age group, urban/rural differences, etc.). The ultimate objective of overall evaluation of the Nutrition project is to provide the Government with information on the relative cost-effectiveness of nutritional inverventions through various delivery systems.

6.02 For component specific evaluation, it is essential that each model of nutritional intervention is tested along the same lines as any other model in that component. For overall evaluation, it is important that a certain degree of compatibility is maintained between the evaluation systems for each of the components. The following factors influence the comparisons of evaluation results: (a) the type of information that will be collected; (b) the frequency of information gathering; (c) the efficiency of the information gathering systems; and (d) the tabulation, processing and analysis. To arrive at compatible evaluation systems, it is therefore necessary to standardize the evaluation designs for the individual project components and to design a pragmatic overall evaluation approach. To standardize the evaluation designs for three project components, the checklist of questions in Appendix 3 and the procedure listed in Figure 2 were used.

FIGURE 2: ITERATIVE PROCEDURE FOR DESIGN AND IMPLEMENTATION OF A SURVEY



6.03 Each of the following sub-sections therefore discusses:

(i) the purposes of evaluation;

(ii) the specific hypotheses to be tested;

(iii) the key indicators;

(iv) the survey and sample characteristics;

(v) the questionnaires to be used;

(vi) the timing and organization of field data gathering;

(vii) the data tabulation, processing and analysis procedures; and

(viii) the reporting of evaluation results.

A. Evaluation of Nutritional Interventions through Rural Extension Services

6.04 The major objectives of this project component have been discussed in Section II. In essence, the project area has been divided into four sub-areas. Farmers in each sub-area benefit from various intensities of agriculture and social extension services. The different intensities of agriculture and social extension services that are provided to the farmers are shown in Table 10.

Table 10

Models of Intervention in the Sergipe Project

Actions	Models A	B	C	D
Actions in the sectors of production, marketing, nutrition and health	Yes	Yes	Yes	Yes
Organization of farmers	Yes	Yes	Yes	Yes
Use of ATER - aids	No	Yes	No	Yes
Advance purchase of production	No	No	Yes	Yes

6.05 The main purpose of the evaluation of this component is to seek to identify cost-effective mixes of agricultural and social extension by careful control and analysis of various extension combinations. Information generated from the test would be used by EMBRATER and other relevant agencies in planning the deployment of resources for future rural development projects.

6.06 The specific hypotheses to be tested are: (i) each of the types of assistance has positive effects; (ii) the advance purchase of production reduces

the risks to producers (they will be disposed to produce higher quantities for a given set of resources and production potential); and (iii) the use of ATER aids increases the flow of technical and economic information available to producers, thereby improving their consumption and production decisions. The procedures that were developed to test these hypotheses are as follows:

(i) a baseline study;

(ii) selection of key indicators for the evaluation;

(iii) establishment of criteria for evaluation;

(iv) determination of the methodology for collection, processing and analysis of the data; and

(v) preparation of periodic reports.

6.07 The Baseline Study. A baseline study serves to describe the situation existing in the Project area prior to its implementation. The primary data have already been collected in a joint effort of EMATER-SE and the University of Viçosa. Data was obtained in two phases. The first consisted in the completion of 634 questionnaires by families of small farmers in two areas. The second involved 452 questionnaires in the other areas of this project component. The indicators used to describe the baseline situation will be the same as those used in the annual evaluations. These indicators are defined in the following section.

6.08 Selection of Key Indicators. The survey of the baseline and subsequent situations provides information on following key indicators:

Production Indicators:

- Absolute levels of production, by product
- Productivity of factors (land, capital and labor)
- Measures of economic performance: income from the land; income of the family unit; income by activity; net income; rates of return
- Distribution of production: home consumption and marketable surpluses
- Employment of family labor
- Volume of credit

Nutrition and Health Indicators

- Anthropometric data
- Mortality
- Indexes of hemoglobin in pregnant women
- Period of nursing
- Coverage by vaccination
- Food consumption
- Quantityof water consumed
- Waste disposal

Socioeconomic Indicators

- Adoption of technology
- Sources of credit
- Participation in cooperatives
- Use of advance purchase (CAP)
- Use of labor
- Importance of nutrition
- Perceptions regarding project actions

6.09 Evaluation Criteria. In essence, a comparison will be made of the above indicators over successive periods of time, in order to explain variations that may occur. It should be noted that the actions are area-specific; thus, the comparison of indicators between areas makes it possible to assess the effectiveness of the actions taken. The identification of variations over time is, however, not sufficient for decision-making by the executing agencies. The latter requires analysis of the factors explaining the variations observed (climatic factors, technological changes not induced by the actions taken, variations in prices of products and inputs), to isolate the effects of the project activities. Since the indicators reflect the results of the actions, it is expected that actions common to the four areas (action in the sectors of production, marketing, nutrition and health and the organization of producers) will not explain variations in the values of indicators in the inter-area comparison. It is therefore expected that activities such as the use of "ATER" aids and implementation of advance purchase of products (CAP), as well as factors not controlled by the Project, would explain variations on those key indicators. In the evaluation of the results, consideration will be given to common actions as well as specific actions. In at least one stage of the evaluation, a control group may be established with families not directly affected by the Project but included in the sample.

6.10 Methodology of Data Collection. Both primary and secondary data will be collected. The primary data is collected through surveys. These surveys are conducted among farmers with a maximum area of 50 ha. Farmers were classified in 3 strata: farmers with less than 10 ha., 10-30 ha., and 30-50 ha. Sample elements were selected at random from each strata so that a proportional representative sample is obtained. Surveys on production data are conducted annually in November. The health and nutrition data are gathered as follows: information on the use of health services and food consumption are gathered semi-annually; information on mortality, lactation, viccinations and anthroprometric data are gathered continuously and analyzed annually by the evaluation group. The total sample size is 600 families or 150 for

each intervention model. 1/ This represents 11% of the population to be reached (5,400 families). Some farm families may not be reached by the project. Information from them will be used for control purposes. Table 11 shows the stratified sample that is being applied to collect data on the Sergipe project.

Table 11

Stratified Sample for the Evaluation of Nutrition Interventions through Rural Extention Services in Sergipe

Strata	Models A	B	C	D	Total
Owner Operators					
0-10 ha	48	48	48	48	192
10-30 ha	36	36	36	36	144
30-50 ha	36	36	36	36	144
Subtotal	120	120	120	120	480
Sharecroppers	30	30	30	30	120
Total	150	150	150	150	600

The questionnaires that are employed for this study have been designed by the Department of Economic Research (DER) of the University of Viçosa (UFV). The questionnaires were pre-tested in June/July 1977. A complete set of the questionnaires used for the collection of information from farmers in the Sergipe project area can be found in Appendix 4. It should be noted that these questionnaires have been carefully pre-coded which facilitates key punching of the data from questionnaries, and the subsequently processing of the data.

1/ These sample sizes are a compromise between the minimum amount of information necessary to evaluate the effects and impact of this project component and the local capacity for data collection and, specially, data processing. Although some have argued that "it will not be possible to evaluate significant changes in infant or pre-school mortality with samples of 150 families..." (comment made by Dr. M. Bihar, Chief Nutrition Division, World Health Organization, in a personal communication of September 1977), others have warned against too large sample sizes because the problems they create in data management (Mr. N. Scrimshaw, Director, Department of Nutrition and Food Sciences, M.I.T.).

The data is collected by EMATER-SE technicians assigned to the project, who are supervised and trained by personnel of DER. The survey team consists of 30 enumerators and 4 UFV supervisors for collection of data and training of enumerators. Vehicles of EMATER-SE are used for transport.

6.11 The secondary data is obtained from the monitoring unit of the Project, and includes the following:

- Number of farmers groups formed
- Factors affecting the formation of such groups
- Techniques recommended in production systems
- Factors affecting the adoption of techniques
- Number and category of farmers benefited
- Value of contracts
- Purpose of financing
- Number and category of products benefited
- Factors affecting the participation of producers
- Volume of operations subject to direct purchase
- Performance of institutions in the implementation of CAP
- Factors affecting the participation of producers in CAP
- Number of health substations and health and nutrition activities undertaken
- Participation of communities in the activities in the substations
- Factors affecting the activities of the health substations
- Total costs of the project component and cost per project activity.

6.12 Processing of the data. As indicated above the questionnaires are pre-coded in order to facilitate keypunching and to permit direct transfer of the data to IBM cards. The data are processed on an IBM 360 computer at the Computation Center of the University of Viçosa.

6.13 Analysis of the data. Basic procedure for evaluation of the project consists of inter-area comparisons of key indicators. The variations observed will be analyzed in an attempt to explain significant differences over time and between sub-areas. The results from this will mainly consist of a series of relationships. In many situations (e.g. evaluation of production systems, productivity of actors of production, effectiveness of credit and others) functional relationships will be required to handle several variables simultaneously. These relationships will be examined empirically on the basis of cross-sectional data. The aspects that will be covered include the land tenure situation of the target population. This will be correlated with: (i) the extent of adoption of technology; (ii) the source of credit; (iii) the use of credit; (iv) the participation in cooperatives; (v) the use of advance purchase of products and (iv) the commitments assumed for the sale of products. A study will also be made of the changes in the use of labor that result from different actions. Changes in income will be examined, with identification of sources and uses. Attention will also be given to the dependency of farmers its effects on the marketing of products and other

relevant variables. Furthermore, farmers will be requested to identify the groups of which they are members, which will allow to assess the impact of the groups formed within the Project. The use of the services of the Project may be evaluated in part on the basis of the opinion of farmers regarding the various actions of the Project. Table 12 shows the expected timing of data collection and the completion of evaluation reports.

6.14 The cost of the evaluation of nutrition interventions through Rural Extension Services in Sergipe is estimated at CR$3.8 million or US$253,300.

B. Evaluation of Nutritional Interventions Through Health Services and Commercial Markets

6.15 Part of the Nutrition Project consists in testing: (i) the efficiency of health and related commercial delivery systems as vehicles for nutritional interventions; (ii) the managerial capability of the Government's health system to carry out such programs; and (iii) the community's response to the programs in the Northeastern State of Pernambuco (see Section II).

6.16 The project area is formed by the boroughs of Santo Amaro, Encruzilhada and Berberibe in the city of Recife, which have a population of 289,000 or 17,500 families, representing 22% of the city's total population. Almost one third of the population in the area has a family income of two minimum salaries or less. These families are considered at "high risk" of malnutrition and therefore elgible for nutritional interventions according to INAN's criteria. A total of 15,000 families from these low-income boroughs would be identified, brought to the health centers for registration, accreditation, and for clinical and anthropometric examinations of the children under 6 years of age.

6.17 These families are distributed in 6 groups of 2,500 each. Four groups receive subsidized food and two groups obtain free food. The same amounts of food will be distributed to each family, but three levels of subsidy are applied among the first four groups (see Table 13).

6.18 The food being supplied is based on: (a) the deficit of energy intake for the population; and (b) the food habits and the cost of each food item.

6.19 For the formulation of the food basket that is subsidized the following aspects were considered (see Table 14): the food basket (a) corresponds as much as possible to the daily energy deficit; (b) is formed by food items of general use; (c) is composed of staple foods; (d) does not exceed much the average daily amounts. The food basket covers 70% of the estimated energy deficit and meets also other requirements.

TABLE 12

SCHEDULE FOR EVALUATION OF NUTRITIONAL INTERVENTION THROUGH RURAL EXTENSION

REPORTING FREQUENCY	TIMING OF INFORMATION COLLECTION	COVERAGE OF PROJECT ACTIVITIES	COMPLETION OF EVALUATION REPORTS
Quarterly (Health and Nutritional activities only)	May 1977 April 1978 April 1979 April 1980	January-May 1977 November-March 1977/78 November-March 1978/79 November-March 1979/80	July/August 1977 June 1978 June 1979 June 1980
Annual	November 1977 November 1978 November 1979 October 1980	January-October 1977 November-October 1978 November-October 1979 November-September 1980	February 1978 February 1979 February 1980 January 1981
Final		January 1977-September 1980	January 1981

Table 13

Groups and Treatments for Nutritional Interventions Through Health Services and Commercial Markets

Group	No. of Families	Urban/ Rural Difference	Level of Subsidization	Participation in Health Services
I	2.500	urban	30% of the cost	-
II	2.500	urban	45% "	-
III *	2.500	urban	45% "	+
IV	2.500	urban	60% "	-
V	2.500	rural	free food	+
VI	2.500	rural	free food	+

* Group III will be compared with the Groups V and VI who receive free food and compulsory health services.

Table 14

Food Basket for Subsidy - Amounts per Persons per Day

Item	Amount in Weight (kg/month)	g/day	K Cal/day
Rice	2,5 kg	67 g	236,5
Cornmeal	0,5	14	46,2
Beans	2,0	67	254,6
Dried Milk	0,5	14	51,0
	5,0	162 g	588,3

6.20 Each family registered in the program receives a card (see form 3, Appendix 2) enabling it to purchase the established amount of food at the COBAL market, where the family pays cash for 30%, 45% or 60% of the price. Families in groups I, II, III and IV return to the program center once a year for renewal of accreditation, when clinical examination and anthropometry of children will be repeated. At that time additional information is obtained about mortality, new births, baby feeding practices and infant morbidity.

6.21 The health centers in the area maintain the regular activities available to all the families in the area (e.g. vaccination campaigns, treatment of patients coming to the center for medical assistance, orientation of families registered in the maternity and child health program). The families in the groups are eligible for these services. Families in group III receive in addition compulsory medical supervision at three month intervals.

6.22 A fifth group is admitted for control of Groups I to IV. This group is formed by 2,500 families recruited in the borough of Tegipio, from a population with comparable socio-economic conditions. The control group is submitted to clinical and authropometric evaluation, registered and accredited in the program. Accreditation and anthropometry data is collected each year, and food consumption surveys done at the same intervals as for the other groups. The control group does not receive a food subsidy, but is assisted by the Program for Nutrition and Health (PNS).

6.23 A sixth group formed by 2,500 families from the rural plantation area of Mata Sul is also included. These families receive food supplementation (milk, sugar, cornmeal and rice) gratis, corresponding to PNS plus health assistance by the health units of SESP (Public Health Services) Foundation. They also are accredited in the Recife program for evaluation; clinical exmaination and anthropometry are done by the SESP group.

6.24 The purpose of evaluating nutrition interventions through the health and commercial markets is to test four models of subsidized food distribution, and to compare them with two models of free food distribution. Specific hypotheses that will be tested relate to free versus subsidized distribution of food, voluntary versus compulsory participation in health activities and the relationship between cost of alternative nutrition intervention models, and the profit rates achieved in the commercial markets.

6.25 The key indicators or proxy variables that will be collected are:

- Infant mortality
- Mortality of children 1 to 4
- Weight and height of children
- Weight and hemoglobin level of pregnant mothers
- Weight at birth
- Frequency of use of health services
- Lactation period
- % of immunization coverage
- Family budgets (sample)
- Cost of health action
- Cost of food
- Administration costs

6.26 Surveys are used to collect information on nutritional and health effects for each of the six models included in the project. These surveys are conducted on the basis of sampling. Two types of sample surveys are used: one on the population at large, and one on the families who benefit from the project. The aim of the former is to collect basic data and to measure the impact of the program on the population at large. A survey was conducted before food distribution starts, and will be repeated annually after the distribution of food (see Forms in Appendix 2). The aim of the second type of survey is to measure the impact of the project on the beneficiary families. A random sample of beneficiaries will be selected. Surveys were conducted at the start, and will be repeated one year after the beginning of the food distribution. The questionnaires for these surveys (see Appendix 2) were designed by the project team. The questionnaires were pretested in June 1977.

6.27 The survey information described above is being collected by 8 interviewers and 1 supervisor. The registration and clinical data is collected by 8 operators and 2 supervisors. Scales and anthropometric techniques are used in the health centers.

6.28 Evaluation of this project component has been contracted out to the Institute of Joacquin Nambuco (IJNB) in Recife.

C. Evaluation of Nutritional Interventions through School-Feeding Network

6.29 The PROAPE component of the Nutrition Project includes tests to determine the nutritional impact and efficiency of feeding pre-schoolers by taking advantage of the existing transport, storage and other facilities of a large ongoing school feeding program. Feeding will be tested among children of low-income families in Pernambuco. The normal channels of the State Department of Education operate the program.

6.30 Pre-schoolers from the age of 4 to 6 years are brought by mothers to the pre-school feeding program centers for feeding and stimulation; nutritional education is also provided to the mothers.

6.31 The purpose of evaluating nutritional interventions through pre-school-feeding are to test the cost-effectiveness of three types of school-feeding: Model A: daily care for 220 days/year of children 4 to 6 years; Model B: care on alternative days for 130 days/year; and Model C: daily care of children 6 years old during the school holiday period of 60 days preceding their entry in the first grade. Only the evaluation of models A and B have so far been considered. Model C will to be treated slightly differently.

6.32 The hypotheses on children in the program are: (i) that they understand and uitlize abstract symbols with greater ease than those of the control group; (ii) that they have a greater capacity for self-expression than those of the control group; (iii) that they display greater social development than those of the control group; (iv) they display greater emotional development than those of the control group; (v) that they display greater physical development in relation to the normal growth (see Appendix 5); and (vi) that they display greater capacity for handling materials than those of the control group.

6.33 To test these hypotheses, information will be collected on: how children understand verbal, graphic, and quantitative symbols; how they express themselves; their capacity to integrate into groups, participate in games, assignments; their knowledge of community standards; their attitude toward stimuli; their handling of commonly used materials associated with formal instruction; and their capacity to execute complex movements. In addition to this, information will be collected on (i) the subsequent performance of children in school, and their physical development through arm circumference and weight/height measurements.

6.34 Table 15 shows the proposed sample design based on (i) a random sample of 10 out of 70 schools, followed by (ii) a random sample of 500 out of 2,800 children from the ten selected schools. Thus, a small sample of 2.5% out of 20,000 children participating in the program, will be selected in a way such that the number of observations by location (Recife and Caruarn) and by age (4, 5, and 6 years) are sufficient to make meaningful extrapolations to the "universe". A similar approach would be used for the selection of a sample of 210 mothers out of 2,800 that are expected to participate in the program.

6.35 A control group will be selected from an area with socio-economic characteristics similar to those of the areas in which school-feeding project is applied 1/. This group will be selected along the same lines a the experimental group. In addition to differentiating between an experimental group (children in the project) and the control group (children not participating in the project), the following sub-classifications will be made: (a) children 6 years old, who drop out of the program one year after it started; (b) children, 5 years old, who drop out two years after the start; and (c) children who drop out at the end of the third year. The scholastic performances of children in the project will be compared with the scholastic performances of children in the control group.

6.36 For the evaluation of the PROAPE component an agreement has been reached between INAN, the Secretariat of Education and the Catholic University of Pernambuco. Under this contract the latter institution is responsible for testing the cognitive, socio-emotional and psychomotor development of the children in the PROAPE project and comparing the results with those of other children who do not benefit from school-feeding and stimulation.

6.37 Test instruments to measure each of the above types of development were developed by a consultant of the University of Brasilia. These instruments were pretested in October 1977 on a sample of 210 children in 4 schools (2 each for models A and B) and a control group (see Table 16). The first results of these pretests were aggregated in January 1978. Preliminary results from the pretesting of the questionnaires on cognitive, socio-emotional and psychomotor development of preschool children indicates that

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1/ In the comparison of the results from the experimental versus the control group, it should be recognized that the behavior of the children can be modified by their attendance at the school and the related interactions.

TABLE 15: SAMPLE DESIGN FOR THE
EVALUATION OF NUTRITION INTERVENTIONS THROUGH SCHOOL FEEDING PROGRAM NETWORK

Models	Number of Schools	Number of Schools in the Sample			Number of Children in the Target Group	Number of Children in the Sample by Location			Number of Children in the Sample by Age and Location								Total	% of Target Group
									Recife				Caruaru					
		Recife	Caruaru	Total		Recife	Caruaru	Total	4 Yes	5 Yes	6 Yes	Sub-Total	4 Yes	5 Yes	6 Yes	Sub-Total		
A	40	3	1	4	8,000	600	200	800	55	40	35	130	30	25	15	70	200	2.5%
B	20	3	1	4	8,000	1,200	400	1,600	55	40	35	130	30	25	15	70	200	2.5%
C	10	2	-	2	4,000	400	-	400	40	33	27	100	-	-	-	100	100	2.5%
TOTAL	70	8	2	10	20,000	2,200	600	2,800	150	113	97	360	60	50	30	240	500	

TABLE 16: DETAILS ON THE DATA COLLECTION

TYPE OF INFORMATION	TYPE OF MEASUREMENT/ SURVEY	EQUIPMENT & INSTRUMENTS	WHO COLLECT INFO.	WHO SUPERVISES INFO. COLLECTION	TIMING OF DATA COLLECTION
PHYSICAL DEVELOPMENT	Measurements of weight, height, and arm circumference	Physiometric scale, record cards	8 teachers	2 supervisors	1977 - May - Nov. 1978 - March - Nov. 1979 - March - Nov.
COGNITIVE, SOCIO-EMOTIONAL, PSYCHOMOTOR DEVELOPMENT	Administration of tests and observation of behavior	Printed tests, child activity materials	6 Psychology trainees	1 Psychologist (SEC)	1977 - May - Nov. 1978 - March - Nov. 1979 - March - Nov.

it may turn out very difficult to prove the difference between the effects of model A and B in the above terms (they are insignificant in the pretest). However, compared with a control group there may be significant differences. These preliminary results probably suggest more about the need for further refinement of the test instruments than about future trends that can be expected in evaluation findings. A psychologist of the Catholic University of Pernambuco suggested that further revisions of these test instruments would be required to make them fully adapted to the children in the PROAPE schools.

6.38 The contract with the Catholic University of Pernambuco for the evaluation of PROAPE foresees that the results from the above tests would be analyzed and tabulated. To find the relative contributions of various inputs into the program (food, stimulation, mother particiaption etc), it would, however, be necessary to construct a simple model which would explain (i) the average differences in physical development of the children by age group, and (ii) the differences in cognitive, socio-emotional and psychomotor development of the children by age group, in function of (iii) the various inputs (food, stimulation program, participation of mothers, duration in the program) and (iv) cost differentials between the models. Such an analysis would be essential to derive policy recommendations from this particular project component.

6.39 The cost for the evaluation of the PROAPE component is estimated at CR$1.5 million or US$93,750. One-third of this would be used for the psychological tests, and one-third of data processing. The rest has been allocated for other costs associated with this effort.

VII. OVERALL EVALUATION OF THE INAN PROJECT

8.1 As indicated above overall evaluation is an analysis of evaluation results from the various components, with a special emphasis on comparisons that can be made across components (e.g. by age group, urban/rural differences etc.). The ultimate objective of overall evaluation of this project is to provide the Government of Brazil with information on the relative cost-effectiveness of nutritional interventions through various delivery systems.

8.2 A proposal for overall evaluation of the INAN project has been prepared by the Foundation and Institute for Economic Research (FEPE) of the University of Sao Paulo. 1/ The approach for overall evaluation basically consists of (a) technical support to the evaluation efforts on each project component; (b) a comparative analysis of evaluation results in order to derive the relative cost-effectiveness of "micro" interventions through school feeding, food subsidy, food technology, rural extension, and credit services, and (c) a comparative analysis of the cost effectiveness of various "macro" policies (agriculture policies, manpower training policies, policies to support agro-industries, etc.). The results from the above, together with the nutritional information from other components would then be used to make specific policy and program recommendations for PRONAN. Figure 3 presents this approach to overall evaluation in a diagram.

8.3 FIPE would provide for the overall evaluation of a multi-disciplinary team consisting of:

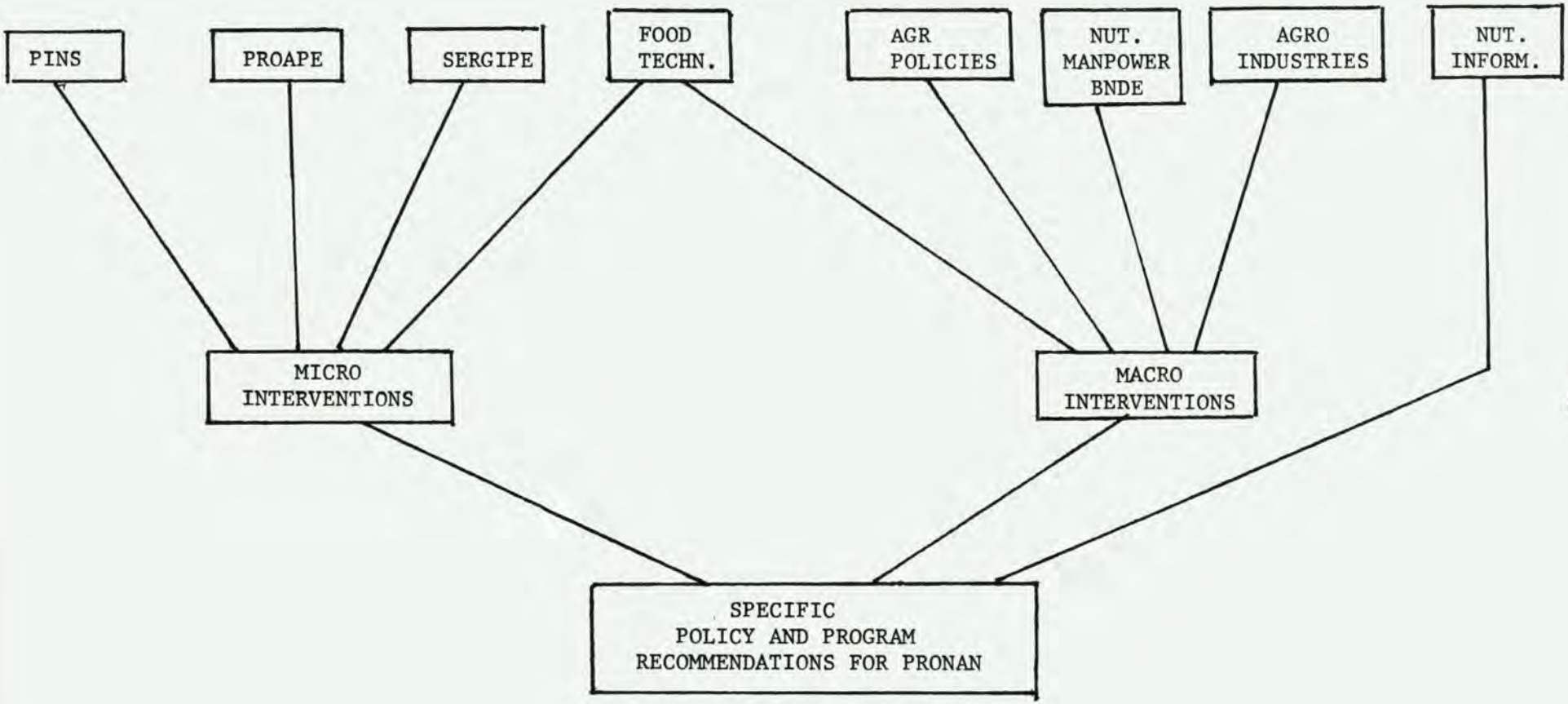
- a nutrition economist
- an agriculture economist
- a rural sociologist
- a project evaluation specialist, and
- a food processing specialist

In addition to this, consultants would be recruited, especially for public health and educational psychology support.

1/ FIPE: "Avaliacao Global do Programa de Nutricao Brasil-IBRD," Anexo 1 do Contracto, Sao Paulo, March 1978.

Figure 3

OVERALL EVALUATION APPROACH



8.4 The total estimated manpower inputs over four years (1978-1981) for the overall evaluation are as follows:

TABLE 17: ESTIMATED MANPOWER ALLOCATIONS FOR OVERALL EVALUATION OF THE INAN PROJECT OVER FOUR YEARS

Personnel Allocations by Project Component	Number of Man-Months Over 4 Years	
	Senior Staff	Junior Staff
Coordinator	20	-
Sergipe Project Component	20	40
PINS Project Component	20	40
PROAPE Project Component	20	40
Food Technology Component	185	37
Macro Interventions	34	34
Consultants	9	-
Total	308	191

8.5 The total cost of the overall evaluation of the Nutrition Research and Development Project has been estimated by FIPE at CR$ 16,660,800 or US$ 1,047,500 (in 1978 prices). A breakdown of these costs is shown in Table 18.

TABLE 18: ESTIMATED COSTS FOR THE OVERALL EVALUATION OF THE INAN PROJECT

(US$ '000)

	1978 1/	1979	1980	1981 2/	Total
Personnel	128.6	220.5	220.5	128.6	698.2
Consultants	7.5	15.0	15.0	7.5	45.0
Travel and Per Diem	18.0	23.3	23.3	18.0	82.6
Data Processing	8.1	16.1	16.1	8.1	48.4
Overhead	32.4	54.9	54.9	31.1	173.3
Total	194.6	329.8	329.8	193.3	1,047.5

1/ April to December 1978
2/ January to July 1981

8.6 The overall evaluation results would be reported as follows: (a) FIPE would produce a detailed methodological report by November 1978; (b) progress reports would be produced in July 1979 and December 1980 and (c) a final evaluation report on the Nutritional Research Development Project would be completed by July 1981.

PLATE I: Increased Government concern about malnutrition and greater awareness of the inadequacies, lack of focus, and coordination of existing programs, led in November 1972 to the establishment of a National Food and Nutrition Institute (INAN) under the Ministry of Health. INAN is responsible for formulating coordinating, monitoring and evaluating nutritional policies and programs in Brazil.

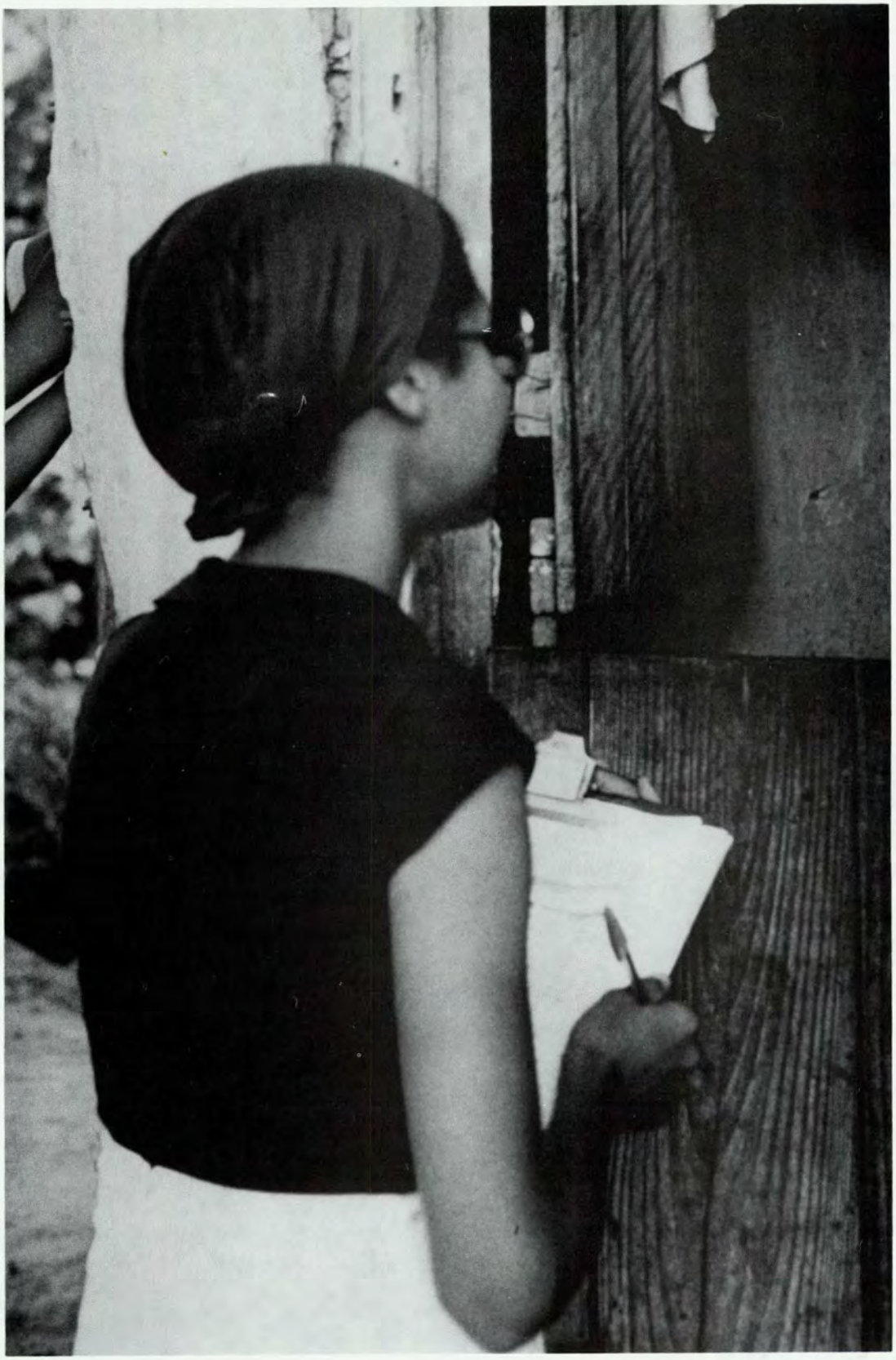


PLATE II: Teams of 4 to 6 enumerators visiting approximately 100 families per day, collect socio-economic information from low-income families living in urban and rural areas in Recife. This information helps to define the target group for nutritional interventions through health services and commercial markets.

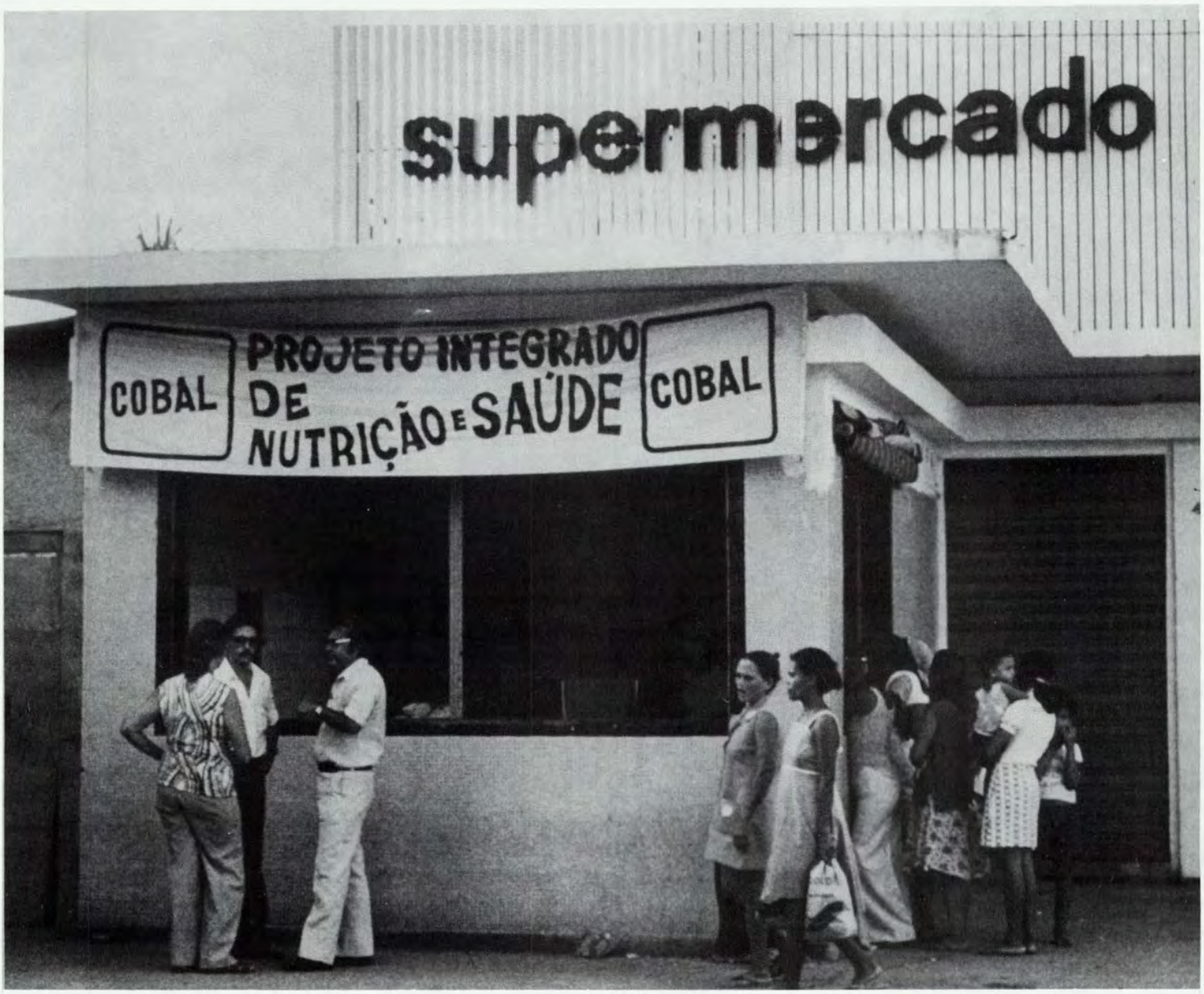


PLATE III: Food coupons, distributed by health staff of a Maternal and Child Health program in Pernambuco, provide 10,000 low-income families in Recife with 30% to 60% subsidy on a food budget consisting of rice, cornmeal, beans and dried milk.

PLATE IV: Families with incomes below two minimum salaries (US$ 108 equivalent) living in urban area of Recife, receive food coupons enabling them to purchase established amounts of food at COBAL markets.

PLATE V: Family of an ATER aid in Sergipe. ATER aids are farmers selected by the community to assist agriculture extension agents. Through intensified agriculture extension services, the productivity and income of some 5,400 farm families in Sergipe will be increased.

PLATE VI: Construction of health mini-post in Sergipe. A total of 30 health mini-posts will be opened. "Orientadores de Saúde" selected by the communities and trained as social extension agents provide basic health and nutrition services to approximately 45,000 persons in Sergipe.

PLATE VII: The nutritional impact and efficiency of feeding pre-schoolers will be tested among 20,000 children of low-income families in Pernambuco.

FORMATS FOR MONITORING

NUTRITIONAL INTERVENTIONS THROUGH

RURAL EXTENSION SERVICES

IN SERGIPE

FORM 1 **AGENT'S DAILY RECORD**

EMATER-SE	OPERATING UNIT	PROJECT	AGENT	DATE

PRODUCT	MUNICIPALITY	TARGET POP.		NO. OF METHODS					TIME (MIN. ½ HOUR)											
															SUPERVISION					
															Regional Coordin.		Coordin. of Study		A	Credit Supvision
		Farmer	Non-Farmer	Visit	Contact	Meeting	Trip	Radio	Preparations	Rural Credit	Tech. Asst.	Travel	Study of Survey	Training	C	E	C	E	C	

FORM 1 (continued)

FARMER'S NAME	PRODUCT	DATA TO BE RECORDED FARMER'S REGISTERED PRODUCTION		
		GOALS/MONITORING INDICATORS	UNIT OF MEASUREMENT	QUANTITY

FORM 2 **TRANSCRIPT OF DAILY RECORD**

EMATER-SE		OPERATING UNIT		PROJECT			PRODUCT		AGENT			MO/YEAR		
Date	MUNICIPALITY	TARGET POP.		NO. OF METHODS					TIME (MIN. ½ HOUR)					
		Farmer	Non-Farmer	Visit	Contract	Meeting	Trip	Radio	Preparation	Rural Credit	Tech. Asst.	Travel	Tech. Upgrading	Survey Taken

FORM 3

TRANSCRIPT OF TECHNICAL UPGRADING RECORD
(Trainging & Supervision)

EMATER-SE	TYPE OF PROJECT/PROGRAM	SUB-REGION	OPERATING UNIT	NAME OF TECHNICIAN	MO.	YR.

DATE	PRODUCT	TECH. UPGRADING (hours)							TOTAL
		TRAINING	SUPERVISION						
			Regional Coord.		Coord. of Study		Monitoring & Control Assistance	Credit Supervision	
			Field	Writing up	Field	Writing up			
TOTAL									

EMATER-SE

FORM 4 **LIST OF ASSISTED FARMERS**

OPERATING UNIT	PERSON IN CHARGE	YEAR
	PROJECT	

No. in order	FARMER'S NAME (LIST EACH ONCE ONLY)	PRODUCT																																	
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D

EMBRATER	FORM 5 PRODUCTION UNIT RECORD EMBRATER VARIABLES			1
2 OPERATING UNIT	3 REGION	4 STARTING DATE OF ATER ON THE PROPERTY	19	MOST COMMON NAME OF ASSISTED FARMER

5 NAME OF FARM OR PROPERTY	6 NAME OF ASSISTED FARMER

7 LOCATION OF PROPERTY	8 NAME OF MUNICIPALITY

9 TOTAL AREA OF PROPERTY		HECTARE	10 LOW INCOME FARMERS	NO. OF CHILDREN	0–5 YRS.		6–14 YRS.	

11 Name of Assisted Project	12 Production System Adopted	13 Starting Date of "Ater" on the Project		14 CROPS			15 ANIMALS			
				YEARLY	PERMANENT		LARGE			SMALL
		Mo.	Yr.	Area Under Cultivation (ha)	Area (ha)	No. of Plants	Total Herd (head)	Grazing Area (ha)	Animal Milk Prod. (liter)	Total Herd (head)

FORM 5 (continued)

PROJECT (Crop)	YEAR	19	YEAR	19	YEAR	19	YEAR	19
	Yield	kg/ha	Yield	kg/ha	Yield	kg/ha	Yield	kg/ha
	Area Harvested (ha)	Production (kg)	Area Harvested (ha)	Production (kg)	Area Harvested (ha)	Production (kg)	Area Harvested (ha)	Production (kg)

FORM 6 **EMATER – SE**

DATA SURVEY TO EVALUATE ATER RESULTS

REGION_____ OPERATING UNIT_____ YEAR_____ MO._____ PRODUCT_____

NAME OF FARMER	NO. OF CHILDREN		Municipality	Total Productive Area	ANIMALS				STARTING DATE OF ATER		BORROWER		Package adopted	PRACTICES ADOPTED*																						No. of Acres	AREA (Ha)		Production	Yield	Comments
														AGRICULTURAL							SOCIAL																			
	0-5 age	6-14 age			Total Herd (head)	Grazing Area (ha)	Animal Milk Producer	Small Animals Total herd (head)	On the Property	On the Project	CN	CAP		1	2	3	4	5	6	7	8	A	B	C	D	E	F	G	H	I	J	L	M	N		Area Under Cultivation	Area Under Harvest	( )	( )	

* AGRICULTURAL

1. Crop Treatments
2. Correct Spacing
3. Seedbed Treatments
4. Lime
5. Chemical Fertilizer
6. Organic
7. Selected Seed or Seedling
8. Pest & Disease Control

* SOCIAL

A. Installed Toilets
B. Residential Drainage
C. No. of Persons Vaccinated
D. Filters Introduced
E. Mother & Child Care
F. Food Selection, Preparation, Consumption & Preservatives
G. Small Livestock Breeding. Increasing of Suckling Period:
H. 0 - 1 Mo.
I. 1-3 Mos.
J. 3-6 Mos.

Production of Malnutrition Incidence

L. 1st Degree
M. 2nd Degree
N. 3rd Degree

FORM 7 **RECORD OF GOALS**

Type of Project/Program	Operating Unit	Sub-Region	Mo.	Yr.

PRODUCT	Officer in Charge
LOW INCOME – INAN	

GOALS/MONITORING INDICATORS	Unit of Measurement	Quantity	
		Per Mo.	Per Yr.
TECHNICAL/EDUCATION ASSISTANCE	xxxxx		
– Assistance to the family	family		
– Farmers assisted by product	xxxxx		
corn	farmers		
beans	farmers		
cotton	farmers		
potatoes	farmers		
Area Planted	xxxxx		
corn	ha		
beans	ha		
cotton	ha		
potatoes	ha		
Production	xxxxx		
corn	t		
beans	t		
cotton	t		
potatoes	t		
– Farmers assisted with marketing	no.		
– Organizations assisted	xxxxx		
farmers associations	no. of members		
farmers' groups	no. of members		
cooperatives	no. of members		
Advance purchase	xxxxx		
direct from the farmer	no./cr$ 1.000		
through cooperatives	no./cr$ 1.000		
– PROAGRO reports	final versions		
– Use of imports:	xxxxx		
plant protection	kg		
seed	kg		
fertilizer	kg		
METRODOLOGY	xxxxx		
– Demonstration fields	no.		
– Demonstration trials	no.		
– Demonstration of results	no.		
– Newspaper forum	no.		

GOALS/MONITORING INDICATORS	Unit of Measurement	Quantity	
		Per Mo.	Per Yr.
HEALTH AND NUTRITION			
– Assisted pregnant women	pregnant women		
– Assisted wetnurses	wetnurses		
– Assisted nursing mothers	nursing mothers		
– Assisted pre-school children	pre-schoolers		
– Improvement of water supply	family		
– Toilets installed	family		
– Trained midwives	no.		
– Persons vaccinated	no.		
– Residential sewerage	family		
– Persons treated for worms	no.		
– Vaccination	children under 5		
– Care of pregnant women registered at the mini-clinic	no.		
– Lengthening of breast feeding period	xxxxx		
0 - 1 mo.	infants		
Up to 3 mos.	infants		
Up to 6 mos.	infants		
– Reduction of malnutrition incidence in children under 5	xxxxx		
1st degree	children		
2nd degree	children		
3rd degree	children		
– Residential gardens	family		
– School	school		
– Installed	family		
– Small livestock raising	family		
– Introduction of residential silos	silo		
– Consumption of:	xxxxx		
beans	kg/family		
corn	kg/family		
SUPPORT ACTIVITIES	xxxxx		
– Installation of health mini-clinics	no.		
– Organized health assn.	no./members		
– Housewives group	no./participants		
– Health workers training	no./participants		
– Health workers upgrading	no./participants		
– Persons treated at mini-clinic	persons		
– Nutritional education	family		
– Monitor training	no./participants		
– Assisted rural school	no.		
– Trained teachers	no.		
– Reformed schools	no.		
– Schools built	no.		

FORMATS FOR MONITORING

NUTRITIONAL INTERVENTIONS THROUGH

HEALTH SERVICES AND COMMERCIAL MARKETS

IN PERNABUCO

FORM 1 **FORMS FOR THE COLLECTION AND RECORDING OF INFORMATION OF INTEGRATED HEALTH SERVICES**

IN–PATIENT ASSESSMENT FORM
DELIVERY/NEWBORN ASSISTANCE

DATA ON MOTHER

01 Unit No. | 02–07 Identification | 08–11 No. Family | 12 13 Age | 14 Origin | 15 Destination

16 Pre-natal | 17 Preganancies | 18 Age | 19–24 Date | 25 Result | 26 No. Dealths

27 Benefit | 28–31 | 32–35 | 36–39 | 40–43

DIAGNOSIS

DATA ON NEWBORN

44 Sex | 45 46 Weight | 47 48 Height | 49 Age | 50–53 | 54–57 | 58 59

DIAGNOSIS

60 Destination

FORM 2

OUT–PATIENT ASSESSMENT FORM
ASSISTANCE TO CHILDREN

01 Unit No. | 02–07 Identification | 08–11 No. Family | 12 13 Age | 14 Sex | 15 Origin | 16 Destination

17–19 Weight | 20–23 | 24–27 | 28–31 | 32–35

DIAGNOSIS

36 Benefit | 37–42 Data | 43 | 44 | 45 | 46 Time | 47 Why

48–53 Vaccines

FORM 3

ANNEX X
MODEL ELIGIBILITY FORM

ELIGIBILITY FORM

No. of Family ☐☐☐☐☐☐☐ No. of Persons ____

Name of Customer _____

_____

Address _____

_____

Where Purchased _____

FOOD PRODUCT:
MILK-SURGAR-RICE-CORNMEAL

Quantities in kg ____ ____ ____ ____

REVALIDATIONS

Valid Thru ___/___ Initials ____		

FORM 4 **INTEGRATED NUTRITION & HEALTH PROJECT**
CISAM/FESP/INAN

FOOD CONSUMPTION SURVEY

City - Block No.

Questionnaire No.

STREET _____ No. _____

DISTRICT _____

REFERENCE POINTS:

DATA OF INTERVIEW:

Day	Mo.	Yr.

LENGTH OF INTERVIEW: From _____

To _____

NAME OF INTERVIEWER: _____

NAME OF HEAD: _____

SOURCE OF INFORMATION: _____

COMMENTS: _____

CONTROL

Supervisor	Criticism	Check	Encoder	Coding Sheet

FORM 4 (continued) **FOOD CONSUMPTION SURVEY**

I- FAMILY COMPOSITION

No. in Order	NAME	Relationship	Sex		Date of Birth or Age	Education							Marital Status				
						Level											
			M	F		Illerate	Literate	Primary	Secondary	Higher	Don't Know	Last Year Completed	Unmarried	Married	Common-law Spouse	Widowed	Divorced, Separated
1		HEAD	1	2		1	2	3	4	5	0		1	2	3	4	5
2			1	2		1	2	3	4	5	0		1	2	3	4	5
3			1	2		1	2	3	4	5	0		1	2	3	4	5
4			1	2		1	2	3	4	5	0		1	2	3	4	5
5			1	2		1	2	3	4	5	0		1	2	3	4	5
6			1	2		1	2	3	4	5	0		1	2	3	4	5
7			1	2		1	2	3	4	5	0		1	2	3	4	5
8			1	2		1	2	3	4	5	0		1	2	3	4	5
9			1	2		1	2	3	4	5	0		1	2	3	4	5
10			1	2		1	2	3	4	5	0		1	2	3	4	5
11			1	2		1	2	3	4	5	0		1	2	3	4	5
12			1	2		1	2	3	4	5	0		1	2	3	4	5
13			1	2		1	2	3	4	5	0		1	2	3	4	5
14			1	2		1	2	3	4	5	0		1	2	3	4	5
15			1	2		1	2	3	4	5	0		1	2	3	4	5

II - JOB

No.	NAME (First Name)	TYPE OF JOB	STYLE OF EMPLOYMENT				Income Received in Preceding Month CR$
			Owner	Employee	Independent	Benificiary	
			1	2	3	4	
			1	2	3	4	
			1	2	3	4	
			1	2	3	4	
						FAMILY INCOME CR$	

III - HOUSING

No. of Rooms	WATER			TOILET		
	PIPED		Other	With Pump	Other	None
	Inside the House	Outside the House				
	1	2	3	1	2	3

FORM 4 (continued) **FOOD CONSUMPTION SURVEY**

IV. PLACE OF BIRTH (Only for Family Head & Wife/Companion)

No., in Order	Status	State	City	Country	How Long Lived in Recife (Yrs.)
	Family Head		1	2	
	Wife		1	2	

V.1 – ONLY FOR PEOPLE WHO WORK

No. in Order	How Long in this Job	Does He/She have a Signed "Carteira"		How many months worked in the past year?											
		Yes	No	1	2	3	4	5	6	7	8	9	10	11	12
		1	2												
		1	2												
		1	2												
		1	2												
		1	2												

V.2 – ONLY FOR PEOPLE WHO ARE NOT WORKING

No.	How Long Unemployed	Reason

VI – What foods does your family not buy but would like to buy?
(List 5 only)

Food	Reason		
	Expensive	Supply	Other
	1	2	
	1	2	
	1	2	
	1	2	
	1	2	

FORM 4 (continued) **FOOD CONSUMPTION SURVEY**

VII – If the following foods cost half their present price, what quantity would your family buy?

	Powered Milk 301		Rice 101		Cornmeal 104		Sugar 701	
	Current Price	Half Price	Current Price	Half Price	Current Price	Half Price	Current Price	Half Price
Quantity								

Powered Milk – Kg. Rice – Kg. Cornmeal – Kg. Sugar – Kg.

OBS.: SPECIFY TIME UNIT (PER WEEK, PER MONTH).

VIII – PURCHASING HABITS

Over the past month, how much did your family spend in the following places?

	PLACE WHERE THE FAMILY SHOPPED	CR$	
		Per Week	Per Month
01	fair		
02	supermarket		
03	stores, grocery shops		
04	bakery or bread and milk supplies		
05	butcher's shop		
06	green grocery, wineshop		
07	market		
08	fish monger's or scales		
09	street vendor		
10	TOTAL_____CR$		

FORM 4 (continued) **FOOD CONSUMPTION**

Product Code	PRODUCT	Standard Unit	Alternative Unit	Quantity of Product Bought		Quantity Received as Gift, or Own Production in Past Month	Price of Product when Last Purchased CR$	Total Expenditure for the Month CR$
				Per Week	Per Month			
1 CEREALS ETC.								
101	rice	Kg						
102	cassava flour	Kg						
103	beans	Kg						
104	cornmeal	Kg						
105	cornstarch	Kg						
106	wheat flour	Kg						
	other _____							
	other _____							
	other _____							
							SUB - TOTAL CR$	
2 MEAT & FISH								
201	beef bone in	Kg						
202	beef boneless	Kg						
203	jerky	Kg						
204	chicken	Kg						
205	dried codfish	Kg						
206	fish	Kg						
207	shrimp	Kg						
208	pork	Kg						
209	canned meat	Kg						
210	offal & visceras	Kg						
	other _____							
	other _____							
	other _____							
	other _____							
							SUB - TOTAL CR$	
3 DAIRY PRODUCTS & EGGS								
301	full powdered milk	Kg						
302	milk	litro						
303	butter	Kg						
304	cheese	Kg						

FORM 4 (continued) **FOOD CONSUMPTION**

Product Code	PRODUCT	Standard Unit	Alternative Unit	Quantity of Product Bought		Quantity Received as Gift, or Own Production in Past Month	Price of Product when Last Purchased CR$	Total Expenditure for the Month CR$
				Per Week	Per Month			
305	chicken's eggs	Unit						
	other _____							
	other _____							
	other _____							
							SUB - TOTAL CR$	
4 BREAD & PASTA ETC.								
401	french bread	Unit						
402	macaroni	Kg						
403	cookies, crackers	Kg						
	other _____							
	other _____							
	other _____							
							SUB - TOTAL CR$	
5 VEGETABLES								
501	lettuce	pé						
502	cabbage	Kg						
503	pumpkin	Kg						
504	pearl onions	Bunch						
505	yams	Kg						
506	aipi cassava	Kg						
507	tomatoes	Kg						
508	carrots	Kg						
509	okra	Unit						
510	gherkin	Unit						
511	coriander	Bunch						
512	green corn	Ear						
513	onions	Kg						
514	garlic	Bulb						
515	red peppers	Unit						
516	chicken	Unit						
517	irish potatoes	Kg						
518	sweet potatoes	Kg						

FORM 4 (continued) **FOOD CONSUMPTION**

Product Code	PRODUCT	Standard Unit	Alternative Unit	Quantity of Product Bought		Quantity Received as Gift, or Own Production in Past Month	Price of Product when Last Purchased CR$	Total Expenditure for the Month CR$
				Per Week	Per Month			
519	green beans	Kg						
	Other_____							
	Other_____							
	Other_____							
							SUB - TOTAL CR$	
6 FRUIT								
601	banana prata	One						
602	oranges	One						
603	palm nuts	One						
604	pineapples	One						
605	lemons	One						
606	mangoes	One						
607	avocado	One						
608	passionfruit	One						
609	cashew	One						
610	papaya	One						
611	jaca	Kg						
612	watermelon	Kg						
	other_____							
	other_____							
	other_____							
							SUB - TOTAL CR$	
7 PROCESSED PRODUCTS								
701	sugar	Kg						
702	coffee	Kg						
703	salt	Kg						
704	margarine	Kg						
705	cottonseed oil	Can						
706	soybean oil	Can						
707	other oil	Can						
708	tomatoe extract	Kg						
709	vinegar	Litro						

FORM 4 (continued) **FOOD CONSUMPTION**

Product Code	PRODUCT	Standard Unit	Alternative Unit	Quantity of Product Bought		Quantity Received as Gift, or Own Production in Past Month	Price of Product when Last Purchased CR$	Total Expenditure for the Month CR$
				Per Week	Per Month			
710	dry seasonings	Kg						
711	candy	Kg						
712	lard	Kg						
713	bologna, salami, etc.	Kg						
714	sardines	Kg						
	other _____							
	other _____							
	other _____							
							SUB - TOTAL CR$	
8 PROCESSED PRODUCTS FOR CHILDREN								
801	rice flour	Kg						
802	can eniched chocolate	Can						
803	"mucilon"	can						
804	"Neston"	Can						
805	modified milk	can						
806	powdered milk	Can						
807	oatmeal	can						
	other _____							
	other _____							
	other _____							
							SUB - TOTAL CR$	

FORM 4 (continued) **FOOD CONSUMPTION**

X - HOUSING EXPENSES

Your house is:

rented	1
owned	2
assigned	3
being purchased	4

List expenses over the past month related to:

Code	Type	CR$
1	rent	
2	house installment	
3	light	
4	water	
5	gas	
6	wood, charcoal	
7	soap, cleaning	
8	TOTAL	

XI - SMOKING & BEVERAGES (monthly expenses)

Code	Type	CR$
1	cigarette	
2	watches	
3	cold drinks	
4	beer	
5	"aguardente", "pinga"	
6	other_____	
7	TOTAL	

FORM 4 (continued) **FOOD CONSUMPTION**

XII - OTHER MONTHLY EXPENSES

Type	CR$
Transportation: bus, car, train	
education	
doctors	
pharmacy	
dentist	
clothing (clothes & shoes)	
personal services (barber, hairdresser)	
expenses on personal hygiene items	
other expenses	
installments (specify)	
TOTAL	

XIII - EXPENSES ON FOOD CONSUMED AWAY FROM HOME

Has any resident eaten out over the past month?

No. in Order	Name	Meal (lunch or dinner)				Quick Snacks			
		At Place of Work	Else where	No. of Days	Amount CR$	At Place of Work	Else-where	No. of Days	Amount CR$
	TOTAL								

XIV - OTHER INCOME AND EXPENSES

Did your family receive money from or send money to another person (relative or not) over the past month?

Received: CR$ _____

Sent: CR$ _____

FORM 4 (continued) **FOOD CONSUMPTION**

XV - YOUR FAMILY HAS:

Code	Item	Yes	No
01	dishware	1	2
02	car	1	2
03	cooking pots	1	2
04	bicycle	1	2
05	cutlery	1	2
06	electric iron	1	2
07	water filter	1	2
08	burning stove	1	2
09	gas stove	1	2
10	ice box	1	2
11	blender	1	2
12	sewing machine	1	2
13	radio	1	2
14	portable radio	1	2
15	phonograph	1	2
16	T.V.	1	2
17	charcoal iron	1	2

APPENDIX 3

CHECK LIST OF QUESTIONS

FOR THE DESIGN OF AN EVALUATION SYSTEM

APPENDIX 3

CHECK LIST OF QUESTIONS FOR THE DESIGN OF AN EVALUATION SYSTEM

A. USERS AND PURPOSES

- Who are the potential users of the evaluation results?
- What are the purposes of evaluation?
- What specific hypotheses need to be tested?

B. INFORMATION COLLECTION SYSTEM

- What are the key indicators or proxy variables that need to be collected to test these hypotheses?
- What types of information collection can be used (specify for each indicator or proxy variable; for objective quantitative and subjective qualitative information)?
- If a survey will be used, what sampling method is proposed?
- How will the sample be selected?
- How often will the survey be conducted (frequency of sampling survey)?
- What will be the sample size (as a percentage of the total number of beneficiaries and of the beneficiaries in each strata)?
- Will information be collected on a "control" group? How will the control group be selected? What will be the size of the control group?
- What instrument(s) of data collection or questionnaire(s) will be used?
- Who is responsible for the design of the questionnaires? Make sure the questionnaire will be coded? When and where will the questionnaire(s) be pretested?
- Who will collect the information and do the initial data clearing and tabulation (specify number of enumerators, supervisory staff, coders, tabulators, editors, etc.)?
- What logistics will be required?

C. INFORMATION PROCESSING AND TABULATION

- Who will be responsible for processing and tabulation of the information (clerks, assistant statisticians, statisticians, etc.)?
- What data processing techniques will be used?
- How long will processing and tabulation take? When will the information be ready for analysis?

D. INFORMATION ANALYSIS

- Who will be responsible for information analysis?
- Which analysis techniques will be used?
- When will the results from the analysis be available?

E. REPORTING OF EVALUATION RESULTS

- To whom should the evaluation results be communicated?
- How will evaluation results be communicated (e.g., meetings, reports, etc.)?
- What types of reports will be produced and with what frequency will they be delivered?

APPENDIX 4

QUESTIONNAIRES FOR THE

EVALUATION OF

NUTRITIONAL INTERVENTIONS THROUGH

RURAL EXTENSION SERVICES

IN SERGIPE

EXPERIMENTAL PROJECT: FOOD PRODUCTION

AND IMPROVEMENT OF NUTRITIONAL CONDITIONS

IN LOW-INCOME AREAS IN SERGIPE

Questionnaire for Evaluation

1. Identification of Questionnaire _____

2. Name of Interviewee _____

3. Category
   - Owner _____
   - Owner/Tenant _____
   - Owner/Sharecropper _____
   - Tenant _____
   - Sharecropper _____
   - Sharecropper/Tenant _____
   - Owner/Tenant/Sharecropper _____

4. Total Area of Property _____

5. Name of Place: _____

6. Municipality: _____ District: _____

7. Street: _____

8. Date of Interview: _____

9. Interviewer: _____

10. Checked by: _____ Date: _____

Agricultural Production, Year 19__/19__.

I. Resources

1.1 Land

1.	Area of Property	1 __ __,__ __
2.	Area Rented from Others	5 __ __,__ __
3.	Area Sharecropped for Others	9 __ __,__ __
4.	Area Rented to Others	13 __ __,__ __
5.	Area Sharecropped by Others	17 __ __,__ __
6.	Total Cultivated Area	21 __ __,__ __

1.2 Changes to Machinery & Equipment, Improvements

. In 19__/__ , did you build any improvements? 25 __

. If so, specify type(s) and cost (in Cr$1,000)

. _____ 26 __ __ 28 __ __ __,__

. _____ 32 __ __ 34 __ __ __,__

. _____ 38 __ __ 40 __ __ __,__

. Was any improvement destroyed?

. _____ 44 __ __ 46 __ __ __,__

. _____ 50 __ __ 52 __ __ __,__

. _____ 56 __ __ 58 __ __ __,__

Did you buy any new machinery and/or equipment?

(in Cr$1,000)

. _____ 1 __ __ 3 __ __ __,__

. _____ 7 __ __ 9 __ __ __,__

. _____ 13 __ __ 15 __ __ __,__

. _____ 19 __ __ 21 __ __ __,__

Did you sell and/or lose machinery or equipment?

. _____ 25 __ __ 27 __ __ __,__

. _____ 31 __ __ 33 __ __ __,__

1.3 Available family labor:

. adults - male No. 37 __ __

Days available 39 __ __ __ __

. adults - female No. 43 __ __

Days available 45 __ __ __ __

. children No. 49 __ __

Days available 51 __ __ __ __

. Total available family labor:

Man-days 51 __ __ __ __ __,__

1.3 Available labor:

Permanent (sharecroppers, tenants, paid labor)

. adults - male	No.		1 __ __
	Days available	3 __ __ __ __	
. adults - female	No.		7 __ __
	Days available	9 __ __ __ __	
. children	No.		13 __ __
	Days available	15 __ __ __ __	
. Total available permanent labor:			
	Man-days	19 __ __ __ __ __,__	
. Total available labor:			
	Man-days	25 __ __ __ __ __ __,__	

1.4 Inventory of draft and production animals:

1.	Draft animals (no. & value)	1 __ __	3 __ __ __ __ __ __
2.	Cows (no. & value)	9 __ __	11 __ __ __ __ __ __
3.	Bulls & steers (no. & value)	17 __ __	3 __ __ __ __ __ __
4.	Bullocks, heifers (no. & value)	25 __ __	27 __ __ __ __ __ __
5.	Calves (no. & value)	33 __ __	35 __ __ __ __ __ __
6.	Poultry (no. & value)	41 __ __	44 __ __ __ __ __ __
7.	Pigs (no. & value)	50 __ __	52 __ __ __ __ __ __
8.	Goats & sheep (no. & value)	58 __ __	60 __ __ __ __ __ __

2.2 Distributor of Production

Cotton

Quantity consumed 56 __ __,__

Quantity sold 59 __ __ __

To whom _____ 62 __ __

Cassava

Quantity consumed (ton) 1 __ __,__ __

Quantity sold (ton) 5 __ __ __,__ __

To whom _____ 10 __ __

Castor oil plant

Quantity consumed ( ) 12 __ __ __,__

Quantity sold ( ) 16 __ __ __,__

To whom _____ 20 __ __

Other Products (specify)

• _____ 22 __

Quantity consumed ( ) 23 __ __ __,__

Quantity sold ( ) 27 __ __ __,__

To whom _____ 31 __ __

• _____ 33 __

Quantity consumed ( ) 34 __ __ __,__

Quantity sold ( ) 38 __ __ __,__

To whom _____ 42 __ __

• _____ 44 __

Quantity consumed ( ) 45 __ __,__

Quantity sold ( ) 48 __ __,__

To whom _____ 51 __ __

2.3 Livestock Sold & Consumed over the Year

- Cattle

  Quantity consumed (head) 1 __ __

  Quantity sold (head) 3 __ __ __

  Unit price ($) 6 __ __ __ __

  To whom _____ 10 __ __

- Pigs

  Quantity consumed 12 __ __ __

  Quantity sold 15 __ __ __ __

  Unit price ($) 19 __ __ __ __

  To whom _____ 23 __ __

- Poultry

  Quantity consumed 25 __ __ __

  Quantity sold 28 __ __ __ __

  Unit price ($) 32 __ __ __

  To whom _____ 35 __ __

- Draft animals

  Quantity sold (head) 37 __ __

  Unit price ($) 39 __ __ __ __

  To whom _____ 43 __ __

- Goats & Sheep

  Quantity consumed 45 __ __

  Quantity sold 47 __ __ __

  Unit price ($) 50 __ __ __ __

  To whom _____ 54 __ __

2.3 Livestock Sold & Consumed over the Year

. Milk

Quantity consumed (liters/day) 1 __ __

Quantity sold (liters/day) 3 __ __ __

Unit price ($/liter) 6 __,__ __

To whom _____ 9 __ __

. Dairy products (cheese, butter)

Total value consumed/year 11 __ __ __ __

Total value sales/year 15 __ __ __ __ __

To whom _____ 20 __ __

2.4 Livestock Purchases over the Year

1. Draft animals (No. & price) 22 __ __ 24 __ __ __ __ __
2. Cows (No. & price) 29 __ __ 31 __ __ __ __ __
3. Steers & bulls (No. & price) 36 __ __ 38 __ __ __ __ __
4. Bullocks, heifers (No. & price) 43 __ __ 45 __ __ __ __ __
5. Calves (No. & price) 50 __ __ 52 __ __ __ __ __
6. Pigs (No. & price) 57 __ __ 59 __ __ __ __ __
7. Goats & sheep (No. & price) 64 __ __ 66 __ __ __ __ __

III. Crops

3.1 Technology & Inputs Used During the Agricultural Year

Maize

Mixed Cropping (1) Single Crop (2) Both (3) 1 __

. Chemical Fertilizer ($) 2 __ __ __ __ __

. Organic Fertilizer ($) 7 __ __ __ __ __

. Selected Seed ($) 12 __ __ __ __

. Insecticides, fungicides ($) 16 __ __ __ __

. Labor-service: man-days 20 __ __ __ __

service: woman-days 24 __ __ __ __

service: child-days 28 __ __ __ __

. Service: animal-days 32 __ __ __

Beans

Mixed Cropping (1) Single Crop (2) Both (3) 35 __

. Chemical Fertilizer ($) 36 __ __ __ __ __

. Organic Fertilizer ($) 41 __ __ __ __ __

. Selected Seed ($) 46 __ __ __ __

. Insecticides, fungicides ($) 50 __ __ __ __

. Labor-service: man-days 54 __ __ __ __

service: woman-days 58 __ __ __ __

service: child-days 62 __ __ __ __

. Service: animal-days 66 __ __ __

3.1 Technology & Inputs Used During the Agricultural Year

Cotton

Mixed Cropping (1) Single Crop (2) Both (3) 1 __

. Chemical Fertilizer ($) 2 __ __ __ __ __

. Organic Fertilizer ($) 7 __ __ __ __ __

. Selected Seed ($) 12 __ __ __ __

. Insecticides, fungicides ($) 16 __ __ __ __

. Labor-service: man-days 20 __ __ __ __

service: woman-days 24 __ __ __ __

service: child-days 28 __ __ __ __

. Service: animal-days 32 __ __ __

Cassava

Mixed Cropping (1) Single Crop (2) Both (3) 35 __

. Chemical Fertilizer ($) 36 __ __ __ __ __

. Organic Fertilizer ($) 41 __ __ __ __ __

. Selected Seed ($) 46 __ __ __ __

. Insecticides, fungicides ($) 50 __ __ __ __

. Labor-service: man-days 54 __ __ __ __

service: woman-days 58 __ __ __ __

service: child-days 62 __ __ __ __

. Service: animal-days 66 __ __ __

3.1 Technology & Inputs Used During

the Agricultural Year

Castor oil plant

Mixed Cropping (1) Single Crop (2) Both (3) 1 __

. Chemical Fertilizer ($) 2 __ __ __ __ __

. Organic Fertilizer ($) 7 __ __ __ __ __

. Selected Seed ($) 12 __ __ __ __

. Insecticides, fungicides ($) 16 __ __ __ __

. Labor-service: man-days 20 __ __ __ __

service: woman-days 24 __ __ __ __

service: child-days 28 __ __ __ __

. Service: animal-days 32 __ __ __

Other

(specify) 35 __

Mixed Cropping (1) Single Crop (2) Both (3) 36 __

. Chemical Fertilizer ($) 37 __ __ __ __ __

. Organic Fertilizer ($) 42 __ __ __ __ __

. Selected Seed ($) 47 __ __ __ __

. Insecticides, fungicides ($) 51 __ __ __ __

. Labor-service: man-days 55 __ __ __ __

service: woman-days 59 __ __ __ __

service: child-days 63 __ __ __ __

. Service: animal-days 67 __ __ __

3.1 Technology & Inputs Used During the Agricultural Year

Other

(Specify) _____ 1 __

Mixed Cropping (1) Single Crop (2) Both (3) 2 __

. Chemical Fertilizer ($) 3 __ __ __ __ __

. Organic Fertilizer ($) 8 __ __ __ __ __

. Selected Seed ($) 13 __ __ __ __

. Insecticides, fungicides ($) 17 __ __ __ __

. Labor-service: man-days 21 __ __ __ __

service: woman-days 25 __ __ __ __

service: child-days 29 __ __ __ __

. Service: animal-days 33 __ __ __

Other

(Specify) _____ 36 __

Mixed Cropping (1) Single Crop (2) Both (3) 37 __

. Chemical Fertilizer ($) 38 __ __ __ __ __

. Organic Fertilizer ($) 43 __ __ __ __ __

. Selected Seed ($) 48 __ __ __ __

. Insecticides, fungicides ($) 52 __ __ __ __

. Labor-service: man-days 56 __ __ __ __

service: woman-days 60 __ __ __ __

service: child-days 64 __ __ __ __

. Service: animal-days 68 __ __ __

3.1 Technology & Inputs Used During the Agricultural Year

Cattle

. Vaccines & medications ($)	1 __ __ __ __
. Feed & supplements ($)	5 __ __ __ __ __
. Labor (services - men)	10 __ __ __ __
(services - women)	14 __ __ __ __
(services - children)	18 __ __ __ __

Pigs

. Vaccines & medications ($)	22 __ __ __ __
. Feed & supplements ($)	26 __ __ __ __ __
. Labor (services - men)	31 __ __ __ __
(services - women)	35 __ __ __ __
(services - children)	39 __ __ __ __

Poultry

. Vaccines & medications ($)	43 __ __ __ __
. Feed & supplements ($)	47 __ __ __ __ __
. Labor (services - men)	52 __ __ __ __
(services - women)	56 __ __ __ __
(services - children)	60 __ __ __ __

3.2 Livestock: Technology & Inputs Used Over the Agricultural Year

Others

(Specify) _____ 1 __

. Vaccines & medications ($) 2 __ __ __ __

. Feed & supplements ($) 6 __ __ __ __ __

. Labor (services - men) 11 __ __ __ __

(services - women) 15 __ __ __ __

(services - children) 19 __ __ __ __

Others

(Specify) _____ 23 __

. Vaccines & medications ($) 24 __ __ __ __

. Feed & supplements ($) 28 __ __ __ __ __

. Labor (services - men) 33 __ __ __ __

(services - women) 37 __ __ __ __

(services - children) 41 __ __ __ __

3.3 Use of Hired Labor (if any)

No. of persons 45 __ __

Total service 47 __ __ __ __

Wages ($/day) 51 __ __,__

IV. Advance Purchase of Production

Product: Maize (total in Cr$1,000) 54 __ __ __,__

Beans (total in Cr$1,000) 58 __ __ __,__

Cotton (total in Cr$1,000) 62 __ __ __,__

Castor oil plant (total in Cr$1,000) 66 __ __ __,__

IV. Advance Purchase of Production

Others (specify)

. _____ 1 __

. (total in Cr$1,000) 2 __ __ __ __,__

Others (specify)

. _____ 7 __

. (total in Cr$1,000) 8 __ __ __ __,__

Others (specify)

. _____ 13 __

. (total in Cr$1,000) 14 __ __ __ __,__

1. Of the products you sold in advance, which went to COBAL?

Maize (Yes 1, No 2) 19 __

Beans (Yes 1, No 2) 20 __

Cotton

Castor oil plant

Others _____ 21 __
(Yes 1, No 2) 22 __

Others _____ 23 __
(Yes 1, No 2) 24 __

Others _____ 25 __
(Yes 1, No 2) 26 __

V. Credit Received in 19__/__

Banco do Brasil (Amount & Technical Assistance) 27 __ __ __ __ __ 32 __

Banco do Estado (Amount & Technical Assistance) 33 __ __ __ __ __ 38 __

BNB (Amount & Technical Assistance) 39 __ __ __ __ __ 44 __

Commercial Banks (Amount & Technical Assistance) 45 __ __ __ __ __ 50 __

Private Individuals (Amount & Technical Assistance) 51 __ __ __ __ __ 56 __

VI. Technical Assistance & Cooperatives

1. Do you belong to any EMATER-Se farmers' group? (Yes 1, No 2) 1 __

2. No. of visits received during the year

. From the extension worker 2 __ __

. From the ATER worker 4 __ __

3. No. of visits to the extension worker's office 6 __ __

4. Are you a member of a cooperative? (Yes 1, No 2) 8 __

. Specify _____ 9 __

VII. Work outside the property, and other income

Agricultural

. Type of work _____ 10 __

. No. of persons 11 __ __

. No. of days (total) 13 __ __ __

. Total income ($) 16 __ __ __ __ __

. Type of work _____ 21 __

. No. of persons 22 __ __

. No. of days (total) 24 __ __ __

. Total income ($) 27 __ __ __ __ __

Non-agricultural

. Type of work _____ 32 __

. No. of persons 33 __ __

. No. of days (total) 35 __ __ __

. Total income ($) 38 __ __ __ __ __

. Type of work _____ 43 __

. No. of persons 44 __ __

. No. of days (total) 46 __ __ __

. Total income ($) 49 __ __ __ __ __

Other receipts

Total amount ($) 54 __ __ __ __ __

VIII. Rental

Payment

. Form of payment

_____ 1 __

. Equivalent in Cr$ 2 __ __ __ __ __ __

. Form of payment

_____ 8 __

. Equivalent in Cr$ 9 __ __ __ __ __ __

Received

. Form of payment

_____ 15 __

. Equivalent in Cr$ 16 __ __ __ __ __ __

. Form of payment

_____ 22 __

. Equivalent in Cr$ 23 __ __ __ __ __ __

IX. Sharecropping

Maize (Yes 1, No 2, Type) 29 __ 30 __

Beans (Yes 1, No 2, Type) 31 __ 32 __

Cotton (Yes 1, No 2, Type) 33 __ 34 __

Castor oil plant (Yes 1, No 2, Type) 35 __ 36 __

Cassava (Yes 1, No 2, Type) 37 __ 38 __

Others _____ 39 __

(Yes 1, No 2, Type) 40 __ 41 __

Others _____ 42 __

(Yes 1, No 2, Type) 43 __ 44 __

I. Land Use

Crops (tarefa, ha)	1 __ __ __	4 __ __,__
Grazing (tarefa, ha)	7 __ __ __	10 __ __,__
Chicken crops (tarefa, ha)	13 __ __ __	16 __ __,__
Natural forest (tarefa, ha)	19 __ __ __	22 __ __,__
Improved area (tarefa, ha)	25 __ __ __	28 __ __,__
Unsuitable (tarefa, ha)	31 __ __ __	34 __ __,__
Unused (tarefa, ha)	37 __ __ __	40 __ __,__
TOTAL	43 __ __ __ __	47 __ __,__

Value of Land

With improvements ($/tarefa)	50 __ __ __ __,__
($/ha)	55 __ __ __ __,__
Without improvements ($/tarefa)	60 __ __ __ __,__
($/ha)	65 __ __ __ __,__

CAPITAL INVESTED IN EQUIPMENT

Equipment	Quantity 1	Present Value 2	Future Life 3	Cost of New Unit 4	Total Life 5
Disc plow					
Moldboard plow					
Harrow					
Furrower					
Fertilizer spreader					
Planter					
Cultivator					
Sprayer					
Duster					
Stumper					
Irrigation works					
Motors					
Milking machine					
Milk cans					
Milk buckets					
Grinder					
Feed mixer					
Pickax					
Shredder					
Tractor					
Jeep					
Truck					
Wheelbarrow					
Carts					
Ox-cart					
Harness, trappings					
Tools					

CAPITAL INVESTED IN IMPROVEMENTS

Improvements	Unit 1	Quantity 2	Type M-A-C	Present Value	Future Life	Cost of New Unit	Total Duration
Main farm house							
Tenant farmers's house							
Cow barn							
Corral							
Inoculation pens							
Covered shelters							
Covered troughs							
Cattle dipping trough							
Manure heap							
Fences							
Calving, lambing, shed							
Silos							
Granaries							
Storehouses							
Processing machines							
Storage							
Barn							
Third parties							
Dam							
Power plant							
Fences							
Intermediate roads							

NUTRITION SURVEY QUESTIONNAIRE

Name of head of family _____

Name of interviewee _____

Municipality _____

Name of property _____

Location of property _____

Interviewer _____

Date of interview _____

Review _____ Date _____

Comments: _____

_____

_____

I. Anthropometric Measurements by Sex & Age
0 - 6 years

1. 1st child _____

Sex (masc 1, fem. 2)	1 __
Age (months)	2 __ __
Wt (kg & g)	4 __ __,__ __ __
Ht (cm & mm)	9 __ __ __,__
Arm circumference	13 __ __,__
Edema (Yes 1, No 2)	16 __

2. 2nd child _____

Sex (masc 1, fem. 2)	17 __
Age (months)	18 __ __
Wt (kg & g)	20 __ __,__ __ __
Ht (cm & mm)	25 __ __ __,__
Arm circumference	29 __ __,__
Edema (Yes 1, No 2)	32 __

3. 3rd child _____

Sex (masc 1, fem. 2)	33 __
Age (months)	34 __ __
Wt (kg & g)	36 __ __,__ __ __
Ht (cm & mm)	41 __ __ __,__
Arm circumference	45 __ __,__
Edema (Yes 1, No 2)	48 __

4. 4th child _____

Sex (masc 1, fem. 2)	49 __
Age (months)	50 __ __
Wt (kg & g)	52 __ __,__ __ __
Ht (cm & mm)	57 __ __ __,__
Arm circumference	61 __ __,__
Edema (Yes 1, No 2)	64 __

I. Anthropometric Measurements by Sex & Age
0 - 6 years

5. 1st child _____

Sex (masc 1, fem. 2)	1 __
Age (months)	2 __ __
Wt (kg & g)	4 __ __,__ __ __
Ht (cm & mm)	9 __ __ __,__
Arm circumference	13 __ __,__
Edema (Yes 1, No 2)	16 __

6. 2nd child _____

Sex (masc 1, fem. 2)	17 __
Age (months)	18 __ __
Wt (kg & g)	20 __ __,__ __ __
Ht (cm & mm)	25 __ __ __,__
Arm circumference	29 __ __,__
Edema (Yes 1, No 2)	32 __
Total no. of children under 6	33 __ __

II. Breastfeeding (children under 5)

1. Are you currently breastfeeding any of your children? (Yes 1, No 2, More than one child 3) 35 __

36 __

2. What foods do you give your children once they are weaned?

1.	Flour ____ w. water	38 __
2.	Flour ____ w. milk	39 __
3.	Mashed beans	40 __
4.	Rice	41 __
5.	Vegetable soup	42 __
6.	Fruit	43 __
7.	Meat, fish on eggs	44 __
8.	_____	45 __
9.	_____	46 __
10.	_____	47 __

3. At how many months does the child start on adult food? 48 __

II. Consumption of Foodstuffs - 1-Day Record

1. Cereals & by-products

Rice	Net Wt (g)	1 __ __ __ __
	Unit Cost ($/kg)	5 __ __,__ __
	Origin	9 __
Cornmeal	Net Wt (g)	10 __ __ __ __
	Unit Cost ($/kg)	14 __ __,__ __
	Origin	18 __
Wheat flour	Net Wt (g)	19 __ __ __ __
	Unit Cost ($/kg)	23 __ __,__ __
	Origin	27 __
Bread, cookies, crackers	Net Wt (g)	28 __ __ __ __
	Unit Cost ($/kg)	32 __ __,__ __
	Origin	36 __
Pasta (macaroni, noodles, etc)	Net Wt (g)	37 __ __ __ __
	Unit Cost ($/kg)	41 __ __,__ __
	Origin	45 __
Corn by-products (cornstarch, "canjiquinha")	Net Wt (g)	46 __ __ __ __
	Unit Cost ($/kg)	50 __ __,__ __
	Origin	54 __

2. Tuberous Roots, Cassava

	Gross Wt (g)	1 __ __ __ __
	Net Wt (g)	5 __ __ __ __
	Unit Cost ($/kg)	9 __ __,__ __
	Origin	13 __

Sweet potatoes, yams, "cara"

	Gross Wt (g)	14 __ __ __ __
	Net Wt (g)	18 __ __ __ __
	Unit Cost ($/kg)	22 __ __,__ __
	Origin	26 __

Irish potato

	Gross Wt (g)	27 __ __ __ __
	Net Wt (g)	31 __ __ __ __
	Unit Cost ($/kg)	35 __ __,__ __
	Origin	39 __

Cassava meal, tapioca

	Net Wt (g)	40 __ __ __ __
	Unit Cost ($/kg)	44 __ __,__ __
	Origin	48 __

3. Sugars

Sugar in general

	Net Wt (g)	49 __ __ __ __
	Unit Cost ($/kg)	53 __ __,__ __
	Origin	57 __

Candies

	Net Wt (g)	58 __ __ __ __
	Unit Cost ($/kg)	62 __ __,__ __
	Origin	66 __

4. Legumes & Oil plants
String Beans

Gross Wt (g)	1	__ __ __ __
Net Wt (g)	5	__ __ __ __
Unit Cost ($/kg)	9	__ __,__ __
Origin	13	__

Other beans (specify)

_____ 14 __

Gross Wt (g)	15	__ __ __ __
Net Wt (g)	19	__ __ __ __
Unit Cost ($/kg)	23	__ __,__ __
Origin	27	__

Oils & Fats
Oil

Net Wt (g)	28	__ __ __ __
Unit Cost ($/kg)	32	__ __,__ __
Origin	36	__

Animal fat (specify)

_____ 37 __

Net Wt (g)	38	__ __ __ __
Unit Cost ($/kg)	42	__ __,__ __
Origin	46	__

Margarine & Butter

Net Wt (g)	47	__ __ __ __
Unit Cost ($/kg)	51	__ __,__ __
Origin	55	__

6. Vegetables

Pumpkins, summer squash

Gross Wt (g)	1 __ __ __ __
Net Wt (g)	5 __ __ __ __
Unit Cost ($/kg)	9 __ __,__ __
Origin	13 __

Gherkins, okra

Gross Wt (g)	14 __ __ __ __
Net Wt (g)	18 __ __ __ __
Unit Cost ($/kg)	22 __ __,__ __
Origin	26 __

Green corn

Gross Wt (g)	27 __ __ __ __
Net Wt (g)	31 __ __ __ __
Unit Cost ($/kg)	35 __ __,__ __
Origin	39 __

Meat, cabbage

Gross Wt (g)	40 __ __ __ __
Net Wt (g)	44 __ __ __ __
Unit Cost ($/kg)	48 __ __,__ __
Origin	52 __

7. Fruits

Banana

Gross Wt (g)	1 __ __ __ __
Net Wt (g)	5 __ __ __ __
Unit Cost ($/kg)	9 __ __,__ __
Origin	13 __

Citrus

Gross Wt (g)	14 __ __ __ __
Net Wt (g)	18 __ __ __ __
Unit Cost ($/kg)	22 __ __,__ __
Origin	26 __

Other (specify)

. _____ 24 __ __

Gross Wt (g)	26 __ __ __ __
Net Wt (g)	30 __ __ __ __
Unit Cost ($/kg)	34 __ __,__ __
Origin	38 __

. _____ 39 __ __

Gross Wt (g)	41 __ __ __ __
Net Wt (g)	45 __ __ __ __
Unit Cost ($/kg)	49 __ __,__ __
Origin	53 __

. _____ 54 __ __

Gross Wt (g)	56 __ __ __ __
Net Wt (g)	60 __ __ __ __
Unit Cost ($/kg)	64 __ __,__ __
Origin	68 __

7. Fruits

• _____		1 __ __
	Gross Wt (g)	3 __ __ __ __
	Net Wt (g)	7 __ __ __ __
	Unit Cost ($/kg)	11 __ __,__ __
	Origin	15 __
• _____		16 __ __
	Gross Wt (g)	18 __ __ __ __
	Net Wt (g)	22 __ __ __ __
	Unit Cost ($/kg)	26 __ __,__ __
	Origin	30 __
• _____		31 __ __
	Gross Wt (g)	33 __ __ __ __
	Net Wt (g)	37 __ __ __ __
	Unit Cost ($/kg)	41 __ __,__ __
	Origin	45 __
• _____		46 __ __
	Gross Wt (g)	48 __ __ __ __
	Net Wt (g)	52 __ __ __ __
	Unit Cost ($/kg)	56 __ __,__ __
	Origin	60 __

8. Meat

Beef

Gross Wt (g)	1 __ __ __ __
Net Wt (g)	5 __ __ __ __
Unit Cost ($/kg)	9 __ __,__ __
Origin	13 __

Pork

Gross Wt (g)	14 __ __ __ __
Net Wt (g)	18 __ __ __ __
Unit Cost ($/kg)	22 __ __,__ __
Origin	26 __

Goat Meat

Gross Wt (g)	27 __ __ __ __
Net Wt (g)	31 __ __ __ __
Unit Cost ($/kg)	35 __ __,__ __
Origin	39 __

Jerky (different types)

Gross Wt (g)	40 __ __ __ __
Net Wt (g)	44 __ __ __ __
Unit Cost ($/kg)	48 __ __,__ __
Origin	52 __

Poultry

Gross Wt (g)	53 __ __ __ __
Net Wt (g)	57 __ __ __ __
Unit Cost ($/kg)	63 __ __,__ __
Origin	69 __

8. Meat

Viscera in general

Gross Wt (g)	1	__ __ __ __
Net Wt (g)	5	__ __ __ __
Unit Cost ($/kg)	9	__ __,__ __
Origin	13	__

Fish

Gross Wt (g)	14	__ __ __ __
Net Wt (g)	18	__ __ __ __
Unit Cost ($/kg)	22	__ __,__ __
Origin	26	__

Pressed Meats ("linguica," salami, bologna, etc.)

Gross Wt (g)	27	__ __ __ __
Net Wt (g)	31	__ __ __ __
Unit Cost ($/kg)	35	__ __,__ __
Origin	39	__

Other

_____	40	__ __
Gross Wt (g)	42	__ __ __ __
Net Wt (g)	46	__ __ __ __
Unit Cost ($/kg)	50	__ __,__ __
Origin	54	__

9. Eggs, Milk, Cheese

Eggs	Gross Wt (g)	1 __ __ __ __
	Net Wt (g)	5 __ __ __ __
	Unit Cost ($/dozen)	9 __ __,__ __
	Origin	13 __
Fresh &/or Pasteurized Milk	Net Wt (g)	14 __ __ __ __
	Unit Cost ($/l)	18 __ __,__ __
	Origin	22 __
Powdered Milk	Net Wt (g)	23 __ __ __ __
	Unit Cost ($/kg)	27 __ __,__ __
	Origin	31 __

10. Beverages

Alcoholic	Net Wt (g)	32 __ __ __ __
	Unit Cost ($/l)	36 __ __,__ __
	Origin	40 __
Cold drinks	Net Wt (g)	41 __ __ __ __
	Unit Cost ($/l)	45 __ __,__ __
	Origin	49 __
Home-made fruit juices	Net Wt (g)	50 __ __ __ __
	Unit Cost ($/l)	54 __ __,__ __
	Origin	58 __
Coffee	Net Wt (g)	59 __ __ __ __
	Unit Cost ($/l)	63 __ __,__ __
	Origin	67 __

No. of persons in the family 68 __ __

11. Other Foods

. _____ 1 __ __

Gross Wt (g) 3 __ __ __ __

Net Wt (g) 7 __ __ __ __

Unit Cost ($/kg) 11 __ __,__ __

Origin 15 __

. _____ 16 __ __

Gross Wt (g) 18 __ __ __ __

Net Wt (g) 22 __ __ __ __

Unit Cost ($/kg) 26 __ __,__ __

Origin 30 __

. _____ 31 __ __

Gross Wt (g) 33 __ __ __ __

Net Wt (g) 37 __ __ __ __

Unit Cost ($/kg) 41 __ __,__ __

Origin 45 __

. _____ 46 __ __

Gross Wt (g) 48 __ __ __ __

Net Wt (g) 52 __ __ __ __

Unit Cost ($/kg) 56 __ __,__ __

Origin 60 __

11. Other Foods

• _____		1 __ __
	Gross Wt (g)	3 __ __ __ __
	Net Wt (g)	7 __ __ __ __
	Unit Cost ($/kg)	11 __ __,__ __
	Origin	15 __
• _____		16 __ __
	Gross Wt (g)	18 __ __ __ __
	Net Wt (g)	22 __ __ __ __
	Unit Cost ($/kg)	26 __ __,__ __
	Origin	30 __
• _____		31 __ __
	Gross Wt (g)	33 __ __ __ __
	Net Wt (g)	37 __ __ __ __
	Unit Cost ($/kg)	41 __ __,__ __
	Origin	45 __
• _____		46 __ __
	Gross Wt (g)	48 __ __ __ __
	Net Wt (g)	52 __ __ __ __
	Unit Cost ($/kg)	56 __ __,__ __
	Origin	60 __

12. Family Composition

Interviewee (sex, age)		1 __ 2 __ __
Spouse (sex, age)		4 __ 5 __ __
Children		
. _____	(sex, age)	7 __ 8 __ __
. _____	(sex, age)	10 __ 11 __ __
. _____	(sex, age)	13 __ 14 __ __
. _____	(sex, age)	16 __ 17 __ __
. _____	(sex, age)	19 __ 20 __ __
. _____	(sex, age)	22 __ 23 __ __
. _____	(sex, age)	25 __ 26 __ __
. _____	(sex, age)	28 __ 29 __ __
. _____	(sex, age)	31 __ 32 __ __
. _____	(sex, age)	34 __ 35 __ __
. _____	(sex, age)	37 __ 38 __ __
. _____	(sex, age)	40 __ 41 __ __
. _____	(sex, age)	43 __ 44 __ __
. _____	(sex, age)	46 __ 47 __ __
. _____	(sex, age)	49 __ 50 __ __
. _____	(sex, age)	52 __ 53 __ __
. _____	(sex, age)	55 __ 56 __ __
. _____	(sex, age)	58 __ 59 __ __
. _____	(sex, age)	61 __ 62 __ __
. _____	(sex, age)	64 __ 65 __ __
. _____	(sex, age)	67 __ 68 __ __

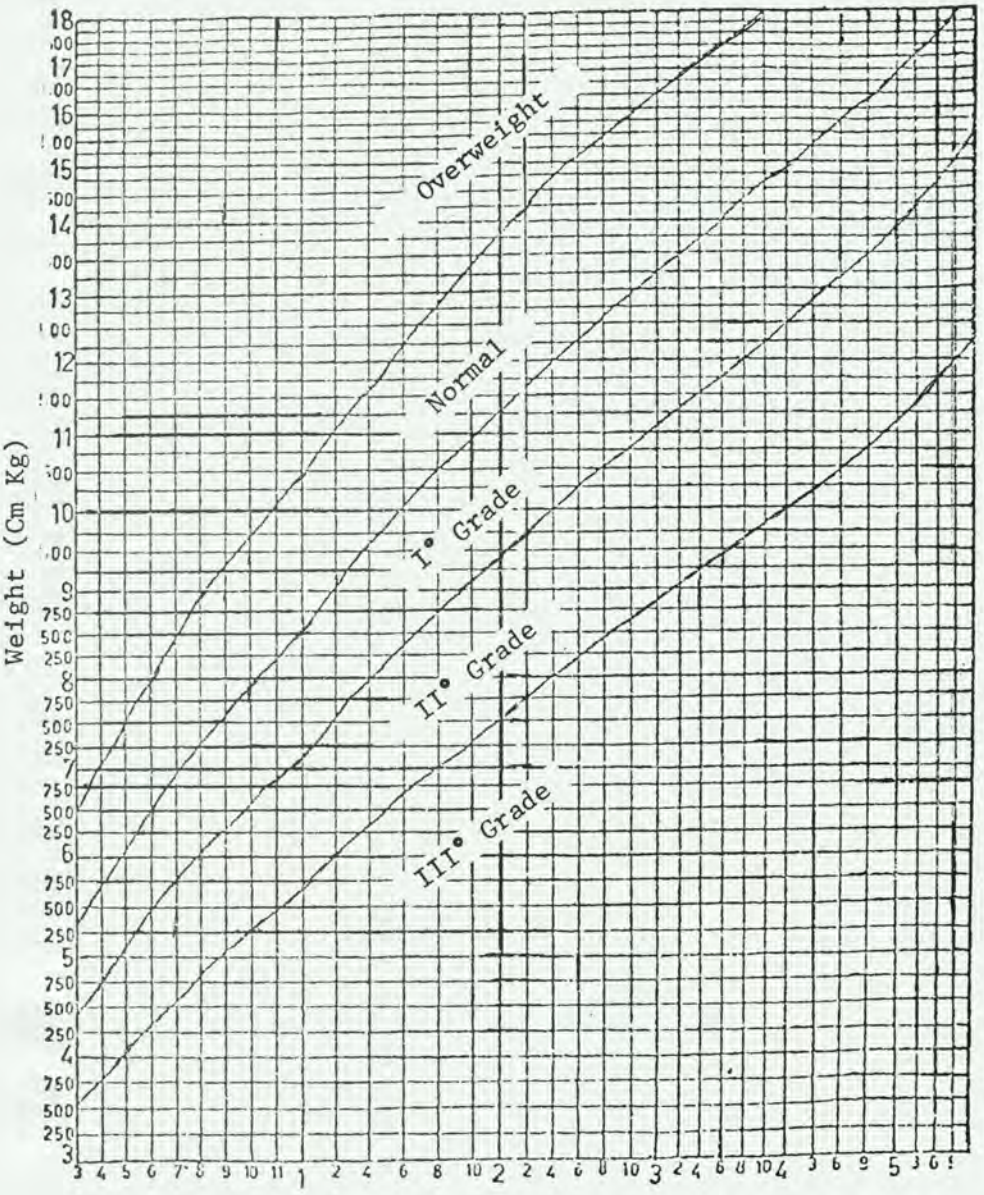
APPENDIX 5
Page 1

CLASSIFICATION OF NUTRITIONAL STATUS,

BASED ON NORMAL GROWTH CURVES FOR CHILDREN

FIGURE 1

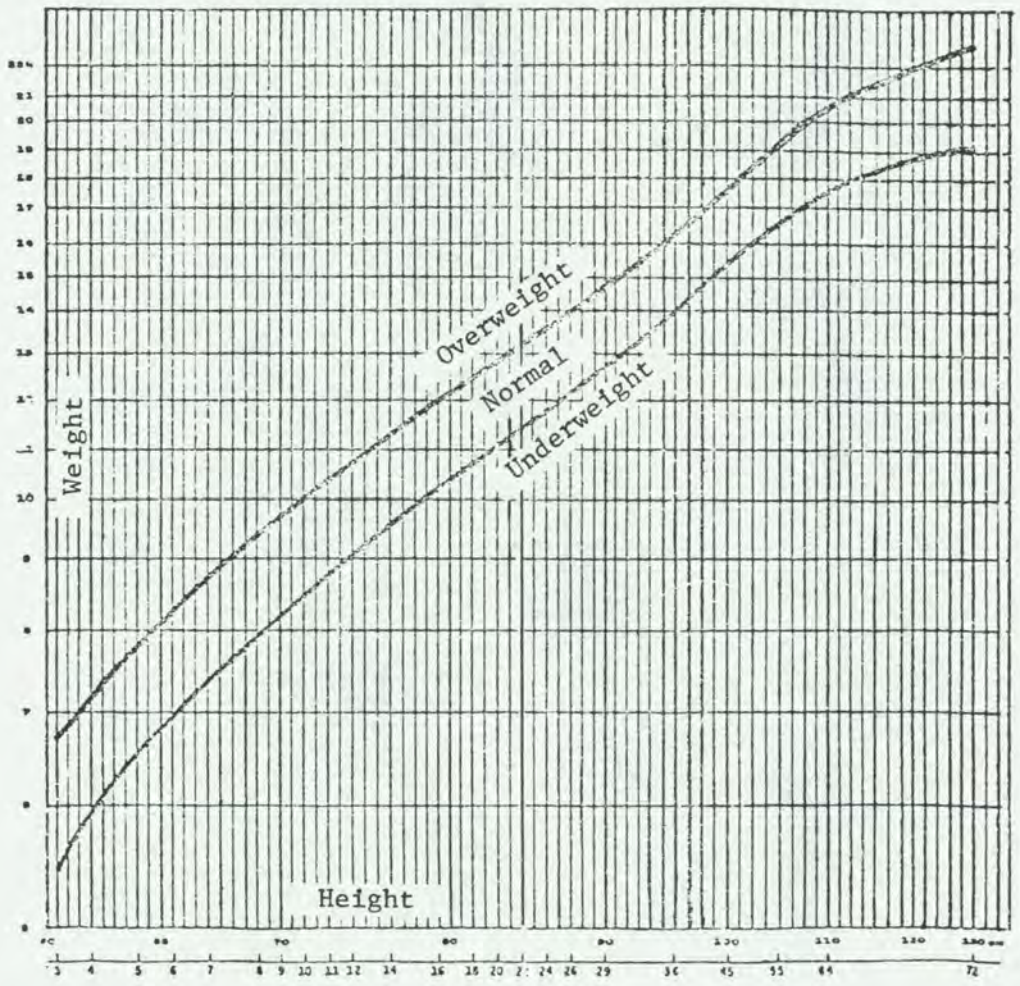
Classification of Nutritional Status
Based on Weight/Age Relationship in
Female Children Less Than 6 Years of Age



Footnote: Figure elaborated by INAN based on the Gomez classification of Social Class IV of the Table of Marcondes; from "Atendimento Ao Pre-Escolar," (Part 2, Page 81) Ministry of Education and Culture, Brazil.

FIGURE 3

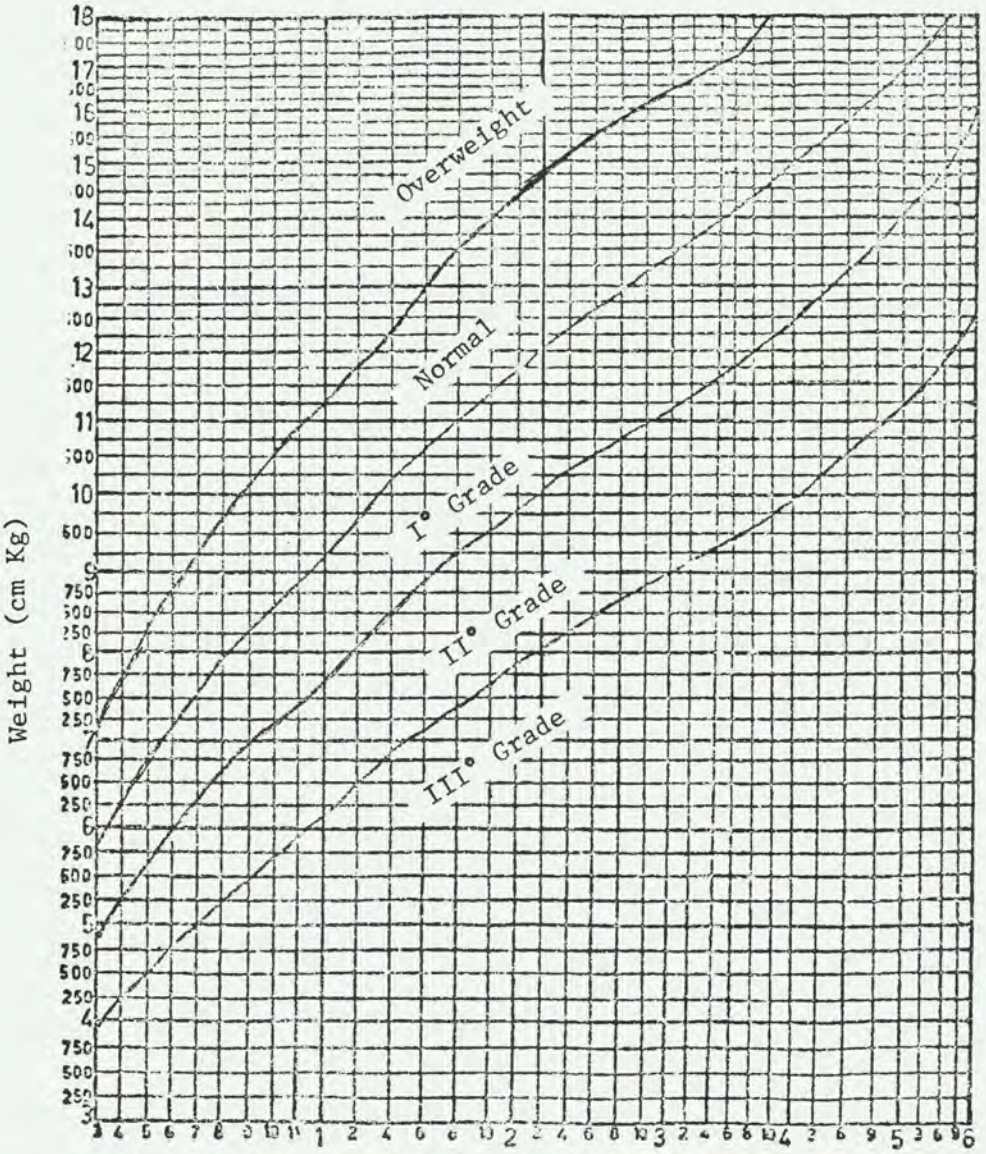
Evaluation of Nutritional Status
Based on Weight/Height Replationship in
Children Above 6 Years of Age



Footnote: Figure elaborated by INAN based on the Gomez classification of Social Class IV of the Table of Marcondes; from "Atendimento Ao Pre-Escolar," (Part 2, Page 85) Ministry of Education and Culture, Brazil.

FIGURE 2

Classification of Nutritional Status
Based on Weight/Age Relationship in
Male Children Less Than 6 Years of Age



Footnote: Figure elaborated by INAN based on the Gomez classification of Social Class IV of the Table of Marcondes; from "Atendimento Ao Pre-Escolar," (Part 2, Page 83) Ministry of Education and Culture, Brazil.

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IBRD 12183R
JUNE 1978

PENELITIAN MONITORING DAN EVALUASI TRANSMIGRASI
INSTITUT PERTANIAN BOGOR
Jalan Raya Pajajaran, Bogor Tilp. Bo. 181, Ps. 57-58

July 13 , 1978

Dr. Gloria Davis
c/o HILTON HOTEL
Senayan , Jakarta Selatan

Dear Dr. Davis,

This is to inform you that reservations have been made for your stay in Bogor at the Kebun Raya Guesthouse from 18 July through 23 July(check out time is rather flexible). If you want to get to the guesthouse first immediately after arrival please take the entrance gate of Kebun Raya closest to Pasar Bogor (along the Jl. Perniagaan).

Attached to this letter is the time schedule for the MET,IPB Team meetings. Prof.Sajogyo(only partly available now) has not made a decision with regard to the meetings with Forum Transmigrasi IPB and our Lembaga Penelitian Sosiologi Pedesaan. Also Dr.R.S.Sinaga(SAE, Rural Dynamic Study and Irrigation monitoring) has been informed about your presence in Bogor next week so that he can also indicate if more meetings have to be arranged.

I am taking the freedom to 'manage' your time schedule while in Bogor.

Looking forward to meeting you here for more intensive discussions.

Yours sincerely,

Sediono M.P.Tjondronegoro

PENELITIAN MONITORING DAN EVALUASI TRANSMIGRASI
INSTITUT PERTANIAN BOGOR
Jalan Raya Pajajaran, Bogor Tilp. Bo. 181, Ps. 57-58

Nomor : 07/1/MET/78
Lampiran :
Perihal : Undangan.

BOGOR, 13 Juli 1978

Kepada
Yth.,
Anggauta Team MET, I.P.B.
c/o Departemen Sosek.

Dengan ini kami undang Anda untuk makan siang dengan Dr. Gloria Davis (Consultant IBRD) pada

Hari : Selasa
Tanggal : 18 Juli 1978
Pukul : 13.00 - 14.00 WIB.
Tempat : Ruang Diskusi Departemen Sosek.

Sesudah makan siang ada rapat Team lengkap dengan tamu tersebut diatas (pukul 14.00-17.00 WIB).

Selain dari pada itu akan diadakan pertemuan terpisah dengan penanggung-jawab2 Subteam masing-masing dengan jadwal sebagai berikut :

1.	Rabu 19 Juli	Baseline Data	(Dr. Irlan Soejono)	8.30-11.30
2.	Rabu 19 Juli	Adaptation	(Ir. W. Hardjanto)	17.00-20.00
3.	Kamis 20 Juli	Leadership & Institutions	(Dr. Amin Aziz)	8.00-11.00
4.	Kamis 20 Juli	Marketing	(Drs. Z.Azzaino MSC)	17.00-20.00
5.	Kamis 20 Juli (?)	Regional Development	(Dr. A. Anwar)	14.00-17.00
6.	Jumat 21 Juli (tentatif)	Team lengkap		17.00-20.00

Tempatnya pertemuan sub-tema menurut perjanjian masing-masing yang dibuat hari Selasa.

Oleh karena Dr. G. Davis mengharapkan diskusi yang mendalam minggu depan, kami mohon waktu benar-benar diluangkan untuk memenuhi janji.

Atas itu kami ucapkan banyak terima kasih.

Sediono M.P. Tjondronegoro
Ketua Team M.E.T.

December 8, 1978

TO: N.D. Abdul Hameed

FROM: Gloria Davis

Re: Transmigration Training Proposal

I have just read with pleasure Ingrid Janelid's Guidelines for Identification of training needs of members of rural households. I also understand from Colin that you will remain in Indonesia and that Colin may be helping you? I hope both of these are true. At any rate I write only to tell you how pleased I am both with Ingrid's recommendations and with the notion that you as a representative of FAO would be involved with the work that has been proposed.

Our appraisal report has just been rewritten though it may very well have to be done again if the proposal to clear only 1.25 ha holds. At any rate I don't imagine that I will be in Indonesia prior to the end of January but I certainly hope to see you then. Since we do not get FAO documents directly I hope you will send us information on transmigrant and staff training and I'll be glad to reciprocate with whatever documents can be released. I will try to forward the sketchy proposal for monitoring and evaluation (as it appears in the appraisal report) as soon as possible and look forward to your reactions. Again, I'm delighted with your work on behalf of transmigration.

Warm regards,

Gloria Davis

A number of issues are being debated which affect Bank sponsored transmigration activities. Putting aside for a moment, the fundamental problem of food crops v. cash crops, most of these debates center around the problem of what should be provided and at what cost.

e.g. 1. Should land be cleared by heavy machinery or local labor?

2. How much of the land should be cleared? House lots? Food crop areas. Fields for cash crops?

3. Should migrants be settled on fully improved land or should they be expected to develop it themselves?

4. Do migrants need a full complement of extension services or can they teach one another?

5. Should migrants receive completed houses? If so, of what kind and quality?

6. What about essential and semi-essential institutions, health clinics, schools, religious structures etc. Who is to provide them? of what quality? In what numbers?

7. Finally, what is the importance of replicability? Must these programs be designed in such a way that they could continue without on-going bank support?

The correct decision on each of these issues is crucial to transmigrant success. Yet these questions put in this way seem to place the cart before the horse. The answer to everyone of these questions depends on knowing at what point in the settlement process a particular group of migrants will arrive.

Early migrants need the most help. They need land which is cleared and developed to get the most rapid start possible. They need massive assistance in obtaining supplies (fertilizers, seeds, food) and services (health, extension, etc) as they will have no community to provide back-up support. Intermediate stage communities can be started using a pre-existing labor pool, administrative services and early surpluses; while the growth of later communities may be possible with a minimum amount of government support. Unfortunately, however, our cookie-cutter philosophy ① of settlement ignores and frequently interfers with the normal migration process. Modest assistance to early communities jeopardizes their viability and future growth; while the same degree of assistance to later communities can be redundant and wasteful.

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① Should you doubt that this is, in fact, current practice See the settlement plans for Pematang Panggang and Sinaut, p. 9

For all of these reasons it is necessary to develop a perspective which will place particular communities within an ongoing settlement strategy -- a strategy which acknowledges and builds upon the problems and potentials inherent in the settlement process.

This brief statement is intended as a means of opening discussion on the need for and nature of such a settlement strategy (TRANSPROGRAM). It begins by building a model which illustrates the stages of development

- within settlements
- within projects (Singkur, Wai Abung, etc)
- within the geographical area of which the settlements are a part

It then asks whether this model helps us to address the problems of page one. It further asks whether the answers we get from this model are sounder and simpler than those we get using a piecemeal approach. Finally the paper refocuses on what we still need to know to use the model and it suggests what I see as my part in finding the answers.

The Stages of Settlement

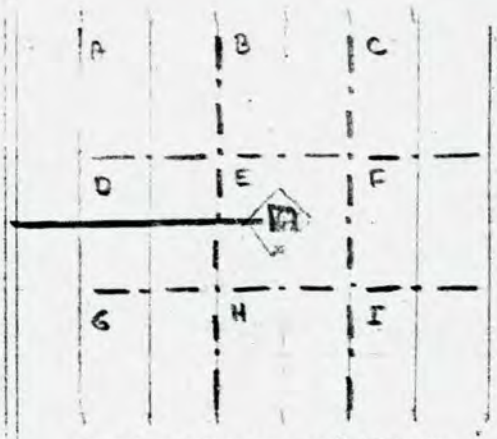
The overall strategy presented in the next few pages assumes that the GOI wishes to facilitate migration and that it wishes to do so as efficiently and economically as possible. It argues:

1. that infusions of capital & machinery (for road clearing and land development) are most important in the early communities and their importance then decreases over time.
2. that the need for support, supplies and services is also most crucial in the earliest communities and lessens over time.

The model assumes both that it will take a relatively large amount of money to settle relatively few migrants in the first few years and that successive waves of migrants can be settled at decreasing expense, thus greatly reducing the perceived per capita cost of settlement.

The arbitrary model presented in the following Section is based on the assumption of a 50,000 ha site, 20% unusable. In this model each migrant received 4.0 ha (0.5 for a homelot, 1.0 for gardens and 2.5 for food or cash crops). A 5.0 ha model would require only minor modifications in the general plan. (The village plan is given in Appendix B)

A. Stages of Growth Within the Settlement



A → I = villages of 100 KK
400 ha

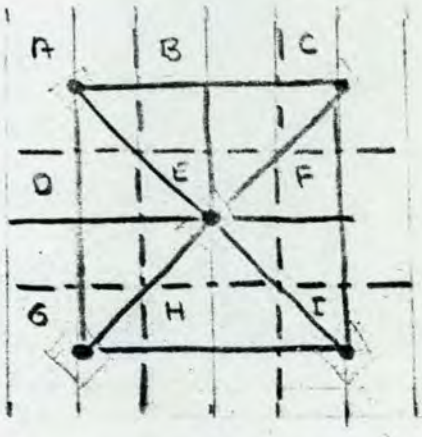
See appendix B for description

Stage I

1. Heavy machinery used to construct a road into the nucleus village
2. H.M used to clear the core of the nucleus village and build barracks for construction workers and agriculturalists.
3. Adjacent to the core area trial fields and seedling plots are established. These will provide:
   a. trials for appropriate cash crops
   b. trials for appropriate fertilization
   c. demostration fields for teaching mig.
   d. seedlings
4. H.M used to clear house lots and garden areas in nucleus village (1.5 ha x 100)
   - contractors spread rock phosphate, fertilizer & (?) cover crop

Stage II

1. Heavy machinery used to carve out all roads (including those to areas which will not be immediately filled.
2. H.M clears house & garden lots for 75 KK in each corner village (1/4 of each of these villages will be left for non-sponsored mig? or normal population growth)
3. Contractors build barracks, stock supplies in corner villages

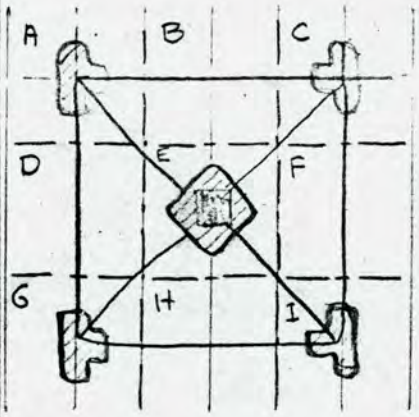


4. Contractors build barracks, stock supplies in nucleus village clinic, market and administration buildings erected in nucleus settlement
5. 400 migrant families (100KK at center) (75 x 4 KK in corners) arrive, settle, begin building houses (this should occur at beginning of dry season
6. H.M. carves out houselots (only) in side villages (B, D, F, H) Heavy machinery departs.

Stage III

1. When surpluses are being produced villages B, D, F, H will be opened to semi-sponsored migrants (ideally, these would be from the same villages in Java the original migrants were from
2. These migrants will probably be provided transport, tools and a small stipend to hire labor for land clearing and house construction

B. Phases of Growth Within the Project



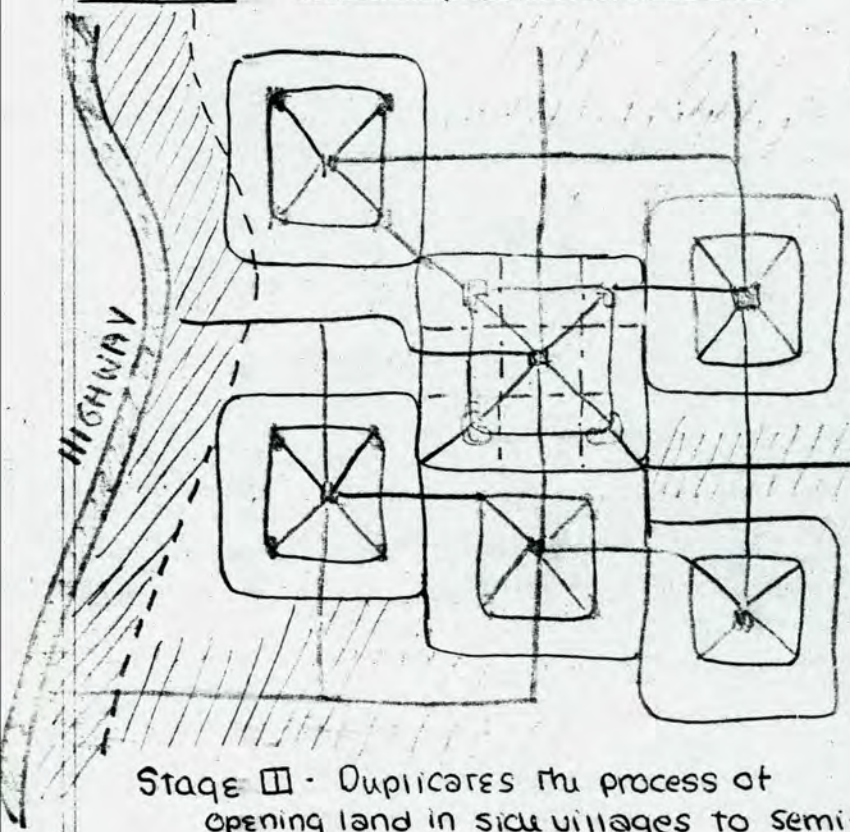
Phase I - Establishing the Nucleus Settlement
(see preceeding page)

Stages I & II

Involves land clearing and settlement of 400 KK (this may be done in several areas). The advantage of a relatively small number of settlers (2,000) in the first wave is in not straining the capacity for providing adequate administration services and supplies (NOTE: 100 spaces 20% reserved for pop growth)

Stage III - may occur at the same time (or later) than Phase II

Phase II - The Peripheral Settlements



Stages I - II

1. Heavy equipment moves from the nucleus settlement and clears all roads (depending on the lay of the land) in peripheral settlements and homestead areas.
2. It then clears house and garden lots in the five peripheral settlements. Land is fertilized, plowed.
3. Barracks constructed and supplies stockpiled for 400 KK in each settlement (see Stage II, Phase I)
4. 2,000 KK (10,000 people) are settled, provided with tools & supplies

Stage III - Duplicates the process of opening land in side villages to semi-sponsored migrants (Phase I, Stage III

Phase III - Homesteading

Homesteaders receive land grants of 4 (5) ha contingent on development. They can also obtain (at cost) seedlings, supplies, instruction and credit from institutions within the project. They are to be considered an integral part of the settlement process.

Numbers settled

2400 KK	fully sponsored
3000 KK	semi- or nonspon
2600 KK	Homesteaders
8000 KK	(40,000 people)

on 4 ha = 32,000 ha
on 5 ha = 40,000 ha

C. Co-ordinating Growth within a Geographical Area

	Year	1	2	3	4	5	6	7	8	9	10
Project I	Nucleus Settlement	area prep	400	—	—	150ss #	150ss		(200) ##		
	Peripheral Settlement		area prep	2,000	—	750ss	750ss		(1000)		
	Homestead			area prep	100h	200h	300h	500h	500h	500h	500h
II	Nucleus		area prep	400	—	—	150ss	150ss	(200) ##		
	Peripheral			area prep	2,000	—	750ss	750ss	(1000)		
	Homestead				area prep	100h	200h	300h	500h	500h	(1000h)
III	Nucleus			area prep	400	—	—	1300ss			(200) ##
	Peripheral				area prep	2,000	—	1500ss			(1000)
	Homestead					area prep	100h	200h	300h	500h	500h (1000h)
	KK fully sponsored	400		2400	2400	2000	—	—	—		
	Semi Sponsored	-		—	—	900	1800	2000			
	homesteaders	-		—	100	300	600	1000	1300	1500	2,000
	Total KK	400		2400 (1)	2500 (2)	3200 (3)	2400 (4)	3000 (5)	1300	1500	2000

normal growth of families (2400) ← | 1000 | 3400

Total = 24,000 or 120,000 people in 3 project areas in 10 years
(Any number of geographic areas could be choosen for development)
The main thrust in settlement occurs in years 3-6 (5 year plan)

Only 75 of 100 spaces taken in each village, allows for normal population growth and the division of mature families

The Strategy and Its advantages

1. Provides medium range planning and co-ordination and the building blocks of a general strategy of settlement
2. Does not make unrealistic assumptions about the capacity of administrators & infrastructure in the early stages of the project. Allows phased expansion of communities and services
3. Allows for the effective and expanding use of heavy machinery and then a gradual shift to available labor
4. By waiting for and building on early communities, decreases migrant risk
5. Does not overfill migrant areas
   - reserves 20% of land within settlements for family division & pop growth
   - provides nearly 1/2 of settlements for semi-sponsored relatives & friends
   - provides for homesteading and services for both locals & Javanese

The problem which pervades this model is establishing what this "natural" settlement cycle is and pegging the proposes phases to it. Some of the information we need can be culled from reports in the office, but other aspects of the data remain to be discovered or checked in the field. Below, I have listed some of the questions which I would like to be able to answer from reading and site visits.

1. What is the average amount of time it takes for migrants to become self-sufficient in food under different conditions of clearing and support?
   a. What variables distinguish successful and unsuccessful communities?
   b. How do the migrants themselves rate the importance of
      1) amount of land cleared
      2) quality with which land is cleared
      3) degree of land development
      4) provision of fertilizer, draft animals
      5) construction of houses
      6) ancillary services, etc.
2. At what stages in the development cycle do migrants feel the most critical labor shortage.
3. At what point would migrants be willing to support relatives in return for labor? What percent of migrants would be willing to do so?
4. What incentives (transport? land? cleared land) would induce non-sponsored migrants to move?
5. In areas that have shown population growth, is cycling related to labor shortage? What other variables might account for differential growth?
6. What policies facilitate or discourage non-sponsored growth?
7. What is the current attitude of GOI and DGT on semi-sponsored and non-sponsored movement? How did this attitude come about?
8. DGT has communities with areas reserved for unsponsored growth. How have these worked out?
9. What type of monitoring and evaluation is being done to distinguish the significant and non-significant variables.
10. What type of evaluation can be done to provide us with the information we need to make reasonable decisions in the future?

Problems with Potential Answers

1. Should the land be cleared by heavy machinery or local labor?
   Heavy machinery is necessary in initial stages.
   It should be used for carrying out all roads.
   In later stages it may be used for special tasks (destumping).
   but it need not be used where there is a willing labor pool.

2. How much of the land should be cleared?
   Initially, the more cleared land that can be provided the better. Early migrants do not have a fall back position and need to be given the most rapid possible start. Later migrants can use the labor of relatives and friends (experience has shown that later migrants are also more likely to arrive with working capital than earlier ones).

3-4. Should migrants be settled on fully developed land?
   Initially, yes. This follows from answer # 2. In addition, early migrants require external sources of seeds, seedlings and agricultural know-how. These will be provided by experienced pioneers.

5 Should migrants receive completed houses?
   Our working assumption has been no. If land is cleared, house construction is not unrealistic.

6. What about clinics, schools, markets, etc?
   In phased development the core structures can be built in the nucleus community with contract labor. Peripheral settlements can use the resources of the core community as they become established.

7. What about Replicability?
   One interesting thing about this model is that not all phases need to be replicated. The Bank might, for example, choose to finance certain aspects of the model, e.g. roads and land clearing in order to seed communities in appropriate places. DGT might then be requested to provide other services from other sources.

Answers with Potential Problems

An overall strategy should involve the use of Landsat / Comarc to locate appropriate areas for settlement. A plan should then be drawn up in which settlement and costs are phased over a relatively long period, using as a guide the normal process of settlement growth

Finding our this information seems to have three components

1. Discussing the transmigration position with people in Jakarta (DGT, Weiden) and Jogya (MacAndrews)

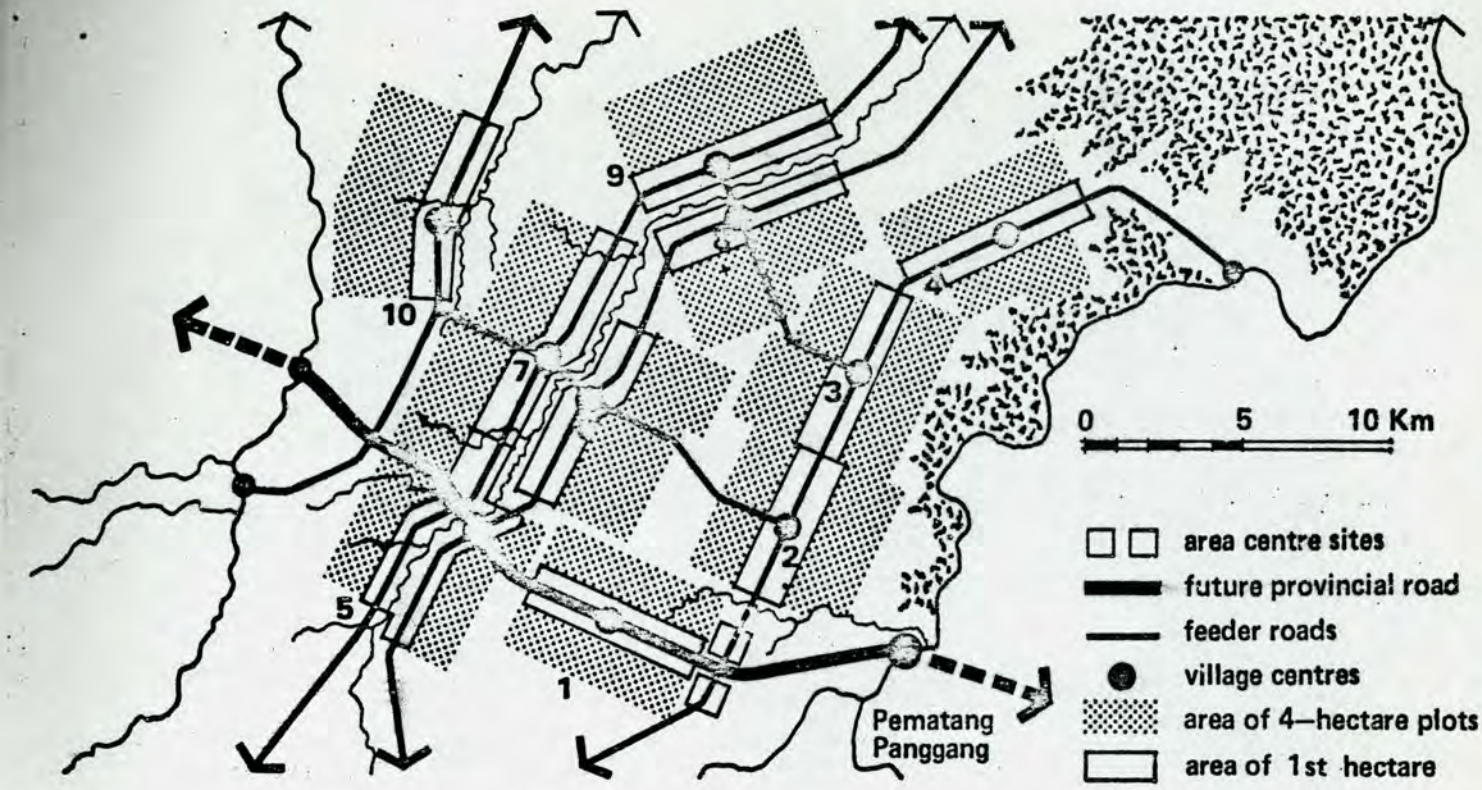
2. Contrasting areas of growth and non-growth, investigating why this occurred and how growth can be facilitated. (The P.A. Management report <u>might</u> provide a start in identifying appropriate areas.

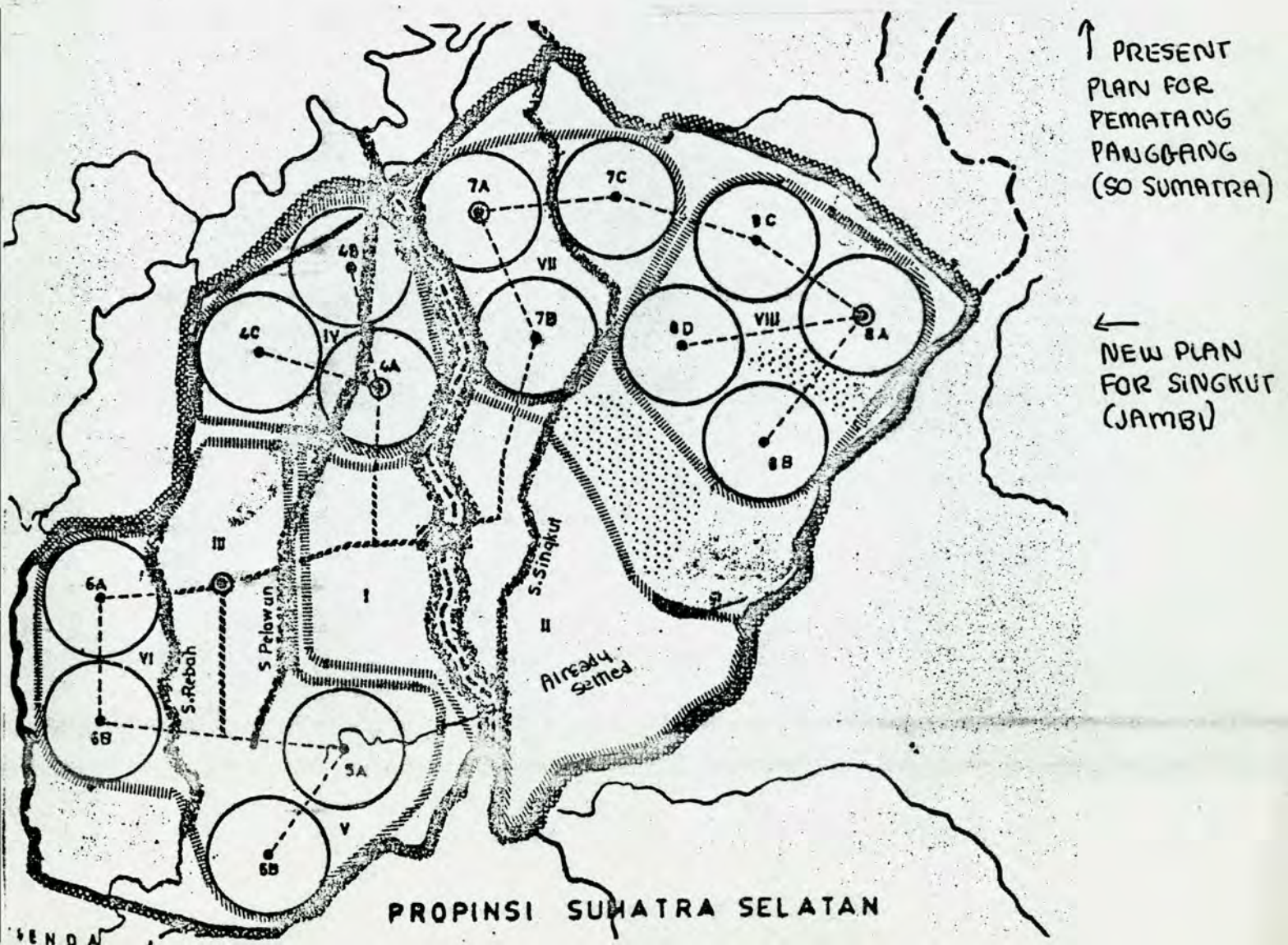
3. Working with farmers to find our:
   a. How they are doing
   b. What they perceive as the trade-offs in the settlement process
   c. To what degree they are interested in promoting semi-sponsored growth.

To this end I have prepared a hurried itinerary for the field: Suggestions on additional areas where I might provide a contribution would be more than welcome

Feb	6	Discussions with DGT officials interested in Semi-sponsored growth (my dissertation might provide a foot in the door).
		Trip to Jogya to see MacAndrews
	13-15	Padang - Bukittinggi - ODM Read, discuss Jambi
	16 -	to Rimbobujang 10-14 days exploring Rimbobujang, Sitrung Siat Jujuhan and Alai Hilir
	27	If possible proceed to Singkur 3-5 days talking to farmers there
March	3	Jambi (Appointments at Jakarta Hilton anyone?)
	5	Palembang - Belitang (?)5 days each in Pematang Panggang Wai Abung, Batu Raja
	?25	Return to Jakarta
April	1	Return to Washington

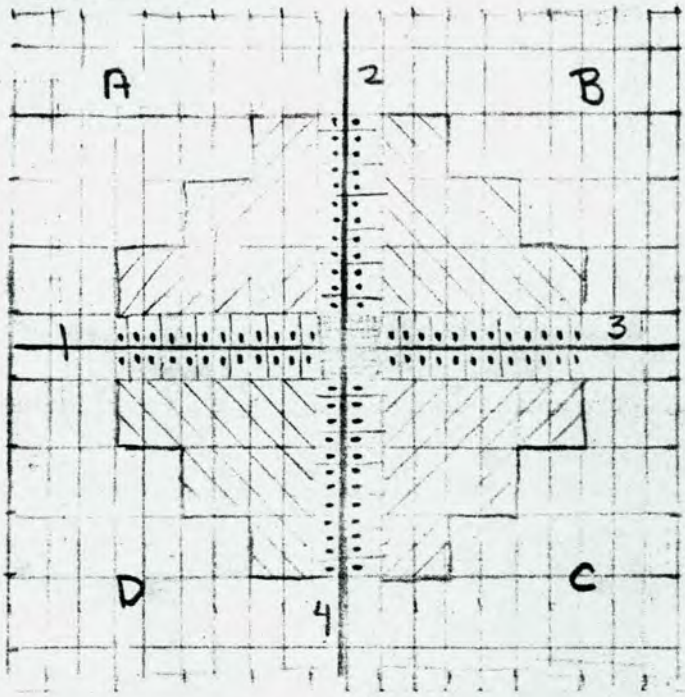
APPENDIX A - THE COOKIE-CUTTER APPROACH





Appendix A

The Village



The building blocks of the settlement pattern consist of villages which include four dukuhs of 24 families each

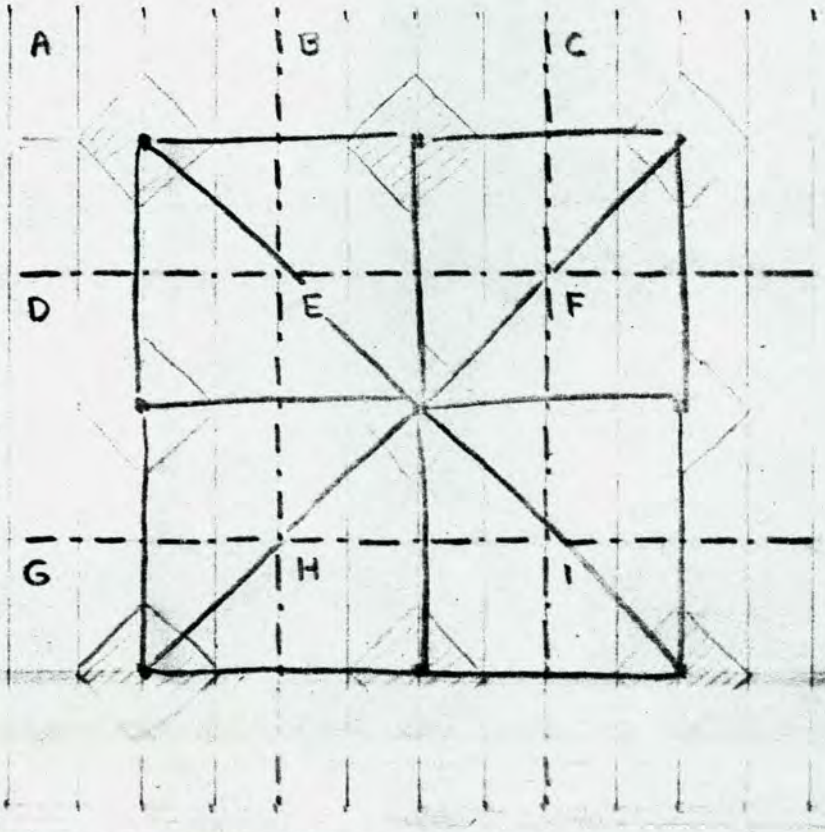
Block B, for example, includes:

1 component of the village center	1 ha
24 0.5 ha houselots	12 ha
24 1.0 ha garden lots	24 ha
24 2.5 ha lots for food or cash crops	60 ha
total	97 ha

(figured in estimates as 100ha)

The total village therefore includes 96 (100) families and 388 (400) ha

The Settlement



One settlement consists of nine villages

As the next pages indicate, the nucleus village (E) and the corner villages (A, C, G, I) are started by fully sponsored transmigrants the side villages (B, D, F, H) are populated by semi-sponsored migrants or homesteaders①

The settlement therefore includes HH (Households)

400 fully sponsored HH.
500 semi-sponsored or non-sponsored① HH

900 KK on 3600 ha

Roads

20 km on perimeter
10 km to sides
12 km on diagonals
42 km

① This term is used in preference to "spontaneous" to acknowledge that these migrants can settle only where pre existing support systems (roads, surveys) exist.